SPACE/TIME
PLACE/DURATION

Council of Educators in Landscape Architecture
Conference Proceedings
Austin, Texas USA
March 27-30, 2013

Hosted by
School of Architecture
The University of Texas at Austin

Edited by
Ming-Han Li, PhD, PLA, PE, Editor
Hyun Woo Kim, Editorial Assistant
Texas A&M University
Acknowledgments

Conference Host and Planning Committee:
Landscape Architecture Program
The University of Texas at Austin

Conference Chair: Allan W. Shearer  
ashearer@austin.utexas.edu
Conference Administrator: Nelly Fuentes  
nelly.fuentes@utexas.edu
Host Committee: Hope H. Hasbrouck  
hasilbrouck@austin.utexas.edu
Host Committee: Jason Sowell  
jsowell@austin.utexas.edu

CELA Conference Planning Committee:
Patrick Mooney, University of British Columbia  
ammu@salu.ubc.ca
Ming-Han Li, Texas A&M University  
minghan@tamu.edu
Sean Michael, Utah State University  
sean.michael@usu.edu
Pat Taylor, University of Texas at Arlington  
pdt@uta.edu
Christopher Ellis, University of Maryland  
cdellis@umd.edu

CELA Conference Staff:
Dee Solco, Business Manager  
dsolco@uta.edu

Track Chairs:
Communication & Visualization  
Art Rice  
art_rice@ncsu.edu
Kevin Thompson  
gday@ufl.edu
Design Education & Pedagogy  
Terry Clements  
tclement@vt.edu
Design Implementation  
Margie Borecki  
margie.borecki@usu.edu
Bo Yang  
bo.yang@usu.edu
History, Theory & Culture  
Elizabeth Brabec  
ebrabec@larp.umass.edu
Landscape Planning & Ecology  
Charlene LeBleu  
LEBLECM@auburn.edu
People-Environment Relationships  
Lynne C. Manzo  
manzo@u.washington.edu
Research & Methods  
Kerry R. Brooks  
kerrybrooks@wsu.edu
Byoung-Suk Kweon  
kweonb@umd.edu
Service-Learning  
Paula Horrigan  
phh3@cornell.edu
& Community Engagement  
Cheryl Doble  
csdoble@syr.edu
Sustainability  
William A. Green  
wagre@ds.uri.edu
Mintai Kim  
mintkim@vt.edu
Urban Design  
Madis Pihlak  
mxp51@psu.edu
Abstract Reviewers:
Akers, Mary Anne  Clements, Terry  Hargrove, Ryan
Almy, Dean  Coffman, Reid  Hartman, JeanMarie
Arquero de Alarcon, Maria  Collett, Bradford  Heavers, Nathan
Ashby, Linda  Cook, Kelly  Hess-Reichard, Katie
Baas, Christopher  Corkery, Linda  Hill, Kristina
Barbarash, David  Cramer, Marianne  Hill, David
Bass, Beverly  Crankshaw, Ned  Hindle, Richard
Beidler, Kyle  Crawford, Katya  Hoefer, Wolfram
Belanger, Blake  Crawford, Pat  Hoffman, Denise
Bellalta, Maria  Curl, Kelly  Hohmann, Heidi
Benasconi, Claudia  Cushing, Debra  Holland, Martin
Billig, Noah  Dahl, Bernie  Horrigan, Paula
Blalock, Joe  Delcambre, Carla  Horton, Tobiah
Bohannon, CL  Deming, Elen  Hou, Jeff
Bose, Mallika  Deutsch, Barbara  John-Alder, Kathleen
Boult's, Elizabeth  Diaz-Montemayor, Gabriel  Johnson, Julie
Brabec, Elizabeth  Dieterlen, Susan  Keane, Tim
Bramlet, Alison  Doble, Cheryl  Keane, Tim
Brittenden, Judy  Dooling, Sarah  Kelley, Kristian
Britton, Jennifer  Dvorak, Bruce  Kew, Barry
Brooks, Kerry  Edstrom O’Hara, Christine  Kim, Mintai
Brooks, Kenneth  Ellis, Christopher  Kim, Jun-Hyun
Brzuszek, Robert  Erdman, Kimball  King, Maren
Bueno, Juan Antonio  Evans, Catherine  Komara, Ann
Burkholder, Sean  Famulari, Stevien  Koo, Tae Seo
Busserie, Simon  Fulford, Taze  Koo, Jayoung
Butler, Peter  Gallo, Katarzyna  Korostoff, Neil
Calabria, Jon  Gastil, Raymond  Krall, Daniel
Calabria, Ashley  George, Benjamin  Kweon, Byoung-Suk
Calorusso, Christine  Girling, Cynthia  Lamba, Baldev
Campbell, Angela  Gleason, Kathryn  Landman, Karen
Canfield, Jessica  Gong, Lingli  Langhorst, Joern
Chalana, Manish  Gordy, Matthew  Lara, Jesus J.
Chanse, Victoria  Green, Will  Lawson, Laura
Choi, Jane  Grese, Robert  LeBleu, Charlene
Christensen, Keith  Hamed, Safei  Lee, Brian
<table>
<thead>
<tr>
<th>Lee, Chanam</th>
<th>Palmer, James</th>
<th>Volkman, Nancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lee, Sang-Woo</td>
<td>Palmer, Joni</td>
<td>Voos, Paul</td>
</tr>
<tr>
<td>Li, Ming-Han</td>
<td>Payne Toft, Elizabeth</td>
<td>Walker, Jason</td>
</tr>
<tr>
<td>Li, Shujuan</td>
<td>Perron, P. Richard</td>
<td>Wang, Jin</td>
</tr>
<tr>
<td>Lickwar, Phoebe</td>
<td>Pihlak, Madis</td>
<td>Wasserman, Judith</td>
</tr>
<tr>
<td>Licon, Carlos</td>
<td>Pitt, David</td>
<td>Watts, David</td>
</tr>
<tr>
<td>Lindquist, Mark</td>
<td>Powers, Matthew</td>
<td>Webster, Brenda</td>
</tr>
<tr>
<td>Loheed, Patricia Schroeder</td>
<td>Queen, Sara</td>
<td>Wellborn Yates, Elizabeth</td>
</tr>
<tr>
<td>Lowery, Bryce</td>
<td>Ren, Lanbin</td>
<td>Whitham, Scott</td>
</tr>
<tr>
<td>Magallanes, Fernando</td>
<td>Retzlaff, Rebecca</td>
<td>Wilkerson, Wayne</td>
</tr>
<tr>
<td>Mainzer, Stephen</td>
<td>Ribe, Robert</td>
<td>Wilson Baptist, Karen</td>
</tr>
<tr>
<td>Manzo, Lynne</td>
<td>Rice, Arthur</td>
<td>Yang, Bo</td>
</tr>
<tr>
<td>Marlow, Christopher</td>
<td>Rolley, Stephanie</td>
<td>Yocom, Ken</td>
</tr>
<tr>
<td>Martin, Michael</td>
<td>Rotar, Sean</td>
<td>Yost, Bambi</td>
</tr>
<tr>
<td>Mccown, Ken</td>
<td>Ruggeri, Deni</td>
<td>Zhang, Bo</td>
</tr>
<tr>
<td>McCubbin, Mary Beth</td>
<td>Ryczewicz-Borecki, Malgorzata</td>
<td>Zhang, Qian</td>
</tr>
<tr>
<td>McGirr, Patricia</td>
<td>Sattler, Meredith</td>
<td>Zhou, Hongjun</td>
</tr>
<tr>
<td>McWilliam, Wendy</td>
<td>Sawhill, Ron</td>
<td></td>
</tr>
<tr>
<td>Melcher, Katherine</td>
<td>Scarfo, Bob</td>
<td></td>
</tr>
<tr>
<td>Miler, Patrick</td>
<td>Schauwecker, Timothy</td>
<td></td>
</tr>
<tr>
<td>Mills, Louis</td>
<td>Schroth, Olaf</td>
<td></td>
</tr>
<tr>
<td>Miniutti, Peter</td>
<td>Schwab, Kristin</td>
<td></td>
</tr>
<tr>
<td>Mogen, Elizabeth</td>
<td>Seymour, Michael</td>
<td></td>
</tr>
<tr>
<td>Mooney, Patrick</td>
<td>Sharma, Archana</td>
<td></td>
</tr>
<tr>
<td>Moore, Carrie</td>
<td>Sharma, Archana</td>
<td></td>
</tr>
<tr>
<td>Murphy, Michael</td>
<td>Shearer, Allan</td>
<td></td>
</tr>
<tr>
<td>Murtha, Timothy</td>
<td>Skabelund, Lee</td>
<td></td>
</tr>
<tr>
<td>Myers, Mary</td>
<td>Sleeegers, Frank</td>
<td></td>
</tr>
<tr>
<td>Myers, David</td>
<td>Smith, Carl</td>
<td></td>
</tr>
<tr>
<td>Nadenicek, Daniel</td>
<td>Stevens, Julie</td>
<td></td>
</tr>
<tr>
<td>Nelson, Holly Grace</td>
<td>Stilgenbauer, Judith</td>
<td></td>
</tr>
<tr>
<td>Nelson, Nicholas</td>
<td>Szczygiel, Bonj</td>
<td></td>
</tr>
<tr>
<td>Newman, Galen</td>
<td>Tang, Rennie</td>
<td></td>
</tr>
<tr>
<td>Oles, Thomas</td>
<td>Taylor, Melinda</td>
<td></td>
</tr>
<tr>
<td>O'Neal Dagg, Rebecca</td>
<td>Thompson, Kevin</td>
<td></td>
</tr>
<tr>
<td>Orland, Brian</td>
<td>Torres Bustamante, Cesar</td>
<td></td>
</tr>
<tr>
<td>Osborn, Brian</td>
<td>Tuccio, Christopher</td>
<td></td>
</tr>
<tr>
<td>Ozdil, Taner R.</td>
<td>Verma, Amitabh</td>
<td></td>
</tr>
</tbody>
</table>
# Table of Contents

**Acknowledgment** ........................................................................................................................................ ii

**Foreword** .................................................................................................................................................. xxi

**Communication & Visualization** .................................................................................................................. 1

10-Minute Map: Uncovering An Alternative Narrative for Nebraska's Oregon Trail Landscape ................. 2

Communication and Visualization of the Space-Time Dimensions of Landscape Themes ......................... 4

Confronting the Digital Divide .......................................................................................................................... 5

Digital Media in Landscape Architecture and Planning: Synchronizing Professional Demand and
Direction with Technology Curriculum ........................................................................................................ 7

Digital Poucháde: Design Thinking and the Influence of Media on Landscape Architecture ............. 8

Enhancing Design Portfolios: Transitioning to Professional Practice ...................................................... 9

Exploratory Physiocartographies of Place and Time ................................................................................... 10

FARMwork: Efficient, Productive, and Responsible Agricultural Systems ............................................. 11

Freehand Renaissance: Concept Sketching for a Digital Age ................................................................. 12

Games + Making + Learning: Landscape Architecture Revealed ............................................................ 13

Landscape as Iconography ............................................................................................................................ 14

Making Climate Change Visible: The Role of Landscape in Reframing Community Perceptions of
Climate Change and Carbon ...................................................................................................................... 15

Managing Uncertainty in the Design Process ............................................................................................ 16

Mapping the legacies of lost waterways in Chinatown, New York ........................................................ 17

Motion Pictures: Drawing While Moving ................................................................................................. 18

On "Floating and Falling:" ............................................................................................................................ 19

Reasserting the Temporal: Landscape Architecture and the Cinema ..................................................... 20

Representing Time and Space: DIY investigations .................................................................................. 21

Space, Time, Place, Duration: Geospatial Framing and Sensing Identities of Landscape Architects .... 22

The Impact of Sound on Environmental Experience: Do Multimodalities Improve Spatiotemporal
Landscape Understanding? ....................................................................................................................... 23

The Role of Visual Imaging in the Planning/Development Process for Three Wind Farms in Colorado:
Case Studies - Two Built One Denied ................................................................................................... 24

**Design Education & Pedagogy** .................................................................................................................. 25

A Paradigm Shift in Design Education: Harbeson and Albers in the Studio ........................................ 26
Achieving Excellence in Design Studio Teaching: A Panel Discussion ................................................................. 27
Amplifying Scope, Accentuating Sequence: Landscape Architecture and Urban Design in an Architecture Curriculum ........................................................................................................................................ 28
Analysis of the Current State of Interdisciplinary Landscape Architecture Education .............................................. 29
Aqueduct Futures: Transdisciplinary Communication about Sustainability and Adaptation ........................................ 30
Assumptions to Arguments: A Framework for Generative and Reflective Design Process ........................................... 31
Balancing Learning Objectives and Online Instruction in Course Development .......................................................... 32
Compiling in the Core; Computer Programming in the Landscape Architecture Curriculum; Apps, Scripting, Macros & Interaction ....................................................................................................................................... 33
Cross-Disciplinary Digital Pedagogies .......................................................................................................................... 34
Design in the Data Cloud: Preparing Students to Effectively Leverage Quantitative Evidence Based Design Tools ........................................................................................................................................... 35
Design Week: A New Approach to Integrating Student Learning and Faculty Research .................................................. 36
Digital Landforms [Surface Treatment] .............................................................................................................................. 37
Dinner with Olmsted: Education around the Breakfast Table ............................................................................................... 38
Discovering Values: Social Constructivism in Landscape Architecture Pedagogy ............................................................... 39
Ecological Design | Design Ecology: Integrating Ecological Thinking into Early Design Education .............................. 40
Educational Practice: Psychology of Pictorial Representation as a basis for Design Education ........................................ 41
Experiential Learning: A Strategy to Improve the Study Abroad Learning Experience for Landscape Architectural Students ........................................................................................................................................ 42
From Itasca 1.0 to Itasca 3.0: Lessons Learned in Evolving a Field Based Curriculum for Students Entering an MLA Curriculum ........................................................................................................................................ 43
Igniting Creativity in the Design Studio: Ideas for Action .................................................................................................... 44
Improving Site Engineering Instruction; Comparison across Multiple Data Sets ............................................................ 45
Improving Student Learning through Integrated Project Experiences .................................................................................. 46
Institutional Archives: Strategic Preservation ....................................................................................................................... 47
Integrating Disciplines and Teaching Relationships Between Ecology, Experience and Design Through Time and Process ........................................................................................................................................... 48
Integration of Participant Input into the Design Process: A Model for Design Education .................................................. 49
Inter-dimensional and Multi-scalar Strategies For Teaching Interdisciplinary Design ......................................................... 50
Landscape Architecture 2.0 ................................................................................................................................................... 51
Landscape Architecture from the Active Learning Cloud .................................................................................................. 52
Landscape Architecture Graduate Education in the Twenty-first Century .......................................................................... 53
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Editing Emergence: The Generative Capacity of Maintenance as a Design Instrument</td>
<td>81</td>
</tr>
<tr>
<td>Industrial Labyrinth in the Heart of Birmingham</td>
<td>82</td>
</tr>
<tr>
<td>Internal Water Storage Layer To Improve the Performance of A Texas Field Bioretention Cell in Treating Urban Highway Runoff</td>
<td>83</td>
</tr>
<tr>
<td>Landscape of Stone and the Art of Construction: The Partnership of Lawrence Halprin and Stone Mason Edward Westbrook</td>
<td>84</td>
</tr>
<tr>
<td>Mainland Quality: Meaning and Endurance in China's Contemporary Landscape</td>
<td>85</td>
</tr>
<tr>
<td>Material Reuse in the Landscape: The Feasibility of Reusing Wood in Landscape Construction and Design</td>
<td>86</td>
</tr>
<tr>
<td>Panel: Vegetative Roof Plant Establishment in the South Central Plains: Findings, Challenges and Lessons Learned</td>
<td>87</td>
</tr>
<tr>
<td>Stakeholders' Perception on the Design and Feasibility of the Fused Grid Street Network Pattern</td>
<td>88</td>
</tr>
<tr>
<td>Taking it to the Street</td>
<td>89</td>
</tr>
<tr>
<td>The Art and Craft of Detailed Design in the Sustainable Era</td>
<td>90</td>
</tr>
<tr>
<td>Urban Landscape Stormwater Mitigation: Green Walls as a Tool</td>
<td>91</td>
</tr>
<tr>
<td>Vulnerable by Design: Consequences of Infrastructure Failure in the Sacramento-San Joaquin Delta</td>
<td>92</td>
</tr>
<tr>
<td><strong>History, Theory &amp; Culture</strong></td>
<td>93</td>
</tr>
<tr>
<td>&quot;Transit Deserts&quot;: The Theory of Long Term Placed-Based Transportation Inequities</td>
<td>94</td>
</tr>
<tr>
<td>A Revised Blueprint for A Dryland Democracy</td>
<td>95</td>
</tr>
<tr>
<td>Achille Duchêne and the Revival of Treillage</td>
<td>96</td>
</tr>
<tr>
<td>American Vauxhall Gardens and the Emergence of Nightlife</td>
<td>97</td>
</tr>
<tr>
<td>An Aesthetic of Place in Film vis-à-vis Film as a Medium Globalization</td>
<td>98</td>
</tr>
<tr>
<td>An Analysis of the Spatial Structure of the National Palace of Queluz</td>
<td>99</td>
</tr>
<tr>
<td>An Overlooked Pioneer: Reconsidering the Final Works in a Career</td>
<td>100</td>
</tr>
<tr>
<td>Babylon Sisters and Labyrinthine Cities of Words</td>
<td>101</td>
</tr>
<tr>
<td>Borrowed Scenery: Public Parks in Modern Shanghai (1842-1948)</td>
<td>102</td>
</tr>
<tr>
<td>Chatham Village; A Look at Spatial Experiences Through Time</td>
<td>103</td>
</tr>
<tr>
<td>Cultura and the Counsel of Roberto Burle Marx</td>
<td>104</td>
</tr>
<tr>
<td>Deciphering Historic Landscapes: A Case Study of Slender West Lake in Yangzhou, China</td>
<td>105</td>
</tr>
<tr>
<td>Deluxe Jim Crow and the Equalization School Landscape of Georgia, 1950-70</td>
<td>106</td>
</tr>
<tr>
<td>Designing a Riverfront Park from a West Virginia Brownfield</td>
<td>107</td>
</tr>
<tr>
<td>Designing and Operating Synthetic, Self-Organizing, Sustainable Ecologies at Biosphere 2</td>
<td>108</td>
</tr>
</tbody>
</table>
Designing and Preserving Change: An Examination of the Home of Landscape Architect James Rose .......................................................... 109
Designing from the Inside-Out: Anna Halprin’s Role in Lawrence’s Search for Authenticity in Landscape Creation .......................................................... 110
Enduring Values, Shifting Themes: Patterns of Environmental Practice in Australian Landscape Architecture, 1960-2012 .......................................................... 111
Eruv: Embracing Time and Space .................................................................. 112
Falling Barns: Registers of Social and Economic Evolution in the Arkansas Ozarks .......................................................... 113
Federal Metropolis ..................................................................................... 114
Finding Common Ground: A Method for Re-Imagining National Parks ..................................................................................... 115
Force of Personality: Design Decisions Though Dialogue .......................................................... 116
Getting from One to Five: A Discussion of the Design Evolution of Post-industrial Site Reclamation Models .......................................................... 117
Ian McHarg’s Aesthetics ............................................................................ 118
Learning from Craft: Reconsidering Professional Identity .......................................................... 119
Managing Heritage of South Asian Cultural Landscapes: Retrospect and Prospects .......................................................... 120
Materializing Time ..................................................................................... 121
Meaning of the Built Environment: Differences and Similarities between Designers and Users .......................................................... 122
Migratory Infrastructure ............................................................................ 123
Mosaic Modernity: The Public Park in 20th Century China .......................................................... 124
Natural Elements and the Embodiment of Time in Place in Iranian Traditional Architecture and Landscape Architecture: from Chahār-Soffeh to Chahār-Bāgh .......................................................... 125
Novel Landscapes: Urban Transitions and River Transformations .......................................................... 126
Paradise in Conflict: Reexamining and Safeguarding the Genius of the Mughal Gardens of Kashmir .......................................................... 127
Remnants and Remembrance of WW II Japanese American Confinement Sites in the American West .......................................................... 128
Rohwer Memorial Cemetery: A Story of Hope and a Desire for Permanence .......................................................... 129
Sites of the Post-Apocalyptic Western: Landscape Architecture and the Moving Image .......................................................... 130
Space and Culture Under the Cherry Trees ............................................................................. 131
Space, Form, and Art: A Landscape Architect’s Framework for Public Art .......................................................... 132
Speed, Experience and the Aesthetics of Modernity in the Mid-Century American Landscape ............................................................................. 133
Sustainability Before the Word: Environmental Pragmatism from 1880-1940 in the US Patent Archive .......................................................... 134
The Built Vestiges of Host Cities of Multiple Mega-Events ................................................................. 135
The New Topographies: Radical Shifts in Landscape Thinking and Valuation in the 1970’s .................. 136
The Presence of Place and Time in Landscape Photography ................................................................. 137
The Relationship Between a Plant’s Traits, a Plant’s Taste and Function, and Feng Shui .................. 138
The Tulip Era Gardens at Ottaman ....................................................................................................... 139
Theory as Groundless—The Specter of Skepticism .......................................................................... 140
Toomer’s Oaks: What a Pair of Poisoned Trees Might Tell Us About Ourselves .............................. 141
Toward a New Landscape: The Evolution of Modular Form in Ian McHarg’s Theory of Design ....... 142
Translating “America’s Best Idea”: Charles A. Richey & Post-War Planning of the Japanese National Park System .................................................................................................................. 143
Turkish Understanding of Gardens from a Historical Perspective .................................................... 144
Twelve Prescriptions for an Authentic Vernacular of our “Global Village” .................................... 145
Urban Farming and the Reappearance of a Landscape Architectural Tradition ............................. 146
Urban Fruits of the Northeast ............................................................................................................. 147
Variations on a Theme by Clarence Stein ......................................................................................... 148
Viking Cities: The Other Medieval Planning Tradition ..................................................................... 149
Virginia’s Crooked Road and the Landscape of Bluegrass ............................................................... 150
White Gloves/Work Gloves: On-Site with Beatrice Farrand ............................................................ 151

**Landscape Planning & Ecology** ........................................................................................................ 153

A Geodesign Approach for Energy Development-enabled Sustainability ........................................ 154
ALL-IN: Speculative Landscape Infrastructures for Leveraging, Celebrating, and Contesting Dynamic Systems in Biloxi, Mississippi .................................................................................... 155
An Analysis of Permaculture Designed Communities in the Southeastern United States ............. 156
Applying Ecological Footprint and Ecosystem Services Methods to Calculate Ecological Capacity and Demand at a Countywide Scale ................................................................................. 157
Channel Change in Northeast Kansas Streams .................................................................................. 158
Commemorating Africantown: A New State Park in Alabama .......................................................... 159
GIS-Based Coupled Cellular Automaton Model to Determine Irrigated Agriculture Land Use in the High Plains Aquifer Region .......................................................................................................... 162
Implementing Corridors for Climate-Induced Wildlife Migration: On-the-Ground Successes and Challenges in New York and Vermont ................................................................. 163
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intentional Adaptation: Shaping the Land to Create a Dialogue Between a City and an Eroding</td>
<td>164</td>
</tr>
<tr>
<td>Coastline</td>
<td></td>
</tr>
<tr>
<td>Naturalness in Stream Restoration Projects: Learning from Johnson Creek</td>
<td>165</td>
</tr>
<tr>
<td>Networking School Green Roofs to Achieve Storm Water Benefits: Brier’s Mill Run Watershed Case Study</td>
<td>166</td>
</tr>
<tr>
<td>New Beach Designs as an Urban Adaptation to Sea Level Rise</td>
<td>167</td>
</tr>
<tr>
<td>Programming the Middle Landscape: Cherry Grove Farm Case Study</td>
<td>170</td>
</tr>
<tr>
<td>Reimagining a Sustainable Future for Mine-Scarred Lands</td>
<td>171</td>
</tr>
<tr>
<td>Re-presenting Nature: Developing a Stream Swamp Forest Interpretive Exhibit</td>
<td>172</td>
</tr>
<tr>
<td>Sea Level Rise Adaptation Strategies: A Case Study of Mokpo, Korea</td>
<td>174</td>
</tr>
<tr>
<td>Study of Landscape Fragmentation as an Impact of Natural Gas Drilling in North Texas</td>
<td>175</td>
</tr>
<tr>
<td>Tangshan Nanhu Eco-city Central Park - From Brownfield to Green Park</td>
<td>176</td>
</tr>
<tr>
<td>Urban Trail System Planning in Western United States: An Analysis of Process and Implementation Efforts</td>
<td>177</td>
</tr>
<tr>
<td>People-Environment Relationships</td>
<td>179</td>
</tr>
<tr>
<td>A Comparative Study of Perceptions and Barriers to Walking in Residential Neighborhoods</td>
<td>180</td>
</tr>
<tr>
<td>A Home Away From Home: Biophilic Design for Confined, Long-term Dwellings Synonymous with Spaceflight and Spaceflight Analogous Environments</td>
<td>181</td>
</tr>
<tr>
<td>A Visual Inquiry into Metropolitan Areas and How They are Perceived by Urban Planners</td>
<td>182</td>
</tr>
<tr>
<td>Ahupua’a as A Model for Sustainable Productive Urban Landscapes</td>
<td>183</td>
</tr>
<tr>
<td>Bugs, Prairie Dogs, and Tranquility: Why Stapleton Residents Love Stormwater Parks</td>
<td>184</td>
</tr>
<tr>
<td>Bukit Brown Cemetery Landscape Scenario</td>
<td>185</td>
</tr>
<tr>
<td>City Parks and Cities: A Demographics Impact Model for Park-Related Expenditure</td>
<td>187</td>
</tr>
<tr>
<td>Combating Obesity with Mud Pies and Tree Cookies: A Case Study of Three Natural Play Spaces in Northwest Minnesota</td>
<td>188</td>
</tr>
<tr>
<td>Cow Country: Parsing the Global in the Local Beef Landscape</td>
<td>189</td>
</tr>
<tr>
<td>Title</td>
<td>Page</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Cultural Landscapes Under Climate Change</td>
<td>190</td>
</tr>
<tr>
<td>Defining Successful Elements of Community Gardens in Small U.S. Towns</td>
<td>191</td>
</tr>
<tr>
<td>Design Elements and Applications to Solving Obesity: The Behavioral Responses in the University of Georgia Lunchscapes</td>
<td>192</td>
</tr>
<tr>
<td>Developing a Shorter Version of the Irvine-Minnesota Inventory for Youth</td>
<td>193</td>
</tr>
<tr>
<td>Do People Understand Infiltration Along Urban Streets? – A Comparative Survey of Infiltration Systems and Their Aesthetic Values</td>
<td>194</td>
</tr>
<tr>
<td>Doing Time in this Place</td>
<td>Mother-Child Gardening Programs in Prison</td>
</tr>
<tr>
<td>Dumping on Dixie &quot;Is Public Participation Needed in the Landfill Creation Process&quot;</td>
<td>196</td>
</tr>
<tr>
<td>Effects of Landscape on Psychological Response and Brain Region Activity</td>
<td>197</td>
</tr>
<tr>
<td>Engineered Ecologies of the Pearl River Delta</td>
<td>198</td>
</tr>
<tr>
<td>Enhance Health of Pre-school Children Through Prolonged Engagement on Playgrounds</td>
<td>199</td>
</tr>
<tr>
<td>Environmental Correlates of Health-related Quality of Life in Hispanic Children</td>
<td>200</td>
</tr>
<tr>
<td>Establishing A Dose-Response Curve for The Impact of Community Forests on Recovery from Acute Stress</td>
<td>201</td>
</tr>
<tr>
<td>Healing the Invisible Wounds of War: Therapeutic Landscapes for Wounded Warriors Suffering from Post Traumatic Stress Disorder (PTSD)</td>
<td>202</td>
</tr>
<tr>
<td>Hospitals and Immigrants: Revitalizing/Replacing the Gateway Neighborhood</td>
<td>203</td>
</tr>
<tr>
<td>Human Health and Well-Being Benefits of Urban Greening: The Scientific Basis for Emerging Landscape Design Norms</td>
<td>204</td>
</tr>
<tr>
<td>If You See Something, Say Something: Community Response (and Non-response) to Outdoor Advertising Regulation in Los Angeles</td>
<td>205</td>
</tr>
<tr>
<td>Influences of Plants' Motion on Landscape Preference, Attention Recovery and Affective Response</td>
<td>206</td>
</tr>
<tr>
<td>Interpretive Signs in the Landscape: Are People Learning from Them?</td>
<td>207</td>
</tr>
<tr>
<td>Into the Woods: An Anecdotal Study Exposing Children to Outdoor Classrooms</td>
<td>208</td>
</tr>
<tr>
<td>Investigating Children’s Play Space in the Context of Rapidly Developing City</td>
<td>209</td>
</tr>
<tr>
<td>Just in Time: Psychophysiological Coherence in the Landscape</td>
<td>210</td>
</tr>
<tr>
<td>Land, Water, and Territory: A 3,000-year Study of Niche Construction and Culture Change at Tikal, Guatemala</td>
<td>211</td>
</tr>
<tr>
<td>Life in the Ruins: Endings, Limits + Continuations</td>
<td>212</td>
</tr>
<tr>
<td>Linking of Social values for Riparian Ecosystem Services and Quality of life</td>
<td>213</td>
</tr>
<tr>
<td>Lost Love: Thoughts on Canals, Chemicals, Caps, and Lingering Resistance to Climate Science</td>
<td>214</td>
</tr>
<tr>
<td>Neighborhood versus Route Environments for Active Commuting to School</td>
<td>215</td>
</tr>
<tr>
<td>Title</td>
<td>Page</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>New Tools for Measuring and Predicting Place Attachment on a Neighborhood Level</td>
<td>216</td>
</tr>
<tr>
<td>Parsing Wildness: Parks in the Shrinking City</td>
<td>217</td>
</tr>
<tr>
<td>Planting Design and Its Impact on Efficacy in Therapeutic Garden Design for Dementia Patients in Long-term Care Facilities in North Texas</td>
<td>218</td>
</tr>
<tr>
<td>Reading Place Through Reconnaissance Running</td>
<td>219</td>
</tr>
<tr>
<td>School-based Environmental Approaches to Promote Walking to School: Modifiable Micro-scale Environmental Factors</td>
<td>220</td>
</tr>
<tr>
<td>Spatiotemporal Soundscape Variation of Large Urban Parks: An Analysis of Psychoacoustic and Physical Indicators of St. James’s Park, London</td>
<td>221</td>
</tr>
<tr>
<td>Temporal Agents and the Power of Play in the Built Environment</td>
<td>222</td>
</tr>
<tr>
<td>The Case Studies of Treatment Effect of Horticultural Therapy Activities on Dementia Patients</td>
<td>223</td>
</tr>
<tr>
<td>The Cognitive Play Behavior Affordances of Natural and Manufactured Elements within Outdoor Preschool Settings</td>
<td>224</td>
</tr>
<tr>
<td>The Decommissioning of Parks in Detroit, Michigan: A New Strategy</td>
<td>225</td>
</tr>
<tr>
<td>The Effect of Sound of Water on Human Physiological Responses</td>
<td>226</td>
</tr>
<tr>
<td>The Ignored/Lost Contest for Land-waste Infrastructure in India</td>
<td>227</td>
</tr>
<tr>
<td>The Physical Activity Affordance of Diverse Park Settings in Accordance to Gender</td>
<td>228</td>
</tr>
<tr>
<td>The Relationship between Poverty, Community Land Use, and Older Adults’ Opportunities for Social Integration</td>
<td>229</td>
</tr>
<tr>
<td>The Socio-cultural Meaning of Urban Comfort and Its Consequences for Urban Landscape Design</td>
<td>230</td>
</tr>
<tr>
<td>The Suburban Threshold and the Potential Link to Community Sociability</td>
<td>231</td>
</tr>
<tr>
<td>Time to Garden: Reemergence of the Vegetable Garden</td>
<td>232</td>
</tr>
<tr>
<td>Using Willingness-to-Pay to Measure Perceived Economic Values of Activity-Friendly Environments</td>
<td>233</td>
</tr>
<tr>
<td>Visual Similarity and Biological Diveristy of Street Trees - Seeing is Believing</td>
<td>234</td>
</tr>
</tbody>
</table>

**Research & Methods** .............................................................................................................. 235

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Comparative Analysis of Planning Decisions about Vacant and Abandoned Lots in U.S. Cities</td>
<td>236</td>
</tr>
<tr>
<td>A Mixed Methods Approach to Studying Creativity in Design Students</td>
<td>237</td>
</tr>
<tr>
<td>A Synthetically Process to Evaluate the Agritourism Landscape in Taiwan</td>
<td>238</td>
</tr>
<tr>
<td>Applying Science to Design for and Evaluate Performance</td>
<td>239</td>
</tr>
<tr>
<td>Asking the Difficult Questions: The Importance and Potential of Landscape Architectural Design Research in Exploring Answers to Complex Problems</td>
<td>240</td>
</tr>
<tr>
<td>Challenges and Lessons Learned from Developing a Critical Research Practice in an Established Landscape Architecture Firm</td>
<td>241</td>
</tr>
</tbody>
</table>
Connecting Research to Practice: Publishing Trends Over Time ................................................................. 242
Defining and Valuing Research in Landscape Architecture ........................................................................... 243
Do Social, Economic and Environmental Benefits Always Complement Each Other? A Study of Landscape Performance ................................................................................................................................. 244
Economic Valuation of the Activity-Friendly Environments: The Interaction Among Residential Single-family Property Values, Activity-Friendly Amenities, and Children’s Physical Activity ................................................................. 245
Evaluating Landscape Performance: Economic Benefits ........................................................................... 246
Evaluating Landscape Performance: Environmental Benefits ................................................................. 247
Evaluating Landscape Performance: Social Benefits .................................................................................. 248
Fabricating Landscape Surfaces: Redefining Digital Design and Fabrication Techniques for Landscape Architectural Applications .................................................................................................................. 249
Food-shed: Re-envisioning the Food Network both Inside and Outside of Hong Kong .............................. 250
Geomorphic and Human Induced Factors of Subwatershed Types in Kentucky ......................................... 251
Green Roof Performance Study: Puget Sound Region ................................................................................. 252
Investigating Social Disparities in Urban Canopy Availability and Park Accessibility .............................. 253
Making a Case: Strategies for Developing Landscape Performance Case Studies ....................................... 254
Measuring Gully Erosion in Two Disturbed Midwestern Landscapes .......................................................... 255
On the Research Front: 2012 Landscape Architecture Foundation Case Study Investigation and the Case of Streetscape .................................................................................................................................................. 256
Panel: State of CELA Research Initiatives ..................................................................................................... 257
Perception of a Functional Wetland Landscape in a Senior Living Community ........................................... 258
Photography as a Medium of Inquiry ........................................................................................................... 259
Quantifiable Landscape Performance Benefits: The case of Brent Elementary School ............................ 260
Reconstruction of the “Vegetation-Bearing Architectonic Structure and System (1938)” ...................... 261
Reforestation the Reclaimed Appalachian Coal Mined Landscape Over Space and Time ........................... 262
School Siting Policies: Identifying a Healthy and Safe Learning Environment ............................................ 263
Stormwater Runoff from a Small Integrated Green Roof System at Kansas State University: A Review of Data Gathered over Parts of Four Years ................................................................................. 264
Sustainable Public Open Space: Enduring Brownfields Makeovers in Urban Landscapes ...................... 265
The Case for a Scholarship of Business Practice in Landscape Architecture ....................................... 266
The Livable Campus: Standards of Measurement ......................................................................................... 267
The Stormwater Treatment Chain: Quantifying the Effects in the Southeastern United States ............ 268
Urban Prospects Along the Aeolian Coast: Infrastructure and the Three Regional Landscapes of North American Wind Power ................................................................. 269

Water Use Scenarios: An Assessment of Land Use and Crop Alternatives in a Rural Nevada Watershed ........................................................................................................ 270

What We Design and What We Experience: Comparing the Objective and Perceived Measures of Percentage of Tree Canopy ......................................................................... 271

Service Learning & Community Engagement .................................................................................................................. 273


Assessing the impact of an immersive service-learning program in Tanzania: Lessons from the field 275


Capturing Collective Imagination: Towards the Well-being of Mesopotamia’s Oldest Living Settlement ..................................................................................................................... 277

Covenant Farms ............................................................................................................................................................. 278

Diagramming the Community Design Process: Making Visible the Complexity of Community Participation in Design .......................................................................................................................... 279

Escuela Ecologica Saludable Initiative: Facing the Challenges of Classroom Construction in the Assentimientos Humanos of Lima Peru ....................................................................................... 280

Four-legged Ecoreveletory Agents of Engagement: The Potential of Targeted Grazing as a Tool for Community Building, Ecological Restoration, and Public Outreach ..................................................................................... 281

Ideologies and Challenges in Shifting Park Discourses of Million Amenity Park, Busan, South Korea. 282

Inching Towards Change: The Long Game of Community-University Partnerships ................................................................................................................................. 283

Lessons from Five Service-Learning Projects ...................................................................................................................... 284

Opportunities and Constraints: Challenges and Benefits of Service Learning ................................................................................................. 285

Promoting Civic Engagement Through Community Engaged Design: The Case Of The Mountain View Community Garden .................................................................................................................... 286

Resourcefulness and Community Design: African American Yards in Baton Rouge, Louisiana ................................ 287

Solar Park on a Landfill - Integrating Service Learning and Community Impact in the Design Process 288

Stretching Sustainability: Interdisciplinary Design/Build at the Limits ...................................................................................... 289

Taming Wicked Problems in Community Design through use of Web-Conferencing ................................................................................................................................. 290

The Symbiotic Nature of Giving and Receiving: Service-learning and Social Diversity ...................................................................................................................... 291

Using Service Learning Design Studios to Create Community Connections and Increase Their Value to Stakeholders, Clients and Professional Designers ........................................................................................................ 292
Sustainability ........................................................................................................................................... 293
Case Study: Sustainable Greenway to EcoDistrict .................................................................................. 294
Cross Creek Ranch Master Planned Community: Landscape Performance and Lessons Learned .......... 295
Drawing Sustainable Farming Practices ..................................................................................................... 296
Eating Time and Place: A Systems Framework ......................................................................................... 297
Economic Analysis of Residential Rainwater Harvesting Systems in the City of Austin, Texas ............ 298
Energy landscapes: Past and present .......................................................................................................... 299
Multifunctional Landscapes, Sustainability and Measures of Performance in the Urban Context .......... 300
Natural Plant Communities as Green Roof Templates: An Interdepartmental Pilot Study ...................... 301
Promoting Sustainability by Designing for the Full Lifecycle Cost of a Project ....................................... 302
Reactivation of Public Space with Clean Energy for An Ecotourism Development in Alacati, Turkey . 303
Relationships among Flow Experience, Qi Experience, Attention Restoration and Preference .......... 304
Reviews of Theoretical Foundations of LEED-ND: Scale Issues in Sustainable Neighborhood Development ........................................................................................................................................... 305
Shan-Shui City – Exploring Sustainable City Development in China ...................................................... 306
Successes and Failures of the First Slow City in Turkey: The Case of Seferihisar .................................... 307
Sustainable Development Along the Egyptian Red Sea Coast: Still Possible? ........................................ 308
Sustainable Outcomes of a Flexible Grid: La Prusia, Nicaragua ................................................................. 309
The Potential of Urban Agriculture to Mitigate Urban Heat Island Effects ............................................. 310
The Price of Comfort: A Cost-Benefit Analysis and Case Study of How Landscape and Architectural Design Can Reduce Human Dependence on Climate Control ........................................................................................................ 311
The Productive Value of Non-Productive Space ....................................................................................... 312
Three Designs for the Lake Winnipeg Watershed: Fostering Ecological Literacy ................................. 313
Urban Flow-Through Facilities’ Soil Media Compositions for Stormwater Quality and Quantity Improvements ........................................................................................................................................... 314

Urban Design ............................................................................................................................................ 315
Abandoned Spaces to Community Places: How Vacant Lots can be Transformed in to Healthy Civic Spaces ........................................................................................................................................... 316
Building a Sustainable Urban Landscape: Adaptive Re-Use of Transportation Infrastructures ........... 317
Children's Use of Pathways; Independent Mobility and Playing along the Way ..................................... 318
Complete and Safe Streets: From Policy to Practice ................................................................................ 319
Conjoined Nature in Buildings .................................................................................................................. 320
Cross-purposing the Easement: A Case Study in River Easement Use in Tokyo, Japan

Degrees of Life and Complexity in Istanbul Informal Settlements

Designing Dredge: The Role Dredging in the Urban Landscapes of Great Lakes

Dispersed

Does More Centrally Located Schools Promote Walking to School?: An Exploratory Study using the Closeness Centrality Index

Equity and Urban Design, Why Time and Place Matter

Greenways Going Further: Can Greenways Systems Theory Bring Synergy to the Rest of the City? ..

Identifying Perceptions of the Creative Class Regarding Lost Space in Downtown Dallas

Landscape Urbanism Meets Ecotopia: Remaking Seattle’s Central Waterfront?

Linking the Park to the Bay: Realizing John Nolen’s 1908 Plan for San Diego

Master Planning for the Arts: Identifying the Skills and Roles for Landscape Architects

Modular Habitat

Nature in the Indian Mega-City: Locating Identity and Place

Northern Mexican Land Reserves: Urban Habitat Reconciliation on the Periphery

Reasserting the Temporal: Shrinking Cities and Urban Vacant Lands

Share the Road – A Tool Kit for University Campus Complete Streets: The case of The University of Maryland

Shoehorning Native Plants into Urban and Exurban Environments

Space in Time: Temporary Intervention as Urban Design

Space, Time, Place, Duration: The Evaluation of Designed Urban Landscape Through Public Social Media Activity

Sustainable Master Planning with Metrics: Review of a Mixed-use Student Housing Development at Texas A&M University

Swale Demonstration Project: A Case for the Use of Alternate Plants

The “Pedestrian Realm” as a Genesis of Commerce: Bazaars of the East and Mixed-use Centers of the West

The Infrastructure of Food

The RUBAN and the Phalansteres

The Urban Revolution: Roles for Landscape Architecture in the Twenty-first Century Global Urban Transformation

Topographically Calibrated Density: Towards a Suburban Template for Steep Sites

Transient Landscapes and Urban Design
Foreword - Space • Time / Place • Duration

David R. Coffin would introduce his class on the history of gardens by stating that the topic to be investigated was, "man's [sic] relationship to the passage of time as expressed in what is, perhaps, our most ephemeral form of art." He would then continue with a generalization that warrants much more than a semester's length of study: the Italians of the sixteenth century ignored the passage of time, easily combining old and new with a life comes and life goes attitude (think of the inclusion of antiquities in the constructions at Villa d'Este or Villa Giulia); the French of the seventeenth century tried to arrest the passage of time and make the one perfect moment last for eternity (think of the well trimmed plantings and groomed paths at Vaux-le-Vicomte or Versailles); and, the English of the eighteenth century reveled in the passage of time to the point of planting dead trees and building fake ruins (think of the follies at Stowe or the Leasowes).

With an eye on the vernacular United States, J.B. Jackson wrote in his still widely read essay "The Word Itself" that landscape is, "a portion of the earth's surface that can be comprehended at a glance," but that the making of landscape should be understood as deliberately speeding up or slowing down natural processes. To extend Coffin's generalizations beyond the art of the garden and across the generations, one could say that the Americans of the nineteenth century punctuated the passage of time by stretching society's reach—and grasp—in a present moment (think of the lengthening of the day by gas and then electric illumination, the compression of travel time by railroads, and the instantaneous communication over great distances made possible by the telegraph, telephone, and radio). Then the twentieth century, Americans along with those in many other nations pocketed the passage of time with separated and insulated areas of control (think of local regulations to manage storm water on-site and of national plans to re-distribute populations and industries over wide areas in order to survive nuclear detonations).

It is difficult to generalize an attitude to the passage of time in the first quarter of the twenty-first century, but the increasing use of terms such as novel ecologies, hybrid landscapes, and green infrastructure suggests a new kind of engagement with the temporal cycles of biophysical systems. The proposed design for Waller Creek in downtown Austin offers an example of the challenges and opportunities presented with approaches. The project centers on a one and one-half mile stretch of a narrow, degraded, flood prone waterway. A flood control tunnel, now under construction, will enable a managed stream flow regime that will support a riparian corridor. The resulting landscape can be characterized as equally an act of restoration and a product of invention.

As Coffin and Jackson along with many, many others have made clear, the relationships between space and time, between place and duration are foundational to the education, practice, and profession of landscape architecture. At the 2013 meeting of the Council of Educators in Landscape Architecture, we invite participants enter into a sustained discussion about how these relationships have been, are, and may in the future be a basis for shaping the environment.

Allan W. Shearer
The University of Texas at Austin
Chair, CELA 2013 Host Committee
Communication & Visualization
10-Minute Map: Uncovering An Alternative Narrative for Nebraska's Oregon Trail Landscape

Bret Betnar, University of Nebraska-Lincoln, United States, bbetnar2@unl.edu

Keywords: mapping, motion graphics, animation, landscape narrative

Purpose + Background
The purpose of this paper/presentation is to illustrate how motion graphics can reveal new narratives in the Nebraska Oregon Trail landscape.

Traditionally, a map is thought to be static; a representation of a place at a particular time viewed through a specific lens – usually the mapmaker’s. Places change through the seasons and over the years, thereby limiting the fixed map’s efficacy for a changing, dynamic world. Although the static map has its utility, employing current technology we can make maps move, morph, grow, shift, zoom, and even combine them with other maps.

As James Corner points out in the Agency of Mapping, mapping “reveals and realizes hidden potentials”. Thus, the 10-minute Map explores the potential of motion graphics, video and animation to extract and reorganize these hidden potentials. It seeks to reveal the unknown, forgotten or over-looked and thereby conceives an image of the Nebraska landscape that extends beyond its uniformly understood image as corn producer.

Methods, Findings + Importance
The 10-minute Map begins with a historical narrative and spatial study of the yeoman farming tradition and the effects of the Homestead Act upon the land. National Park Service and other governmental mapping and data are layered onto the landscape narrative. As the map proceeds, distinct landscape zones and important nodes are identified and organized along Nebraska’s Oregon Trail landscape. The subject matter is presented, developed and compared to one another using a combination of 2D/3D motion graphics and video.

The 10-minute Map is broken up into five chapters of roughly two minutes each. Each segment highlights a node within the Oregon Trail landscape. Collectively, they serve to illuminate connections between today and a landscape long forgotten. In one example, correlations are revealed between the philosophy of yeoman farmers, through homesteading, to Nebraska’s present-day microbrewery industry and its agricultural underpinnings.

Utilizing motion graphics, animation and video permits navigation over the vast landscape of both time and space. It reveals an alternative lens of the Nebraska landscape; a way for both residents and non-residents to rekindle interest in experiencing this landscape anew. This type of visualization will contribute to the expanding and evolving representational theory in landscape architecture.
3D Digital Graphics in Landscape Architecture Professional Practice: Current Conditions in a Nutshell

Shujuan Li, Utah State University, United States, shujuan.li@usu.edu
Jie Yan, Utah State University, United States, jessyanjie@gmail.com
Bo Yang, Utah State University, United States, bo.yang@usu.edu

Keywords: 3D Digital Graphics, Landscape Architecture, Professional Practice

3D design and representation have a long history and have been a critical part in the landscape architecture profession. Recent development in 3D digital graphics programs further promotes the development of 3D representation in landscape design. However, little study has been conducted to document the current conditions of 3D digital graphics application and some important questions are largely unknown. For example, who are the primary users of 3D digital graphics programs; and what are the most popular 3D rendering packages and why. Understanding these questions are not only important to educators but also to landscape architects and software developers. This study evaluates the current applications of 3D digital graphics in landscape architecture professional practice, based on a national survey of landscape architecture firms in the U.S. Over 400 firms responded. Over 30% of them use 3D digital graphics “very often” or “often.” In addition, over 85% of experts and 60% of experienced landscape architects use 3D digital graphics “very often” or “often.” The results also show that user’s knowledge of 3D digital graphics is a main factor that determines the usage of 3D digital graphics. The most broadly used 3D packages are SketchUp (93%), AutoCAD Civil 3D (43%), and ArcGIS (38%). Although ArcGIS has a relatively long history in the realm of 3D representation, it hasn’t become a software program that share a large portion of the user group. Most firms started to use it after 2000. In contrast, SketchUp as a relatively new program, has been enjoying an exponential growth of users since 2005. The main barriers to for a wider use of 3D digital graphics programs are steep learning curve and high costs of graphics programs.
Communication and Visualization of the Space-Time Dimensions of Landscape Themes

Olaf Schrotth, University of Sheffield, United Kingdom, olaf_schroth@gmx.de
Stephen Sheppard, University of British Columbia, Canada, Stephen.Sheppard@ubc.ca
Ellen Pond, Pembina, Canada, ellenpond@gmail.com

Keywords: landscape visualization, scenarios, virtual globes

Space and time are closely linked because landscapes are inherently dynamic. The duration of change can reach from minutes and hours to decades and even millennia. In addition, change can be cyclical, e.g. ephemeral, or it can be linear. The longer the time scale, the more uncertainties are embedded.

In the background part, I will discuss the scenario method as an approach to explore landscape futures and visualization methods for the communication of space and time in landscape architecture and planning. The scenario method provides a qualitative approach to discussing spatio-temporal themes in landscape architecture and planning (Pettit et al. 2011; Baker et al. 2004; Tress and Tress 2003).

Landscape planning might also learn from cartography, where spatio-temporal techniques have been developed to represent and explore new space-time relationships in multidimensional data (MacEachren 2004).

Main part of my presentation is the Kimberley Climate Adaptation Plan (KCAP) case study for which I will discuss spatio-temporal issues around climate related landscape planning (Pond et al. 2010; Pond et al. 2009). Kimberley is a rural former mining town in British Columbia. The city launched a participatory process addressing future issues around urban development, forest and water management and adaptation to climate change impacts. The project included three stakeholder workshops and one public open house. The researchers produced various types of interactive and dynamic landscape visualizations, based on geodata from the stakeholders, and analyzed in ArcGIS, and visualized in CommunityViz/GoogleEarth. During the process, participant feedback was collected in quantitative pre-/post questionnaires and qualitative in-depth questionnaires.

The findings from questionnaires and interviews show that different temporal phenomena and different time scales need to be distinguished. In the KCAP case study, landscape visualizations helped communicating species change in a forest landscape over a long time scale (2100+). Frequency (historic forest fires) was one temporal phenomenon in the case study, another one was progression (short-term fire spread model, long-term urban development). While frequency was visualized successfully in a static map, progression was shown as animation. Both visualizations were understood correctly as the transcriptions show, although the time travel animations were perceived as more dramatic. Photorealism helped lay viewers but additional context information was essential in communicating uncertainties in the future scenarios.

More research is suggested on spatio-temporal phenomena such as progression and frequency of events. Another research question is to ask whether collapsing a long-term time scale evokes as much response as collapsing a short-term time scale.
Confronting the Digital Divide

Bambi Yost, Iowa State University, United States, byost@iastate.edu
Carl Rogers, Iowa State University, United States, rogersc@iastate.edu
Jon Hunt, Kansas State University, United States, jdhunt@ksu.edu
Caroline Westort, Iowa State University, United States, cwestort@iastate.edu
Cameron Campbell, Iowa State University, United States, cameronc@iastate.edu

Keywords: freehand, drafting, digital, hybrid, composite, mixed-media, practitioner, academic, practice, theory, entrepreneurial, advancing landscape graphics/representation/design, curriculum

In this panel session presenters will discuss student perceptions and limitations of creating digital and hand-rendered graphics over time. As firms continue to seek graduates with increasingly technical computer skills, landscape architecture programs are faced with the challenge of meeting these increasing digital demands. Time constraints in curriculum can limit faculty and student success. Rich explorations of vision and truth, spatial awareness, place attachment, psychogeography, cartographic interpretations, evaluation of aesthetic principles, and site-specific interventions are often overlooked as students' desire to explore digital tools exceeds their desires to explore space and place in time. How might faculty encourage alternative drawing and representation techniques to capture intrinsic and salient qualities of physical landscapes as well as push the limits of existing technologies and tools?

This panel will introduce alternative image making methods (hybrid, composite, 2-D and 3-D computer modeling, computer programming, encaustic, print making, image transfers, paint gels, and more) used to strengthen and challenge traditional means (hand drawing and technical rendering) for visual communication. In addition, graphic and representation trends within the practice of landscape architecture and design and the pedagogy of teaching visual communication will be challenged as we argue for a new way of envisioning the profession and the practice of design.

We welcome debate and seek to stir imagination as we investigate possibilities of what could be. Please join us for this session.
Connecting the Dots: Mapping as an Analytical, Synthetic and Formative Tool in Design Research

Sara Queen, North Carolina State University, United States, sara_queen@ncsu.edu
Tania Allen, North Carolina State University, United States, tlallen2@ncsu.edu

Keywords: Mapping, Community Design, Cross-Discipline Research

If we identify ourselves as designers working in the public sphere and for the public interest, we must operate simultaneously as insiders and outsiders, as speculators and social scientists. Additionally, our research methods must expand to include a diversity of perspectives and a multiplicity of lenses to understand the intricate systems comprising place. This paper outlines methods outside our current design toolbox to expand research approaches through mapping as an analytical, synthetic and formative tool. Specifically, it investigates the ability of mapping to translate research and data into critical propositional tools.

Through a cross-disciplinary graduate level seminar at the College of Design at North Carolina State University, we explored and applied diverse community engagement and research methodologies borrowed from landscape architecture, architecture, graphic design, and the social sciences. Mapping techniques were used to introduce students to research methods as cumulative, analytical and formative investigations. Students began researching local neighborhoods through the traditional methods of historical archives and GIS based data to uncover patterns in the built and social environment. From these insights, students were prompted to investigate and derive measurements of cultural, economic, political, and ecological forces precipitating these patterns. After extensive data-based research, students were then challenged to engage the community’s perception and understanding of those systems through the design and implementation of a culture probe. Pedagogically, each method of information gathering was linked to different cartographic techniques which in turn generated a variety of geo-spatial, cognitive, and phenomenological visualizations of place. Through this course structure, we found an increased investment on the part of the students to uncover and understand the complexities of place. By challenging the definitions of place to include the “thick” descriptors of dynamic social, environmental, economic, and political forces acting on a physical landscape, the course offered a foundation from which to forge new processes for discovering design intervention opportunities—a necessary paradigm shift for students, educators and practitioners alike.
Digital Media in Landscape Architecture and Planning: Synchronizing Professional Demand and Direction with Technology Curriculum

Galen Newman, Texas A&M University, United States, gnewman@arch.tamu.edu
Jun-Hyun Kim, Texas A&M University, United States, jhkim@arch.tamu.edu

Keywords: Technology, Curriculum, Digital Media, Professional Practice

Contemporary research confirms that the profession of landscape architecture is growing at a rate well below that needed to meet expected demand of our society (American Society of Landscape Architects Council on Education 2008). Simultaneously, the professions of landscape architecture and planning have shifted towards more digitally integrated practices, where multiple computer programs must be effectively utilized to complete projects. In order to effectively adjust technology curriculums to better prepare graduating students for the competitive work environment they will be facing, higher education in the landscape architecture and planning fields must obtain a firm grasp on what programs the market demands for entry level employees to know as well as confirm in what direction the market is headed.

This research presents preliminary data about digital software use in professional practices in the landscape architecture and planning fields. Two focus groups consisting of professional advisory boards critiqued a survey which was revised and then distributed via email to landscape architecture and planning offices throughout Texas. Initial findings of 50 firms assessing descriptive statistics and content analysis from open-ended questions suggest that the majority of firms (89%) work in PC oriented environments to produce final packages, and most (94%) utilize a multitude of software to complete each project. Currently, the data implies that the market requires employees to have advanced skill levels using AutoCAD, Adobe Creative Suite, ArcGIS, Google Sketch-up and Google Earth and these programs are majority utilized interchangeably. Corollary, results show that 3D software and the use of hand held devices are becoming a more effective and powerful way to deliver projects to clients. In addition, respondents suggest applying more integrated/interchangeable approaches in using digital communication tools to meet design and planning processes to enhance the transition from concept development to final outputs. Based on findings, we suggest that the digital communication curriculum in the higher education of landscape architecture and planning should consider integrating software techniques into studio classes and develop student abilities to develop a workflow between demanded programs, instead of stressing each program’s basic functions independently. In addition, digital technology curriculums in landscape architecture and planning education should adjust to promote interdisciplinarity in order to sequentially integrate digital media into core courses with intermediate and/or advanced skill levels for demanded programs. Finally, new flexible elective courses need to be immediately developed to initialize the process for keeping up with future market directions.
Digital Poucháde: Design Thinking and the Influence of Media on Landscape Architecture

Rebecca Heavner, University of Colorado Denver, United States, becky@beckyheavner.com

Keywords: Design Thinking, Media, Media Technology, Collage, Animation, Mapping, Experience, Place, Visual Monocultures

This presentation illustrates the value of collage as a design-thinking framework to develop more situated theories, methodologies and design processes for the landscape architect. Media influences the scales of practice: the designer, design process, design space and ultimately the landscape. Design is a mediated experience and the difficulty for landscape architects lies in how media ultimately influences landscape. For example, landscape architects use the Internet to find photos to imagine and represent how landscape can be transformed. The design practice of using the Internet to collect photos from one place to represent another place leaves little to the imagination why places look the same. Media has taken a strong arm over the designer and urban areas in Colorado look like places found elsewhere. Designers are subservient to the dominance of media and unwittingly create artifacts of missed opportunities in landscape. Visual monocultures point to a larger creative problem in design, a disregard of identity to context. If media becomes inscribed1 in landscape, it is crucial for designers to position themselves more prominently with media in their design process, and use methods to challenge the parameters of media, a force in landscape. Three methods of collage are presented as findings on an “experimental stage for dealing with those conditions.”2 Collage is a method that is capable of situating the landscape architect within the context of a set of problems in the design studio and the field.

- Digital Poucháde, a digital animation tool kit utilizes mixed media collage in a kinetic process to collect data, design and render experience as it relates to context in the field.

- Collage is used to formulate a methodology based on the structures of poetry. This methodology uses poetry in the form of collage to inventory and analyze relationships in the field and then communicate ideas regarding identity and the experience of place.

- Collage is used to develop a situated theory, “Intimate Infrastructure” by juxtaposing theories from art, landscape, and industrial design.
Enhancing Design Portfolios: Transitioning to Professional Practice

Nicholas Nelson, Oklahoma State University, United States, nicholas.nelson@okstate.edu

Keywords: Portfolio, Graphic Quality,

In an increasingly competitive economy and job market, undergraduate students are finding themselves competing with those holding advanced degrees and even experienced professionals for the same positions. The purpose of this study is to investigate how undergraduates can enhance their design portfolios to better compete in the job market.

A prospective employee with professional experience has a decided advantage over someone with little or no experience when competing for the same position. Likewise, someone with graduate and post graduate degrees, in a similar situation, also has additional advantages. The undergraduate’s chance to create an opportunity for themselves begins with their portfolio.

The methods of this investigation included emailing out 50 questionnaires to established firms ranging in size around the country. This was used to establish a quantitative frame of reference based on the responses received. The responses received were then followed up with a phone interview to inquire about the qualitative aspects of portfolios.

The primary findings concluded that undergraduates could compete well with those who had professional experience or held advanced degrees by improved graphic quality of their portfolio. Specifically, the overall portfolio layout and the imagery itself were considered essential in order to pass the “flip test”. Elements of critical portfolio importance were hand and computer graphics. While professional and academic projects were deemed very important. Process images and writing samples were only considered important.

In conclusion, the ability of portfolios to successfully communicate the undergraduate student’s abilities is essential to the hiring process of most potential employers. More specifically, the graphic quality and how that material is presented play an essential role in whether or not an employer seriously considers a student candidate or not. Instructors need to provide the means and the opportunities for students to produce portfolio worthy graphics for students. This poster will illustrate the findings of the questionnaire as well as successful and unsuccessful examples of undergraduate portfolios.
Exploratory Physiocartographies of Place and Time

Joni M Palmer, Independent Scholar, United States, joni.palmer@colorado.edu
Paula Horrigan, Cornell University, United States, phh3@cornell.edu
Kathy Kambic, University of Colorado at Boulder, United States, Kathleen.kambic@colorado.edu
Joern Langhorst, University of Colorado Denver, United States, joern.langhorst@ucdenver.edu
Caroline Lavoie, Utah State University, United States, caroline.lavoie@usu.edu
Chip Sullivan, University of California, Berkeley, United States, csully4@yahoo.com

Keywords: communication, drawing, education, place, spatial, temporal

Sketching and the resultant sketch act to both create and chronicle direct encounters with landscape and place. Sketching triggers and maps a heightened consciousness, an imaginative perception and awareness in which perception, interpretation and reflection simultaneously integrate and enfold (Lavoie 2005).

For landscape architects and designers, sketching remains a critical form of exploring, disclosing and representing the lived and experienced world. Sketching provides a window into a world that is always already there and also, always in the process of becoming, morphing and transforming. Sketches become, for their authors, real-time investigations that at once, relate direct sensorial experiences of landscape, topography and place and also chart unseen and emerging concepts, attitudes and possibilities. Bill Gilbert (2009), uses the term physiocartography to describe drawings that capture intensely individual experiential and abstract encounters and interpretations of landscape. Like Gilbert’s physiocartographic representations, drawings powerfully and persuasively ‘map’ and translate experiences reminding us, in Catherine Ingraham’s words, that “The humanist world is mapped rather than constructed” (1996).

For CELA 2013 we propose a presentation in three Acts:

1. Pre-Conference Workshop: Physiocartographic Perceptions. A maximum of 24 people must register for this pre-conference workshop/real-time sketch crawl scripted to unfold through Austin’s urban landscape. Moleskine will sponsor the crawl and is offering each participant a Japanese sketchbook.

2. Exhibition of Work: Physiocartographic Reflections. Participant’s sketchbooks will be shared with the larger CELA conference at a gallery venue either on or off site. The resulting sketchbooks and their drawings, along with the experience of the participants, provide a living record to accompany the presentations and discussion occurring in the proposed conference session.

3. Conference Panel Session: Physiocartographic Interpretations. Six panelists will use scholarly sources as well as their own drawings, and those of the sketch crawl participants, to discuss sketching and drawing’s role in mapping and disclosing landscape perception, interpretation and reflection (60-90 minutes).

Exploratory Physiocartographies of Place and Time engages the “Space Time Place Duration” theme and asks participants to consider ways we visually interpret and translate experienced conditions of space, time, and place when we sketch and draw. Taken together, the sketch crawl, exhibition and panel aim to provoke dialogue and exchange about the role of sketching and drawing in engaging and revealing the spatial and temporal complexity, depth and possibility of landscape and place.
FARMwork: Efficient, Productive, and Responsible Agricultural Systems

Katherine Lloyd, Clemson University, United States, kmlloyd@clemson.edu  
Paul Russell, Clemson University, United States, russel5@clemson.edu

Keywords: agriculture, economics, sustainable design, farmers, land management

In response to threats to the American rural landscape and community, as well as inequities in global food supply and distribution, “FARMwork” is concerned with reintroducing the next generation of American citizens to small-scale agricultural food production. This process responds to the need to better manage undeveloped rural lands, particularly those surrounding metropolitan areas, in an environmentally responsible and economically productive manner. The result should help to create a relevant, diversified, and sustainable system of people, plants, and animals within rural America while producing food for a growing population.

In 2007, the average age of the American farmer was 58, with each farmer being capable of feeding 155 individuals, annually (USDA, 2011). In addition, as much of the nation urbanizes, rural regions across the country are losing population and land mass. This is partially due to high unemployment rates and lower income. Through a case study approach, fifteen Southeastern farms will be analyzed to determine the resources, groups, and relationships of their unique agricultural regimes. Direct interaction with agricultural practitioners provides insight about the best practices of farming systems, while targeting the key motivations for people who practice sustainable farming. By understanding the motivations of existing farmers, the research implications can better address how to encourage future farmers.

There must be a balance of resources coming into (import) and leaving (export) the farm. This balance should apply to finances, cultural investment, natural resources, energy, as well as water and soil. By composing a network of institutional and commercial partnerships, interdependent farming techniques, as well as holistic cultural amenities, I will define the economic and environmental benefits of efficient, productive, and responsible agricultural systems. The result is a workable model that can be used to retrofit the rural landscape in order to protect undeveloped rural areas, natural resources, and wildlife, while producing food, energy, and capital in order to support and sustain our diverse ecosystem.
Freehand Renaissance: Concept Sketching for a Digital Age

James Richards, University of Texas at Arlington, United States, jrichard@uta.edu

Keywords: representation, drawing, creative process

Concurrent with the rise of stunning digital technology and computer imagery, online groups dedicated to freehand sketching are proliferating at a rapid pace. Demand for hand drawing workshops is growing. On-site charrettes requiring quick sketching of rapidly evolving ideas have become the norm in town planning practice, and the rapid freehand story-boarding techniques of film-making are finding their way into the creative processes of forward-thinking urban designers (Koeck, 2012). It’s been said we’re witnessing a pendulum swing from over-saturation with digital imagery to a new found appreciation and market for the immediacy and freshness of hand drawing. The Freehand Renaissance is upon us.

But to be a potent creative tool, freehand design drawing must be rethought for a digital age (Treib, 2008). Shorter time frames, tighter budgets and on-the-spot collaboration call for rapid professional working methods. The need for speed and on-location results often preclude finished computer renderings and models, and have quickly outpaced the profession’s traditional, labor-intensive “hand graphics” and rendering techniques (Richards 2007). In essence, the changing nature of projects, project work flow and advances in digital rendering are pushing freehand design drawing into a new phase of evolution, wherein less rigid and more accessible sketching styles influenced by allied creative disciplines and applicable to both traditional media and digital tablet technology can be appropriate and effective tools (Richards 2013).

This session will present and discuss approaches and techniques that have evolved over seven years of urban design projects and charrettes, and the influences of interactions with reportage illustrators, product designers and filmmakers on these ideas and methods. Working with faculty and students through teaching of invited workshops across the United States and abroad has heightened awareness of the uniqueness of this approach, and suggests opportunities for moving applied theory from private practice to academic practice.
Games + Making + Learning: Landscape Architecture Revealed

Christopher Marlow, Ball State University, United States, marlow@bsu.edu

Keywords: Games, Making, Immersive, Interdisciplinary, Learning

The purpose of this paper is to present an account of the teaching and learning that happened through an immersive (student-directed), interdisciplinary Landscape Architecture (LA) elective course on game design. It features an ongoing study on making games to foster good contemporary learning, challenging traditional LA education to embrace games as a means to inspire better teaching and learning, and contributing to the general lack of investigation of video games in environmental design education.

Originally presented at the CELA 2011 Annual Meeting, the first pilot elective yielded encouraging results that suggested continued exploration and further study. Now two years later, and with even more compelling outcomes, this paper celebrates the second iteration of the course. It was carried out with the help of 15 talented students from seven different disciplines, with ASLA as the client. The primary course outcomes included a non-digital game prototype, a video game prototype, and a game design document. Student learning was assessed through those, as well as reading and writing assignments, playtesting with faculty and the target audience, and survey questions that gathered initial baseline data and final course reflections.

Although this study does not demonstrate convincing statistical significance, it does present a persuasive account of the educational impact this distinctive course had within a notable LA curriculum. Specific highlights include two special video game prototypes – one focused on storm water management and the other celebrating brownfield remediation – and corresponding course and game design methodologies.

Although generally successful, LA design pedagogies have been relatively unchanged for decades. In particular, casual observation in recent years has revealed the desire to see our students more engaged and enthusiastic, striving for higher levels of achievement, working more with interdisciplinary teams, and guiding more of their own learning. Strong evidence suggests that making games has great potential to stimulate traditional pedagogies and foster student learning, provide an enriched and supportive venue for learning about current LA practices, and make teaching and learning more fun, meaningful, and memorable. Simply put, LA is among the most ideally-suited disciplines in the world for integrating games to augment and energize learning.

Upon completion of this presentation, attendees will have learned (1) what students learned about LA, (2) how game design and environmental design are alike, (3) how immersive learning and interdisciplinary game design teams were successful, and (4) why making games is important to teaching and learning in LA.
Landscape as Iconography

Tim Freitag, Clemson University, United States, tfreita@clemson.edu
Paul Russell, Clemson University, United States, russel5@clemson.edu

Keywords: icon, iconography, image, minimalist, modern

Can the essence of a landscape be represented in the same manner that a piece as complex as a motion picture can be distilled into a poster? The Purpose of this study was to categorize and distill personal impressions, following an intensive field trip to New York and Boston, with stops in between. Posters emerged as a logical and compelling medium to express memory and impression. The form, in specific, takes after popular minimalist poster designs for movies. The concept was to explore whether the spirit of place, materials and history of landscapes could be diagramed at the same level of iconography as a film. The challenge then was to communicate overarching ideas as well as detail. This dual nature again draws inspiration from landscapes themselves, given that a graphic nature and rich detail have long been recognized as important elements of good landscape design.

A series of twelve posters were produced, each corresponding to a site visited on each day of the trip. The intention is that someone who has visited these sites could name them based on the poster’s image alone, without needing the accompanying title. In the same way that a person who has seen a movie may recognize its corresponding poster despite its seemingly limited information, this poster series sought to achieve the same level of cognitive interaction with person experience. In the end, it is an examination of the balance between the universals in design and individual understanding.
Making Climate Change Visible: The Role of Landscape in Reframing Community Perceptions of Climate Change and Carbon

Stephen Sheppard, University of British Columbia, Canada, stephen.sheppard@ubc.ca  
Olaf Schroth, Sheffield University, United Kingdom, olaf@gmx.de

Keywords: Climate change, perceptions, behaviour change, eco-revelatory design, landscape signals, visualization, future visioning

Carbon dioxide is invisible and the prevailing images of climate change in the media are of polar bears and melting ice-caps. Scientific sources of information on climate change are often abstract and veiled in future uncertainty. The invisibility, remoteness, and abstraction of climate change is often cited as a reason why there is so little action (e.g. Moser and Dilling, 2007). This implies that making climate change more visible and tangible, closer in space and time, can motivate people toward climate action.

This idea is explored through a Community Awareness to Action Framework, describing how seeing and recognizing climate change in local landscapes may influence community attitudes, motivation, and behaviour. The C2A Framework, laid out in a new book “Visualizing Climate Change” (Sheppard, 2012), draws on environmental psychology, landscape planning and design. It argues that exposure to local evidence of climate change can triangulate what people know generally about climate change; this combination of place-based seeing and knowing (Carlson, 2001) may bring the reality of climate change home more meaningfully. The framework applies not only to recognizing the threats of climate change which dominate public discourse, but also more holistically to its causes (carbon emissions) and future solutions (adaptation and mitigation) in the community.

This paper summarizes emerging evidence to support the Community Awareness to Action framework, through three case studies addressing real and virtual visual imagery: 1) a broad review of the visibility of climate change in local landscapes (Sheppard, 2012), supported by recent findings on the impact of exposure to extreme events and community-wide climate action eg. solar installations; 2) analysis of the use of thermal imagery in motivating household and neighbourhood retrofits (Cote et al., 2013); and 3) evaluation of the impact of visualization media showing future climate change, mitigation & adaptation within visioning processes (Schroth et al., 2011).

These studies suggest that that climate change, holistically defined, is not in fact invisible in many communities; but that visual literacy and observational and foresight skills need to be strengthened if people are to ‘connect the dots’ to collective actions in the community. The paper suggests how climate change can be made more visible through deliberate design (‘landscape messaging’), building on concepts of eco-revelatory design (Haag, 1998), sustainable landscapes (Thayer, 1994), and cues to care (Nassauer, 1997); and through systematic community engagement processes that use defensible visualization to foster social learning, build climate literacy, and reframe future expectations.
Managing Uncertainty in the Design Process

Molly Oliver, Pennsylvania State University, United States, mao219@psu.edu
Brian Orland, Pennsylvania State University, United States, boo1@psu.edu

Keywords: Uncertainty, Green Infrastructure, Chesapeake Bay Watershed, Decision Making, Conflict

The Chesapeake Bay Watershed suffers from stormwater management issues which are costly to manage via traditional methods. Nevertheless, Green Infrastructure, which is widely believed to be an economical alternative, and which has proven economic, social, and environmental benefits, is minimally implemented. This research argues that this phenomenon is due to uncertainty. Uncertainty is “a situation in which there is not a unique and complete understanding of the situation to be managed (Brugnach et al. 2008, p 4).” As case in point, there will be an exploration of the uncertainty of six stakeholders involved in the Environmental Protection Agency funded project, Sustainable Chesapeake Research Centers, Center for Green Infrastructure and Stormwater Management. “The Center will conduct well integrated, interdisciplinary research to understand and influence how decisions are made at multiple levels to improve planning, design, adoption, and the successful and sustainable implementation of innovative stormwater management systems to protect and restore the Chesapeake Bay (EPA Grant R835142).” Uncertainty will be analyzed through interview analysis and storytelling. Based on the analysis, suggestions will be made for future watershed management strategies.
Mapping the legacies of lost waterways in Chinatown, New York

Elisabeth Clemence Chan, University of Oregon, United States, chan@uoregon.edu

Keywords: mapping, Chinatown, New York, buried streams

This paper describes an ongoing creative project dedicated to unearthing and narrating invisible histories of New York City’s Chinatown. The work is a series of hybridized maps and sections that examine four centuries of change. The purpose is to seek and understand the multiplicities of history at play on a site in one of contemporary New York City’s lowest income neighborhoods, Chinatown. This district is built around and above Lower Manhattan’s only, and now buried, freshwater pond. Of particular interest is the trajectory set between 1800 and 1811 when the 60-foot deep, spring fed, “Collect Pond” was filled, and the adjacent salt marshes and estuaries were drained through canals to the Hudson River and East River. The hand drawn maps I make have shown that one can trace the disparities in housing and recurring waves of settlement and displacement along topographic and hydrologic lines. I employ overlay drawings and hybrid maps to seek and link the complex relationships and processes that have persisted over 200 years. The project has two primary threads of significance, each related to sustainable design, but in very different ways. First, understanding the correspondence between dramatic biophysical changes, namely the draining and filling of major hydrological features, and centuries of place-based cultural identity can inform future design decisions in urban development. Second, the work raises the consequences of lost pasts in urban narratives. Today the site of Collect Pond, which was once the center of the 19th century slum known as Five Points, includes Columbus Park, and New York City’s current civic center. This banks of the former pond are fringed by low income housing and tenements which make up the spine of Chinatown. The story of this landscape is absent from the landscape itself. Yet this absent narrative is about the key constraints from history that have shaped what the place is today. This project seeks to address the problem that when the history of the place is silenced opportunities for positive change are lost. A major premise of the work is that without the site’s narrative present, the 21st century layer of this landscape will be compromised. This work seeks to reveal the history, and apply that history into projections and ideas for the future of New York City’s Chinatown district.
Motion Pictures: Drawing While Moving

Kenneth Helphand, University of Oregon, United States, helphand@uoregon.edu

Keywords: drawing, maps, transportation

As J.B. Jackson has noted a landscape can be “comprehended at a glance.” How is that glance documented? Photography that freezes time and space is the most common convention, but what of drawing? It is an article of faith that the act of drawing forces you to be stationary and focus your attention. It is commonly thought, although it is a much debated proposition, that duration enhances the experience, if not the result, that more time can lead to greater insight. But what of drawing where the artist is in a stationary position but is simultaneously in motion? What of drawing from a vehicle, as a passenger on a train a plane or boat? Each of these contemporary modes of transportation is associated with distinctive landscape experiences and capturing that in drawing is a challenge. The experience of doing so can offer unique landscape insights. From a ferryboat moving at 25 knots, you gaze at a near or distant shoreline. From an American train moving between 50 and 80 mph the view is slightly elevated above ground level, perhaps to the horizon, but speed blurs the foreground focusing attention on the middle and distant scene in an unfolding panorama. In commercial aircraft at speeds approaching the sound barrier there is little sense of movement, but there is a map like perspective from miles high, as well as distant views of hundreds of miles.

Landscape Architects have experimented with capturing the movement, be it crowds, clouds, or traffic. Think of the notable motation studies by Halprin of Appleyard, Lynch and Meyer’s, The View from the Road. There is a long history of maritime artists drawing landscapes from the sea as an aid to navigation and cartography. There are magnificent renderings of trains and ample guidebooks, but fewer views from them. Le Corbusier and Aalto drew from the air and for J.B. Jackson the aerial viewpoint offered a peerless platform for insight as it has for cartographers, archeologists, scientists and more. Such practices offer significant rewards in terms of information and landscape understanding. This presentation discusses the landscape experiences of these transportation modes, illustrates the history of drawing from each and illustrates the author’s graphic experiments from planes, trains and boats. All of the author’s drawings were done in real time, drawing motion pictures en plein air.
On "Floating and Falling:

P. Richard Perron, University of Manitoba, Canada, perron@cc.umanitoba.ca

Keywords: video, art, garden deign, new media experimentat

On “Floating and Falling” “Floating and Falling” is a video/performance garden artwork being developed by artist videographer Alex Poruchnyck. This paper traces the artist’s garden building project and his experiments integrating video directly into his deliberate engagements of place. Poruchnyck gradually carves out a series of fractal paths into a dense forest, meandering and pausing in the creation of an alveola like structure, a network of “dead ends” where one can pause and appreciate the forest’s own narratives. In this work the landscape is considered to be the actor in the performance, where the camera is embedded into the landscape recording the floating and falling of the “subject”. The work includes a number of experiments new media devices. Cameras are embedded in trees recording them falling to the ground or float with them in the wind. Cameras are embedded into forestry equipment record the process of human engagement with the forest. Remote controlled flying cameras track the forest change through time. 3D video cameras are used to record the spatial changes in the emerging garden. Finally the artist experiments with ideas regarding video projection within the forest itself.

Learning outcomes is on the one hand about the landscape design through a direct engagement with place, and includes a discussion about the use of new video techniques and possible applications for landscape architects. For example, in researching this paper I began to learn how to use the remote controlled flying cameras and to understand their potential as a way of studying sites from above, and of moving through a site in ways that are often not possible (this lends itself to new forms of visual simulation). In another example the use of 3D video presents the user the ability to “enter” spaces like never before. Post-production 3D video tools are providing new ways for designers to “affect” spatial ideas.

Methodologically this is a form of case study research examining content, product and process with a primary focus on temporal processes. In Richard Foqué’s recent book Building Knowledge in Architecture he argues for the use of case studies as a means of building a body of knowledge appropriate to architectural disciplines (also see Groat, 2002; Zeisel, 2006). According to Foqué case study research can be used to establish a knowledge base for the discipline while contributing to the body of architectural design theory and the body of knowledge regarding design processes.
Reasserting the Temporal: Landscape Architecture and the Cinema

Austin Allen, Louisiana State University, United States, austina@lsu.edu
Joern Langhorst, University of Colorado Denver, United States, joern.langhorst@ucdenver.edu
Reece Auguiste, University of Colorado at Boulder, United States, reece.auguiste@colorado.edu
Susan Cathleen Gunn, University of Colorado Denver, United States, susan.gunn@colorado.edu

Keywords: Temporal and Spatial Scales, Cinema, Representation

Landscape and place have been posited as products of complex human and non-human systems, processes, forces and factors, interacting over time (Allen 2001; Corner 1999; Ingold 1993; Tuan 1977). Change, on many different temporal scales, is one of the main characteristics of place and landscape – from geological processes and ecological succession to seasonal change and movement through space. However, Western modernist thought has privileged the spatial over the temporal, and consequentially spatial design and planning disciplines have been primarily concerned with form, at the expense of process. More recent scholarship has emphasized process over form, performance over appearance, and in general concerned with interpreting and instrumentalizing landscape and place as an agent of social, cultural, economic and ecological change (Corner 1999; Cosgrove 1998; Mitchell 2001). As landscape architecture relies heavily on representational media and techniques, and the temporal qualities of landscape have mostly not been adequately addressed through traditional, static modes of visualization, dynamic media, such as film, hold significant promise in reasserting the temporal and processual into intentional environmental change.

Landscape architecture, much like filmmaking, is concerned with the construction of an experience. Yet, landscape’s historical association with a theatrical setting (Jackson) and the traditional focus on appearance, set-like pictorial affordances, along with its spatial-material aspects, account for an uneasy relationship with the temporal. Contemporary discourses that attempt to critically investigate change and the interaction of human and non-human processes over time as a key quality of landscape are interested in film’s capacity to represent and deconstruct time-space relationships. Panofsky (1967:18) wrote that film had the capacity to create a “dynamization of space and, accordingly, spatialization of time”. In this context this panel endeavors to explore the relationships between movement, duration, spatial and temporal scale, emotion, memory, and meaning in the cinema’s imag(in)ing of place and landscape through the creative control of time and space, using examples from popular and independent cinema. Joern Langhorst will discuss film’s ability to manipulate the linear flow of time, investigating films by Alberto Cavalcanti, Dziga Vertov, Alain Resnais, Christopher Nolan and Steven Arthur; Susan Gunn will explicate the theoretical contributions of avant-garde filmmaker Maya Deren; Austin Allen will provide a Digital Essay on the historical evolution of the Open City; and Reece Auguiste will explore globalism defined as synchronous time across different locations as portrayed in the movie Babel (2006).
Representing Time and Space: DIY investigations

Cesar Torres-Bustamante, Cal Poly San Luis Obispo, United States, ctorresb@calpoly.edu

Keywords: spatiality, temporality, video, animation, space, 3D, anaglyphs

‘Spatility’ and ‘temporality’ are some of the phenomenological characteristics of landscape that present the greatest difficulty for landscape architectural drawing [1]. The enormity of the landscape cannot be represented without reduction or subtraction: its vast immensity imposes restrictions for its depiction in a Cartesian geometry. The experience of duration and unfolding of events also resists illustration by subdividing temporality into infinite sequences: a static snapshot is nothing more than a frozen moment in time, deprived from a flow of befores and afters.

Today’s fascination with visual and moving images claims a three-dimensional depiction and experience of space and time by bringing them as close as possible to everyday perceptions. Visualizing a place should convey an impression similar to photography or cinema, and realistic simulations of this kind not only require appropriate technical facilities but also trained graphic design specialists, resulting in a considerable investment of time, money and effort [2].

This paper will present the findings of implementing simple and inexpensive methods for recreating lifelike experiences of three-dimensional space and lapsed time in a technology class. In the first case, computer perspectives were created by using the conventional depth simulation with convergence and atmospheric perspective[3], and the experience of three-dimensional space was achieved through two offset stereoscopic images seen through anaglyph spectacles. Students learned the anaglyph principle by replicating depth in site analysis photographs, and later simulated it in their own constructed perspectives. Images were edited in Adobe Photoshop to produce two differently filtered colored images that were perceived as a three-dimensional scene when seen through paper anaglyph filters (red and cyan glasses).

The use of video in landscape offers a new form of thinking that integrates the travelling continuum of space in time, instead of immutable frames [4]. Students were able to create videos by panning frame-by-frame animations, make more evident processes that would normally appear subtle, and transforming imperceptible changes into a smooth impression of motion. This technique is generally used to document celestial motion, plants growing or the evolution of a construction project, and requires very precise motorized camera dollies. This paper will present student videos made by attaching cameras and iPhones to egg timers, resulting in investigations that not only offered a more complete understanding of the multiplicity of phenomena, but that helped students change preconceptions about their sites.
Space, Time, Place, Duration: Geospatial Framing and Sensing Identities of Landscape Architects

Hala Nassar, Clemson University, United States, hnassar@clemson.edu
Robert Hewitt, Clemson University, United States, hewitt@clemson.edu
Geoffery Taylor, ESRI, United States, gtaylor@esri.com
Brooks Patrick, Sweden

Keywords: crowd sourcing- geospatial, landscape, identity, social media

As Web 2.0 applications increasingly generate user-centered content and exchange, through social media, new evaluative methods are describing the relationship between the individual, community and landscape. Healey describes these relationships as “a social process of making meanings, shaped by ...values of particular social groupings.” This paper presents findings from social media-based analytics that geo-locate social media clusters of architects, landscape architecture, and planners throughout the United States as a means of describing the emerging values of these socially related and mediated groups. Three crowd-sourced surveys were conducted over a period of one month that identified tens of thousands of users and their topical interests according to professional affiliation. The social media user’s topical interests were analyzed according to the lexicographical content of their self descriptions. The lexicographical analysis followed framework and sensemaking methodologies identified by Fiss and Hirsch as a means of defining contemporary geo-located discourse among the three professions.

Preliminary findings from the crowd-sourced surveys suggest that:
• Each professional group has distinct identities defined by disproportionate mixes of similar topical interests.
• Professional identities in social media cluster around urban multi-centered geospatial groupings, and peri-urban groupings
• Social media users that identify with either two or all three disciplines are more clustered around urban centers, while users in peri-urban areas are more likely to identify with one group but share the topical interests of two or more groups
• Social media users identified with these groups exhibit unique values associated across their different urban multi-centered geospatial groupings

The findings offer valuable methods for geospatial and lexicographical delineation of professional population identities, and provide important base definition of regional similarities and differences between landscape architects and related, often competitive professional groups. These findings are potentially useful to landscape architecture education programs as base date for regional, interdisciplinary, and educational research related to curriculum and professional development.
The Impact of Sound on Environmental Experience: Do Multimodalities Improve Spatiotemporal Landscape Understanding?

Mark Lindquist, University of Sheffield, United Kingdom, mark.lindquist@sheffield.ac.uk
Eckart Lange, University of Sheffield, United Kingdom
Jian Kang, University of Sheffield, United Kingdom

Keywords: Environmental psychology, Landscape experience, Perception, Soundscape, Virtual reality

To date little empirical research has been conducted on the impact and effect of multisensory, and cross-modal, aural-visual interactions on landscape experience. For design and planning purposes landscape is conventionally communicated statically via one modality (i.e. visual) due to the primacy of visual information processing by the brain (Lange & Bishop, 2005). There is evidence that engaging senses beyond the visual can enhance the communication, perception and understanding of landscape and landscape dynamics. Theoretical and empirical streams have converged to the extent where current mutually exclusive sensory relationships can be challenged as a way of engaging with landscape. The importance of experience on the impact of landscape perception and character has been identified in a growing body of recent research (e.g. Scott, Carter, Brown, & White, 2009). Specifically sound has been shown to have a significant impact on landscape values (e.g. Carles, Barrio, & de Lucio, 1999), though rigorous studies are limited.

This paper presents preliminary results of exploratory empirical research investigating the impact of sound on the perception of realism of landscape visualizations, and preference for the landscapes visualized. The experiment used a 3 (visual) x 4 (aural) factorial design; visual stimuli were static images from three views of one park in Google Earth at low, medium and high levels of detail (i.e. terrain; terrain, buildings; terrain, buildings, vegetation). Aural stimuli were three on-site recordings, from the same site as the visual stimuli, that exhibited differing physical and psychoacoustic characteristics (e.g. low, medium and high loudness) and sound content (anthropogenic, natural, and mechanical), as well as a ‘no sound’ condition. The study used an online survey to deliver aural and visual stimuli and to collect psychological responses in the form of self-reported preference and realism measures. The hypotheses were that introducing soundscape to a digitally represented landscapes at low, medium and high levels of detail, will increase perceived realism of those visualizations when compared to no sound, and that preference for that landscape will be negatively affected by mechanical sound, and positively affected by anthropogenic and natural sounds. Preliminary results suggest, however, a more complicated relationship between preference, realism and the ‘fit’, or congruence, of the aural and visual stimuli. The results are considered to asses how sound can impact landscape preference and spatiotemporal understanding. The paper concludes with a discussion of the impact on designers, planners and the public, and targets future research endeavors in this area.
The Role of Visual Imaging in the Planning/Development Process for Three Wind Farms in Colorado: Case Studies - Two Built One Denied

Elizabeth Mogen, Colorado State University, United States, e.mogen@colostate.edu

Keywords: wind farms, visual assessment, planning and development process

Visual imaging is a powerful tool used by developers to inform the public of the impact a proposed wind farm would have on the landscape and could mean the acceptance or rejection of the project. Today’s modern wind farm can easily consist of over 150 turbines with towers reaching over 400’ tall topped off with a whirling 250’ diameter pin wheel. Preliminary studies have shown that visual impact has been a source of contention in the development of wind farms internationally and in the United States. Ontario, Canada rewrote planning codes to reduce the importance of visual impact for wind farms and stream line approval. In New Zealand, wind farms have been routinely referred to their “Environmental Court” and in Massachusetts the Cape Wind off-shore wind farm was delayed for years; in both situations visual impact was the primary concern. The focus of this paper will be to compare the use of visual imaging in the development process of three wind farms in rural Colorado. They represent early development (Colorado Green completed in 2003), recent construction (Cedar Creek 2008), and recently denied (Silver Mountain 2011). A telephone survey was conducted of county planners involved with each project and submission materials were reviewed. First it was established whether visual assessment studies were required or provided by the developer voluntarily. Although the approval processes varied by county and none did required visual impact studies, visual imaging was used during public hearings and within general impact statements. Also noted were the type of images used and the manner and circumstance in which they were presented. To further establish the specific methods used a secondary phone survey was conducted with the developers or the associated group providing the visual study and images. For the Colorado Green project large scale photos were used at public hearings and as displays in public venues. For the Cedar Creek project, images were imported into power point for presentation at public hearings, open houses and public works staff meetings extensively before the application was submitted. Although a visual impact study was part of the submission for Silver Mountain only large photos were used at one public hearing and one open house. The intent of this study is to provide information that will help those involved in wind farm development understand the most effective and constructive use of visual imaging in terms of timing and method within the approval process.
Design Education & Pedagogy
A Paradigm Shift in Design Education: Harbeson and Albers in the Studio

Carter Crawford, North Carolina State University, United States, carter_crawford@ncsu.edu
Arthur Rice, North Carolina State University, United States, art_rice@ncsu.edu

Keywords: history, philosophy, pedagogy, beaux-arts, bauhaus

This paper is a part of a larger study that is developing an intellectual history of American design education. An important episode in that history was the revolutionary paradigm shift in the 1930s when the Beaux-Arts system was replaced as the dominant pedagogical approach by the modernism of the Bauhaus. How did the activities of students change as a result of the shift? How did those changes reflect the attitudes of the competing systems in relation to history, critical thinking, knowledge, and creativity? How do the legacies of the respective systems affect current pedagogic practice in design education?

The paper compares two learning environments: the architecture department at the University of Pennsylvania during the Beaux-Arts years, and the American classroom of Bauhaus master Josef Albers (referred to by Bauhaus founder Walter Gropius as “the very best teacher I could imagine” (Gropius, 2007)). Albers immigrated to the United States after the demise of the Bauhaus in 1933, where he taught first at Black Mountain College in North Carolina and later at Yale University.

The Beaux-Arts system as taught at Penn is detailed in John Harbeson’s Study of Architectural Design, “as it was adapted and refined to suit the structure and demands of American departments and schools of architecture” (Blatteau, 2008, p. xi). In addition, there are a number of accounts written by Penn students and faculty during the era. Though Albers did not write extensively on his teaching method, we are fortunate to have in the State of North Carolina Archives and elsewhere excellent student class notes from Black Mountain and Yale that, along with other materials written by students and others about Albers as a teacher, provide a clear picture of his methods.

The results of the study reveal and clarify fundamental differences in the systems, commonalities between them, and apparent contradictions between their stated goals and their pedagogical practices. The results also provide glimpses of the philosophical origins of current practice; while much of our current thinking is a direct descendant of Bauhaus modernism, a surprising amount of the style of thinking that characterized the Beaux-Arts survives as well. It is hoped that the study will serve to further stimulate informed conversation about the present state of design education and about its future.
Achieving Excellence in Design Studio Teaching: A Panel Discussion

**Patrick Mooney**, University of British Columbia, Canada, pmooney@sala.ubc.ca

**Blake Belanger**, Kansas State University, United States, belanger@ksu.edu

**Keywords**: Design Studio Teaching Methods

The recent CELA Strategic Plan states as one of its core goals that: “CELA will serve as a resource for members to become better educators and help advance careers” and that CELA will create and publish best practices for teaching and learning. The intent of this panel is to assist CELA members in becoming better design studio teachers by sharing the teaching philosophies, and strategies of three excellent studio educators recently recognized by CELA for excellence in design studio teaching. The panelists will discuss three prepared questions and will participate in a discussion with the audience during a 50-minute panel discussion. To develop the prepared questions, the moderator will begin by conducting non-directive interviews with the three panelists. From these interviews, the proponents (the moderator and one of the panelists) will develop a set of potential questions for the panelists. The panelists will then be asked to select their top five questions for discussion at the CELA Conference. From this list, the top three questions will be selected for panel discussion at the CELA Conference.

Format: Following a brief introduction of the panelists and the purpose of the discussion, the moderator will introduce the first question. The panelists will know the questions in advance and will give short prepared answers. Before moving on to the next question for the panelists, the moderator will open the discussion to questions from the audience for five minutes. This process will be repeated two more times during the 50 minute period. The moderator will close with a short 2-3 minute summary of the discussion and thank all of the participants. The proponents intend to develop a paper based on the panel discussion for publication in the CELA Conference proceedings. We hope to find commonalities in teaching philosophies and/or strategies among the panelists that indicate key aspects of successful design studio teaching and learning in landscape architecture.

The panelists are: Blake Belanger, Assistant Professor Kansas State University and 2012 CELA Excellence in Design Studio Teaching - junior level award winner; Hala Nassar, Associate Professor, Clemson University and 2011 CELA Excellence in Design Studio Teaching - senior level award winner; and Roberto Rovira, Associate Professor and Chair of Florida International University’s Landscape Architecture Program, Principal of Studio Roberto Rovira and 2011 CELA Excellence in Design Studio Teaching - junior level award winner. The moderator will be Patrick Mooney, Associate Professor University of British Columbia, Landscape Architecture Program.
Amplifying Scope, Accentuating Sequence: Landscape Architecture and Urban Design in an Architecture Curriculum

Natalie Yates, Washington University in St. Louis, United States, yates@samfox.wustl.edu
Patty Heyda, Washington University in St. Louis, United States, heyda@samfox.wustl.edu

Keywords: studio, landscape, urban design, architecture, design, methods, mapping, video

The College of Architecture in the Sam Fox School at Washington University in St. Louis which has included a program in Urban Design for the past 50 years, expanded their offerings to Landscape Architecture in 2010. Last spring, the school embarked on the first co-taught, trans-disciplinary Urban Design and Landscape Architecture studio option for advanced undergraduate Architecture students. Through our collaboration and using the lenses of urban design and landscape architecture, we explored alternative methods of studio teaching using exploratory, interactive, non-linear approaches. We introduced film for a more immediate capture of place; the visual was expanded to include audio and textural. Where drawings usually fall short, our students were able to understand meaning through residents’ voices. Time, scale, policy and ecology became intrinsic to developing vocabulary, techniques and design methods, and ultimately became instrumental to the studio’s success. The studio became a valuable example of reframing design education, suspending purely aesthetic in order to gain a deeper reading of the site.

In this article we will discuss the disparities between backgrounds and development of a common design vocabulary, describe methods introduced to the studio that provided opportunities for dialog, and analyze the outcomes through project examples and student experiences. We will also compare the processes and products of this studio with previous, more traditional studios that rely solely on drawings as analysis. Methods presented will include examination of collaborative/large group dynamics, mapping techniques of histories, policies, and physical systems, the introduction of video/film as time-based, experiential analysis, and revision of the standard design critique style.

The studio grew out of the vision of the College to transcend boundaries of the various disciplines and to provide a vehicle for students to explore perspectives and tools for site research and design drawn from Landscape Architecture, Urban Design and Architecture. In a moment of serendipity, the studio coincided with the Pruitt Igoe Now competition that provided a wild, vegetated landscape site close to the heart of the city and steeped in urban, environmental and social histories. As a result of the methods used and the series of projects, the studio challenged students to see the site as a dynamic space imbedded in broader environmental, economic and social systems.
Analysis of the Current State of Interdisciplinary Landscape Architecture Education

Tae Seo Koo, North Carolina State University, United States, tskooo@hanmail.net
Arthur Rice, North Carolina State University, United States, art_rice@ncsu.edu

Keywords: integration, cooperation, collaboration, interdisciplinarity

Design professions are characterized by complicated, interdisciplinary problems requiring cooperation of various professionals. In contrast, design educational environments are characterized by strict disciplinary boundaries. Chinowsky and Robinson address the challenges and issues facing the design education community in the process of integrating interdisciplinary educational experiences into a traditional segregated educational curriculum.

Landscape architecture has inherently interdisciplinary characteristics as the definition of ASLA indicates that, “The science and art of design, planning, management and stewardship of the land.” In a classic study of the profession done in the 1970s by Albert Fein, he pointed out that to understand a truly interdisciplinary program remains a critical problem that has to be confronted. This problem is still yet to be resolved. Interdisciplinary design education focuses on the interdisciplinarity which integrates design disciplines to promote design solutions from diverse design perspectives. Interdisciplinary design education allows designers to communicate and solve territorial design problems by integrating and learning from each discipline.

Current approaches to design education tend to emphasize individual work, learning facts, and the analysis of artifacts. Not many landscape architecture programs emphasize integrative activities as a fundamental part of the design curriculum. A study of landscape architecture programs in the U.S. reveals that approximately 25 percent include the word ‘interdisciplinary’ in their mission statements; however, they do not actually provide an interdisciplinary program in their real curriculum. Students are not ready for the workplace nor are they prepared to collaborate well, to transfer their skills from one domain to another, to learn and to consider concepts beyond those learned in academic settings.

This study uses a web-based data collection method exploring the major components of interdisciplinary landscape architecture education. The mission statements are counted and documented to understand what they are trying to accomplish through interdisciplinary programs. The name of the program indicates their focus and direction of study and how they are coordinated with related disciplines. The actual courses forming the curricular structure are investigated. The credit hours of courses are also considered for understanding the real interdisciplinary courses compared to traditional landscape architecture courses. The name of department or college is included to articulate the departmental directions and how the actual curricular structure responds to interdisciplinary efforts. This study describes the current state of interdisciplinary attempts in the landscape architecture academic environment. It explores associated key indicators of interdisciplinary design education and barriers related to curricular structure.
Aqueduct Futures: Transdisciplinary Communication about Sustainability and Adaptation

Barry Lehrman, Cal Poly Pomona, United States, plehrman@CSUpomona.edu

Keywords: Transdisciplinary design pedagogy; infrastructure, water-energy nexus, new media, GPS

The core of the Aqueduct Futures Project is a series of interdisciplinary courses commemorating the upcoming centennial of the Los Angeles Aqueduct – a seminal public work project that is perhaps the greatest contributor to metropolitan growth in the Southwest. These courses (3rd and 4th year BSLA studios, and electives in LA, Graphic Arts, Computer Science, and Geology) are generating designs for cultural and ecological enhancement of the aqueductshed.

Aqueduct Futures courses will provide state-of-the-art transdisciplinary learning and collaborative experience for the students and faculty. The Aqueduct Futures Exhibition and the web ‘Portal’ will provide the public an innovative experience to understand where water for Southern California comes from, implications of climate change and population growth on demand and supply, and how the Los Angeles can create a resilient water supply. Other public engagement activities that are integrated into the Aqueduct Futures curriculum include student run public meetings/charrettes, developing k-12 STEM curriculum utilizing the portal. Funding to organize a symposium has been applied for.

The Aqueduct Futures Web Portal will provide an interactive user experience exploring the Space and Time, Place and Duration of the Aqueduct by utilizing cutting-edge mapping technology and interface design. Real-time and historic flow/climate data from the aqueduct and historic documents about the construction process are being translated into publically accessible graphic formats that significantly improve on cryptic numerical reports provided by most water agencies.

The portal will be accessed through: 1) kiosks at the exhibition venues; and 2) via a website/’app’ that is optimized for mobile surfing (GPS location enabled).

This session will focus on the project’s research into the learning outcomes generated by interdisciplinary interaction of the students and the transdisciplinary issues of addressing the water-energy nexus through cultural and eco-technical landscape designs. Lessons learned from the creation of web portal (and why we didn’t create an app instead) will be shared along with a demonstration of the prototype web portal.

100-160 students will participate in the Aqueduct Futures project.

Venues for the exhibit(s) receive up to 24,000 visitors/month.

The web portal will be accessible by the world.
Assumptions to Arguments: A Framework for Generative and Reflective Design Process

Allan Shearer, University of Texas at Austin, United States, ashearer@austin.utexas.edu

Keywords: argument

This paper presents a framework for identifying and linking assumptions related to design decisions. Its use in teaching is demonstrated through examples drawn from mid-level graduate studios on urban landscapes.

Problems related to environmental design are rooted in essentially contested concepts, complex systems, and competing views of assessment. As such, efforts of design do not yield unqualified solutions, but, instead, qualify arguments for possible resolution. Using the definition of argument as an explication of assumptions about perceptions and expectations, and taking the position (after CA Willard) that argument is the social basis for knowledge, argument is put forward as a basis for studio investigation.

A recursive five-part framework is used to help students recognize different kinds of assumptions and form arguments: 1) the recognition of facts and beliefs that comprise an image of the world; 2) the identification of challenges | opportunities inherent to the image that are open to modification; 3) the forming of a vision that serves as a strategy to change the current situation; 4) the defining of objectives as systems that operationalize the vision in terms of achievable priorities; and 5) the making of design decisions — locations, dimensions, and materials of objects in the built environment.

Stepping from part to part requires attention to different aspects of knowledge creation: moving between the image and challenges | opportunities requires a model of metaphysics or ontology; moving between challenges | opportunities and vision requires an understanding of ethics; moving between vision and objectives requires an understanding of epistemology; moving between objectives and decisions requires a model of aesthetics; and, moving between decisions and the image requires a model of experience.

It is recognized that the design process may begin with any of the five parts and that the moves from one part to another may happen in any order. Regardless of the starting point or direction of movement, however, each of the five parts provides a basis for generative thought, and each move between parts provides an opportunity for reflective consideration. Further, a more consistent argument for design is developed as the five parts become mutually informing and reinforcing as a logic for design.

It is offered that this "design as argument" approach can help students recognize and explicitly articulate their assumptions. This revealing of foundational assumptions provides an opening for meaningful discussion and debate. In the classroom, these structured conversations can help students understand why—and not just that—designs are different.
Balancing Learning Objectives and Online Instruction in Course Development

Christine Calorusso, Virginia Tech, United States, ccalorus@vt.edu

Keywords: online instruction, learning objectives

In recent years, supporters have heralded online instruction as a means of increasing student achievement, reducing the cost of instruction, and expanding access to higher education (e.g., Carey, 2012). At the same time, skeptics have been equally vocal in dismissing Web-based courses as a pedagogical gimmick of limited value (e.g., Carey, 2012). Somewhere in the distance between these two extremes lay the truth, but exactly where remains open to debate—and probably always will. As with any teaching method, the efficacy of Web-based courses depends to a large extent on how well they are tailored by instructors to the unique requirements of individual disciplines and courses. Although some university disciplines (e.g., mathematics) have reported success with online formats (Carey, 2012), others have struggled to adapt Web-based courses to their needs. Landscape architecture, with its emphasis on collaborative studio environments, peer learning, and site visits, would seem to fall into this latter category. The discipline is still in the early stages of exploring how online teaching can be integrated into the curriculum in ways that successfully prepare future practitioners.

This paper presents my reflections as a beginning instructor on the successes, failures, and surprises encountered in transitioning a face-to-face lecture/discussion course to an asynchronous online environment. Throughout, I compare my own experiences over five semesters with the published research on online learning. One of the fundamental complications I encountered in this process was how to achieve the course’s main learning objective: helping non-major undergraduates develop their ability to read the everyday landscapes around them through some of the lenses commonly used by landscape architects (e.g., the landscape as social space, as cultural artifact, as ecological system). With my students now scattered across the country (and even the globe) during the summer session course, I could no longer use the campus landscape and surrounding town as a learning laboratory by sending students out to engage specific sites that illustrated class topics. Nor could class lectures and discussions assume a basic familiarity with local landscapes. Although this limitation resulted in perhaps the most dramatic restructuring of the course, it was by no means the only complication encountered in the conversion process. Other issues examined in the paper include anticipating student attitudes toward and comfort level with technology, encouraging productive class discussions, providing critique and feedback, and promoting student collaboration.
Compiling in the Core; Computer Programming in the Landscape Architecture Curriculum; Apps, Scripting, Macros & Interaction

Caroline Westort, Iowa State University, United States, cwestort@iastate.edu
Stephen Ervin, Harvard University, United States, servin@gsd.harvard.edu
Peter Petschek, University of Applied Sciences of Eastern Switzerland (FHO), Switzerland, ppetsche@hsr.ch
Bradley Cantrell, Louisiana State University, United States, bcantrell@visual-logic.com

Keywords: Computer Programming, Software, Apps, Scripting, Macros & Interaction

Title: Compiling in the Core; Computer Programming in the Landscape Architecture Curriculum; Apps, Scripting, Macros & Interaction

Organizer, Moderator & Panelist: Caroline Westort, ISU

Description of Topic:
Digital technologies have become pervasive in society and drive many key innovations radically influencing interaction with the landscape. Software code is the common denominator underlying the functionality offered by CAD, GIS, GPS, Image Processing, Spreadsheets, Presentation graphics, Word Processing, Video editing, Animation, Gaming, etc. Key digital tools employed by landscape design professionals are written, or spec-ed by software developers and algorithmists, who rarely have training in landscape architecture. The panel seeks to bring together academics, practitioners, and industry representatives active in writing code for landscape design; to exchange ideas, approaches, challenges, and solutions for cultivating integration of software design training into the landscape architectural curriculum.

Rationale for Its Importance:
No landscape design curriculum currently embraces computer programming as an essential skill. Students, graduates and practitioners in our profession are too often relegated to “end users” of “black box” off-the-shelf applications, and more recently, apps downloaded from the cloud. Software tool-making has matured significantly over recent decades. “High level” coding is now possible for the previously uninitiated via use of API’s, scripts, macros, and other “click and drag” integrated programming environments, and many landscape designers and geospatial thinkers are very active using them. Should landscape architecture students be learning about variables and data types, conditionals and loops, exception handling, dynamic memory allocation? Or should we focus on “content design”? Computer graphics? The GUI? Widget control and interaction? What balance between the technical implementation and content spec-design is appropriate in a landscape design curriculum? What’s been tried before? What are the new opportunities? What would a core sequence in computer programming for landscape architects look like?

Presentation Structure:
The moderator will introduce each panelist, who in turn will offer a 10 minute presentation on the above questions – citing their specific experience. A moderated exchange among panelists would then follow. Q/A with the audience would occur for the remainder of the session. Confirmed Panelists: * Steven Ervin, Harvard GSD * Bradley Cantrell, LSU (visiting GSD) * Peter Petschek, HSR, Switzerland * Caroline Westort, ISU To be confirmed: * John Danahy, U Toronto * Hope Hasbrouck, UT Austin
Cross-Disciplinary Digital Pedagogies

Michael Beaman, University of Texas in Austin, United States, mlbeaman@gmail.com
Zaneta Hong, Harvard University Graduate School of Design, United States, zhong@gsd.harvard.edu

Keywords: design education, pedagogy, teaching, cross-disciplinary, architecture, landscape architecture, STEM, system, form

There exist a number of pedagogical approaches to considering process in a design studio curriculum. Many of these establish a bias towards either systems logic or formal logic as an operative design methodology. The systems-based approach seeks to find and exploit physical processes and temporal cycles, while the formal approach tends to advance material, spatial, visual and haptic investigations. Both of these have correlations to practice and theory. What is at stake in education is the ability to prepare students for managing and applying the complex relationships between systems and forms inherent in any constructed environment, and to do so by leveraging the computational abilities of design technologies.

As educators, our pedagogical approaches to breaking-down and demystifying complexities and relationships are part of a crucial consideration when conceiving and developing a course. The disciplines of Landscape Architecture, Architecture and Urban Design have different understandings of system and form - developing discipline-specific curricula to address each. Examining the differences in these curricular frameworks exposes a latent synthesis, which can refocus education on the relationships between system and form that cross design disciplines.

This paper will outline a pedagogical approach that exposes this latent synthesis through the incorporation of digital/computational technologies within the studio environment. Our intent is to span disciplinary differences and project new cross-disciplinary pedagogical models by explicitly working with data as a core material of design. The incorporation of digital/computational technologies early in the educational career of students provides a means for understanding how system and form are related and interconnected on a fundamental level; and in effect, generates a capacity for rigorous and clearly defined research and design processes.

This paper will outline the first attempts at implementation of this pedagogical model in both undergraduate and graduate design studios to understand the implications of this approach at various levels. Here, we will present three strategies: System - Form, Data - Material and Space - Cycle. We will also posit ways of moving forward and expanding on this pedagogy. We will examine a number of successes and failures in implementing this approach, and speculate on how we can then create paths for collaborating with non-design disciplines that also rely on data-rich processes, such as the STEM (Science, Technology, Engineering and Mathematics) disciplines, which are increasingly influential in shaping our built environment.
Design in the Data Cloud: Preparing Students to Effectively Leverage Quantitative Evidence Based Design Tools

Anna Reaves, North Carolina Agricultural and Technical State University, United States, areaves@ncat.edu
Jamie Vanucchi, State University of New York, United States, jvanucch@esf.edu

Keywords: data, quantitative evidence based design, landscape performance, LEED, SITES, LAF

Data is everywhere. Access to data and shared knowledge has exploded with the onset of the internet and improved computing capabilities. Never have designers had so much raw data at their disposal. Never have the tools for obtaining, sorting, and plotting data been so accessible (Shepard, 2011). As access to data has intensified, analysis of this information to develop quantitative evidence-based design solutions has also become increasingly important (Deming et al. 2011). This is evidenced through the 1) increased interest in developing disciplinary guidance for landscape architecture research strategies 2) development of landscape performance assessment tools and rating systems such as Leadership in Energy Efficiency and Design (LEED) and the Sustainable Sites Initiatives (SITES), and 3) the rise of organizations like the Landscape Architecture Foundation (LAF) who provide web-based resources for quantitative evidence based design knowledge.

The use of accurate data has the capacity to bring an increased rigor to landscape architecture. We will explore how students in the field of landscape architecture have incorporated quantitative evidence based findings into their analyses and/or design responses. In addition, we will offer ideas on how educators might better prepare students to effectively leverage quantitative evidence based design tools.

This study will review American Society of Landscape Architecture (ASLA) student award winning projects from 2005 – 2012. These projects were selected because they provide a consistent format, offer work samples from multiple institutions, and have been recognized as outstanding examples of student work. This assessment seeks to answer the following questions:

1) How prevalent are quantitative evidence based calculations within student work of the past 8 years?
2) What topic areas, such as stormwater, energy production, and program use were quantified, and do gaps exist in focus areas?
3) Where did students find data, was it accurately portrayed, and is the source properly cited?
4) How has the use of quantitative data impacted student design outcomes?

Findings will provide ideas on how to better improve teaching practices related to quantitative evidence based design. Initial findings indicate that quantitative evidence based calculations are becoming more prevalent in student work, are playing a significant role in student design outcomes, and gaps in focus areas exist. Results also show the need for valid data set selections by students, labeling of graphics and units, and clarity in sourcing.
Design Week: A New Approach to Integrating Student Learning and Faculty Research

Ryan Hargrove, University of Kentucky, United States, ryan.hargrove@uky.edu
Carolina Segura, University of Kentucky, United States, carolina.segura@uky.edu

Keywords: Vertical Studio, Charrette, Community, Multidisciplinary

This paper tracks a vertical studio experience at the University of Kentucky Landscape Architecture Department. The studio project was adapted to supplement a grant proposal for the TKF Foundation’s Open Spaces Sacred Places Award. Directed to develop "significant new sacred public green spaces in urban settings that demonstrate a combination of high quality design-build and rigorous research about user impacts," the project utilized a university and industry collaborative known as Design Week. For six intense days, approximately 100 students and faculty from the University of Kentucky’s programs in Landscape Architecture, Fine Arts and Healthcare partnered with professionals from Design Workshop, a planning and design firm, to develop design proposals.

The weeklong vertical studio charrette provided an opportunity for students to collaborate with planners, designers, and participants from other disciplines in a real-world setting on a real-world challenge. Developed as an event to serve multiple purposes, Design Week builds long-term relationships between practice and academia, enriches the professional development of participating faculty, and strengthens the role of landscape architecture in the community.

Similar to the traditional vertical studio system, the organization of this project allowed students of various developmental and skill levels to interact and compete with one another in a topical, research-based project. While the concept of a vertical studio is representative of Design Week, this experience was unique for several important reasons. As a design exercise the multidisciplinary community based approach was in response to a funded project that could potentially provide long-term research funding. By integrating the design studio and a multidisciplinary faculty research team, the experience offered numerous student learning opportunities including the introduction of Design Workshop’s metrics approach to practice and research. This allowed students to appreciate the purpose of the outcome and the value of landscape performance.

It is important to develop synergies among research, education and practice to establish a win-win situation for the educator and student in terms of collaborative learning (Liem, 2007). This paper will go beyond a description of the experience and offer research findings based on a participant survey. Results report the value of vertical studios on students’ design processes. The experience of this project serves to illustrate the benefits and drawbacks of this pedagogical approach and offers strategies for educators to replicate the success of this project in a variety of settings.
Digital Landforms [Surface Treatment]

David Karle, University of Nebraska-Lincoln, United States, dkarle2@unl.edu
Sarah Thomas Karle, University of Nebraska-Lincoln, United States, sthomas10@unl.edu

Keywords: Interdisciplinary, Grading, Digital Fabrication

Purpose:
This paper will describe and assess the learning objectives of an interdisciplinary workshop focused on the digital design and fabrication process to generate and implement a contoured landscape.

Learning Objectives:
1. Expand the student’s knowledge of earthmoving technologies with practical hands-on professional tours and demonstrations.
2. Help students understand opportunities and constraints associated with conceptual design and construction of landforms.
3. Utilize digital technology to analyze ecological topographies and abstract concepts for new landform strategies.

Background:
Grading, a common technical skill between disciplines of architecture and landscape architecture, is often taught from a process utilizing in-field staking from a contour-grading plan. However, technology exists in the fabrication and construction fields to change the way we think about grading design. Using 3-dimensional computer software, topographies can be developed and studied in plan, section, and perspective simultaneously. This methodology enables a 3-dimensional surface to be translated into a Triangulated Irregular Network (TIN) drawing and onto an earth moving machine’s operating system. Moving beyond the plan derived contour drawing, to a 3-dimensional drawing, provides alternative methods for viewing, representing, and constructing topography.

Methods:
The students were divided into teams of architects and landscape architects to generate a series of landform designs based on ecological processes. They were asked to visualize their landform design as contours and as 3-dimensional points in space, which could be manipulated, to create appropriate slopes. The students were then asked to analyze how their landform might evolve overtime with the impacts of wind and rain. The final phase of the project constructed a full-scale model of the grading plan on a machine testing-ground. Prior to execution the teams worked with Civil Engineers and professional landscape architects to finalize their design.

Findings:
The workshop introduced students, faculty, and professionals to a fully digital fabrication method from conception to construction. The skills gained in the workshop have influenced student grading abilities in upper level landscape and architecture design studios. The paper will discuss improvements needed, successes, and lessons learned for the workshop.

Importance:
In recent decades the digital-age has created a direct link between what can be conceived and what can be constructed. This technology has an impact on landscape architecture with computer-aided earth-moving machines sculpting the land. This technology will continue to evolve the way designers view, represent, and construct topography.
Dinner with Olmsted: Education around the Breakfast Table

Roxi Thoren, University of Oregon, United States, rthoren@uoregon.edu

Keywords: field school, food systems, integrative education

This paper describes the unique academic opportunities of immersive, residential study, through a description of a new summer field school. In summer 2012, twelve students and three faculty members lived for a month on a 400-acre property originally designed by F.L. Olmsted, Jr. The property was the hub of a set of activities organized around the theme “Sustenance” – food systems, broadly conceived. The field school comprised three classes: a design studio, a reading seminar, and a regional study course. But while each course had its own syllabus, assignments, and criteria, the strength of the program was the seamless integration of all three into an immersive course of study. The seminar began with the provocation “What did Olmsted eat?” with primary source readings from Olmsted’s attempts at farming, and a study of the historical drawings for the property. The group studied the integration of food production into a leisure landscape in the late nineteenth century, and imagined ways that integration could be re-established. The group visited conventional and organic farms, and wholesale and retail markets; redesigned the property as a productive landscape; cooked meals together; and engaged local experts in conversations on food, history, and social constructs. While key conversations, of course, occurred during the structured setting of classes, many of the more personal, revelatory, and insightful conversations happened in the off-duty moments of hikes, car rides, and around the breakfast table.

The theme of food systems is well suited to a residential study program, as readings and assignments are discussed over the daily necessity and ritual of sustenance. However, the benefits of a brief-but-intense field school extend to other topics. While we strive as educators to integrate courses across a curriculum, rarely do we have the opportunity to craft a set of courses, readings, field trips, guest lectures, and assignments that fully complement and enrich each other. While the primary focus of this paper is the month-long field school the author also presents more brief (one-week) immersive field schools, and highlights the extraordinary educational opportunities of limited distraction.
Discovering Values: Social Constructivism in Landscape Architecture Pedagogy

Jennifer Britton, Montana State University, United States, jennifer.britton@montana.edu

Keywords: Design theory, landscape architecture education, landscape interpretation, cultural landscape

Current landscape architecture education seeks to equip students with competence and confidence in designing landscapes with a primary focus to make students “work ready” (Dee 2010, Steinitz 1990); however this pedagogical approach emphasizes an exterior world of form and function, aesthetics, and environment with little attention to students acquiring knowledge towards what a culture may value or “how best to design” (Murphy 2005, 35). Given the complexity of cultural values towards landscape, we would do a better service in higher-education and to the profession if we challenged students to gain insight beyond subjective self-reflective aesthetics common in studio settings (Schön 1987). We need to develop student’s critical thinking skills in relation to the concept of landscape.

This paper examines one method to engage students in an open exploration of personal perspectives. From readings in cultural landscape literature (Meinig 1979) a studio assignment required students to communicate and interpret into visual forms their personal views of Montana’s landscape. Grounded in a social constructivist approach of adaptive process (Daniels 2001) students encountered a new type of visual design problem, an interpretive graphic display, from which they explored their own and their classmates personal values. The assignment was designed as a competition with the strongest submission becoming a permanent graphic wall wrap installation in the studio space.

Methods of assessment for validity of pedagogical approach include questionnaires, class critiques and presentations with jury, and student course evaluations. The results indicate this lesson not only helped students cultivate a deeper awareness of how personal values effect aesthetic preferences but also led to a greater sensitivity towards classmate viewpoints and a stronger sense of enjoyment in conceptual design process. These findings are important as they illustrate how philosophical pedagogical methodology has potential application to any design course where value investigation is a desired objective.
Ecological Design | Design Ecology: Integrating Ecological Thinking into Early Design Education

Ken Yocom, University of Washington, United States, kyocom@uw.edu
Julie Johnson, University of Washington, United States, jmjsama@u.washington.edu

Keywords: ecology, design, pedagogy, education

As a professionally oriented discipline, pedagogical frameworks in Landscape Architecture require approaches that teach the base skills while extending the discipline's nebulous boundaries. Similar to the distinctions between ecological restoration and restoration ecology, we define ecological design through a skills-based, practice orientation, and design ecology as the research that assists in determining the performance capacity of ecological design proposals. Inherently linked, these concepts form an integrated approach engaging students in these core issues of the discipline. Most U.S. Landscape Architecture programs actively incorporate ecology-based pedagogy in their design curriculum, yet the scope of literature available for how this is done is relatively limited (Ahern 2002; Tamminga et al. 2002). In this paper, we introduce a framework for design and ecology integration used in the initial year of Landscape Architecture studies at the University of Washington. Constructed as two integrated courses taught during the same term, a lecture course introduces students to core ecological concepts and relays their potential incorporation into the design process. Closely linked, the concurrent studio course actively utilizes these concepts through problem-based activities for design. To facilitate this integration, the faculty member teaching the lecture course also co-teaches the studio. Increasing in complexity over the term, we begin with strategies for students to identify and understand relationships between landscape form and biophysical processes and culminate in studio with a design project that engages a site's hydrological parameters.

To reduce student anxiety about the informational depth and contextual complexity of applying ecological processes to site design, the courses are taught using a narrative-development framework. Establishing a structured story approach enables the students to comprehend the details and relationships of biophysical processes for a site from a frame by frame perspective. Individually the frames provide the detail of their design so that when combined, a structured narrative that is spatially grounded and temporally relevant is developed.

The application of this framework has had mixed results. Through review of student work and student conversations we find: 1) difficulty in translating core ecological concepts and their spatial relevance; 2) incorporating the temporal qualities of biophysical processes into early design education adds a level of complexity that taxes students' form-making process; and, (3) a linear approach to narrative development can limit the creative capacity.

Drawing from these findings, the presenters wish to engage session participants in a broader discussion of pedagogical approaches and outcomes in other Landscape Architecture programs.
Educational Practice: Psychology of Pictorial Representation as a basis for Design Education

Peter Miniutti, University of Connecticut, United States, peter.miniutti@uconn.edu
Madeline Schad, University of Connecticut, United States, madeline.schad@uconn.edu

Keywords: Design, Arnheim, Gombrich, Education

Undergraduate design work often falls into the following categories: 1) ill-fated attempts at creating “natural” landscapes by imitating nature, (2) poor replicas of popular built projects, and 3) function-based design with little consideration to aesthetic/spatial forms.

Computer technologies only make this situation worse. When students become proficient with technology, designs can be thrown together without thoughtful analysis. The ease of capturing imagery can limit students’ exploration. While technology may result in visually appealing graphics, those graphics often mask designs that are neither meaningful nor memorable.

In The Necessity for Ruins, J.B. Jackson discusses make-believe landscapes void of meaning. “The parade as an art form or as a political symbol is all but dead. Like the political monument it has ceased to have any symbolical impact. But a kind of historical, theatrical make-believe is becoming increasingly popular...gradually changing the new reconstructed environments into scenes of unreality.1” Landscape architects are part of this problem, often lacking rigorous intellectual basis behind their work.

To confront these issues, I have developed a design curriculum which spans 4 different courses. A main objective of the curriculum is to use visual perception laws in the creation of form. Visual perception deals with how the eyes and brain of a person perceive their environment and create meaning. The creation of form also requires an understanding of formal compositional principles and one’s attitude about beauty. One’s attitude toward beauty and aesthetics needs exploration to allow development from a strictly personalized intuitive approach to design to an approach that allows for universal understanding and meaning. In essence, students are guided to create form with a level of abstraction which is not too high (self-centered speculation) nor too low (replicas/thoughtless imitations of objects). As Rudolf Arnheim said in his book, Visual Thinking, “any such restriction of thought and expression weakens the validity of artistic statements. In an ideal civilization, no object is perceived and no action performed without an open-ended vista of analogous, which point to the most abstract guiding principles; and inversely, when pure, genetic shapes are handled, there never berates in human reasoning the experience of particular existence which gives substance to thought.2”

The outcomes of my revised design curriculum include:
• improved student confidence in form-giving
• recruitment of students by the most prestigious firms in the northeast
• high praise from LAAB Accreditation teams
Experiential Learning: A Strategy to Improve the Study Abroad Learning Experience for Landscape Architectural Students

Changshan Huang, Texas A&M University, United States, changshan.huang@gmail.com
Ture Petersenn, Academy for International Education, Germany, petersenn@aib-studyabroad.org
Thomas Knuvener, Texas A&M University, Germany, mail@architekturlandschaft.net
David Baier, Department of Green and Open Space Planning, Germany

Keywords: Experiential learning, action research, design education, study abroad, teaching experiment

Experiential learning is learning through reflection on doing, which actively involves the learner in a concrete experience. Experiential learning is often contrasted with didactic learning, the process of learning without the necessity for direct experience.

In order for students to develop a global vision and cultural sensitivity, many landscape architectural programs in the US offer their students study abroad opportunities. However, while most faculty members understand the importance of international learning experience to the students, some are skeptical and concerned about the learning outcomes of study abroad programs.

Since 2010, an on-going educational experiment has been carried out for three consecutive years with the study abroad program co-sponsored by Texas A&M University and Academy for International Education in Bonn, Germany. The central research question for the experiment is: how to use the experiential learning theory to design and manage a study abroad program with the aim of improving the learning outcomes of the participants? The experiment employs the action research method and uses the experiential learning theory to guide designing, teaching and managing of the study abroad program, and tests the pedagogical strategies for improving learning outcomes of participants of study abroad programs. A total of 67 undergraduate students participated in the program over three semesters. In the end of each semester, program evaluation questionnaires and student course evaluations were conducted and the student work was documented in the form of booklet as evidence of learning outcomes. Based on the faculty’s observations and student feedback, the following year’s program was modified and adjusted. This study provides an exemplary use of the action research method in design education.

The findings of the experiment show that the experiential learning can be a highly effective educational method and the study abroad learning outcomes can be improved through integrating observation, experience, participation, and reflection learning strategies. The experiment also indicates that it is important for a study abroad program 1) to maintain the academic rigor, 2) to achieve the balance between regular classroom activities and cultural activities outside the classroom, 3) to create the rhythm that keeps students’ energy, excitement, and learning enthusiasm at a steady high level, and 4) to make study abroad a fun experience.

The purpose of this panel session is to engage interested landscape architecture educators into dialogue on how to improve the quality of study abroad learning experience. The panelists represent various aspects of the study abroad program.
From Itasca 1.0 to Itasca 3.0: Lessons Learned in Evolving a Field Based Curriculum for Students Entering an MLA Curriculum

David Pitt, University of Minnesota, United States, pittx001@umn.edu
Matthew Tucker, University of Minnesota, United States, mjtucker@umn.edu
John Koepke, University of Minnesota, United States, koepk002@umn.edu
Nichole Schlepp, University of Minnesota, United States, nschlepp@srfconsulting.com

Keywords: Introductory design students, field based and immersive learning experiences

For the past 20 years, incoming students in the MLA curriculum at the University of Minnesota have participated in a one-credit, five-day field course offered in northern Minnesota’s Itasca State Park immediately prior to starting their first semester of graduate education. The course introduces students to the Department’s tri-partite philosophy of integrating ecology, aesthetics, and social values in the creation of landscape space as well as to the analytic/design/drawing skills they will develop in the MLA curriculum. It also begins the development of a studio cohort. This presentation seeks to provide guidance for other MLA programs interested in developing similar immersive experiences that prepare incoming students for pursuit of a professional curriculum.

Early versions of the course (i.e. Itasca 1.0) focused on developing theoretical and applied understandings of landscape ecology. In Itasca 2.0, students integrated these understandings in the creation of landscape space. The current 3.0 expands the spatial and ecological pedagogy by incorporating representational media and skills to “read” landscape legacies and project landscape trajectories as means of developing a temporal understanding of relationships between ecological, social, and aesthetic values in landscape architecture.

Course evolution occurred as a result of not only broadening the curricular focus of the course syllabus, but also altering the method of content delivery. Early 1.0 and 2.0 versions of the course involved didactic content presentation and field exercises led by teaching faculty. Evaluation of learning occurred through more formal methods such as quizzes and critiques of student work. Teaching assistants performed perfunctory “go-for” responsibilities. The 3.0 version now engages students in a more interactive and field-based curriculum in which they evaluate the role of ecological, aesthetic, and social values in the identification and creation of landscape space as well as its evolution over time. Teaching assistants join the faculty as instructors in leading small-group explorations of subject matter. Feedback loops built into group activities enable “on-the-fly” curriculum adjustments as needed. Course instructors subsequently engage participants in first year studios. Overlap between students/instructors and Itasca/studios has proven useful in guiding evolution of the Itasca course and integrating Itasca learning outcomes into studio curricula.

The presentation examines the course’s evolution in terms of instructor evaluation of student performance, the ability of students to perform in first year studios, and the rapport developed among students and between students and faculty. Implications of the evolution of the Itasca program for similar programs at other institutions are examined.
**Igniting Creativity in the Design Studio: Ideas for Action**

**Katya Crawford**, University of New Mexico, United States, katyac@unm.edu  
**Blake Belanger**, Kansas State University, United States, belanger@ksu.edu  
**Phoebe Lickwar**, University of Arkansas, United States, plickwar@uark.edu  
**Carl Smith**, University of Arkansas, United States, cas002@uark.edu

**Keywords**: Creativity, Design Process, Teaching Methods

There are many approaches to fostering creativity in the design studio. The traditional studio structure typically involves precedent studies, site analysis, progress pin-ups, final reviews and grading rubrics. As junior faculty all teaching design studios, the authors question the effectiveness of these inherited methods as the best way to ignite confidence and creativity in students. Our collective experience points to four distinct problem areas: First, a disconnect between site analysis and conceptual design; second, the presence of fear and insecurity embedded in the juried review process; third, the perceived importance of the letter grade in evaluating learning outcomes and work; and finally, the rarity of a collaborative, interdisciplinary, team-driven process reflective of professional practice.

A literature review reveals many perspectives on improving the quality of design studio (particularly in architecture), but there is an overall lack of contemporary resources for developing teaching methods that nurture creativity specific to landscape architecture. As studio is at the core of an education in landscape architecture, it is essential to continually evaluate the effectiveness and appropriateness of our methods. The traditional studio structure has dominated for over half a century in Western education. Is this structure still appropriate? What is the value of juried reviews? Are there alternative methods for giving feedback and evaluating student progress, which build confidence and creativity? What teaching methods can help students shift from analysis to design? How can studio more accurately reflect the collaborative nature of professional practice without compromising conceptual thinking and creativity?

To answer these questions, this panel takes on the typical studio as a design problem. We identify what we perceive to be the salient issues embedded in tradition, and propose alternative methods for igniting the creative process. The authors will discuss immersive studio techniques and alternatives to the letter grade and presentation formats as well as strategies for building student curiosity and confidence using representation and peer reviews as generative idea-building tools. These methods - Ideas for Action - could be applied individually to enhance existing studio structure, or collectively to create a revised model for design studio teaching.

Additionally, through soliciting audience feedback and ideas, the authors hope to generate a robust discussion and interest in contributions to a future book on igniting creativity and instilling confidence in the landscape architecture design studio.
Improving Site Engineering Instruction; Comparison across Multiple Data Sets

Kyle Beidler, Chatham University, United States, kbeidler@chatham.edu
Lauren Panton, Chatham University, United States, lpanton@chatham.edu

Keywords: mastery quizzing, site engineering, pedagogy

An increasing volume of research has demonstrated the benefits of pre-lecture quizzes (Narloch, Garbin, and Turnage 2006; Haigh 2007), online quizzes (Brothen and Wambach 2001; Daniel and Broida 2004; Kibble 2007), and mastery quizzes (Maki and Maki 2001; Johnson and Kiviniemi 2009; Nevid and Mahon 2009). However, there has been limited documentation in which instructors have combined these pedagogical tools as assessment of individual course lectures. This paper presents a blended instructional approach that integrates an online mastery quiz format with traditional face-to-face site engineering lectures.

In the context of this study, a digital mastery quiz is simply defined as web-based quiz that is presented at the beginning of the lecture period and then again at the end. Three years of student quiz scores and exams are evaluated. In each successive year, the quiz format and instructional strategy was revised in an attempt to improve course performance. Digital “drag-and-drop” questions were added to the course content during the latest revision to mimic the recent revision of CLARB’s registration exam. This gradual refinement of the pedagogical strategy allowed us to compare performance results of each course relative to the proposed improvements.

Preliminary findings suggest that online mastery quizzes that are incorporated into traditional classroom instruction are a useful means of evaluating individual course lectures and activities. Furthermore students overwhelming expression of favorable attitudes towards the mastery quizzes in course evaluations, attests to this method. Combined, these facts begin to suggest that a blended online mastery quiz administered at the beginning and end of each class is an advantageous pedagogical strategy. We believe the blended nature of the assessment is critical because it encouraged students to “test their knowledge” as opposed to “learn the material.”
Improving Student Learning through Integrated Project Experiences

Sean Rotar, Purdue University, United States, srotar@purdue.edu
Bernie Dahl, Purdue University, United States, bdahl@purdue.edu
Ann Hildner, Purdue University, United States, achildner@purdue.edu
David Barbarash, Purdue University, United States, dbarbara@purdue.edu

Keywords: pedagogy, methods, integrated projects

Due to their complexity, design projects draw on a broad range of knowledge and skill areas—design theory, sociology, grading and drainage, plant materials, detailing, client interaction, etc.—for completion. However, in most landscape architecture curricula the rigid structure of faculty assignments and course descriptions prevent learning outcomes that allow students to experience the impact of these multiple areas in shaping solutions. Instead, students self-impose limits to creative responses: students operate within “silos” of information without adequately drawing the connections between subject areas that are necessary to achieve a systematic design solution; second, because students attempt to reach a program and set of forms as quickly as possible (to be “done”) they jump to conclusions without fully considering their criteria for making judgments or fully exploring design alternatives. Furthermore, because students don’t consider the ways in which one knowledge area influences the others, and the refinements that result, student design solutions can be one-dimensional.

Juniors at Purdue University are simultaneously enrolled in courses in design, grading and drainage, and plant materials, and are enrolled in the following semester in a course in construction documents. Realizing an opportunity, the faculty of these courses began seeking a single project that would allow the students to integrate material from all of these courses in a single project. Rather than simply using a common site to achieve individual course outcomes, the authors sought a fully integrated experience that would emulate a professional’s process and enrich the end product. This paper describes a project process created by the authors to combat these inherent drawbacks of the traditional curricular structure with these goals: first, to make impact of each knowledge area upon the others readily visible in an integrated project; second, to break the typical structure of student projects in which a master plan is seen as a project’s final product by including an iterative design process, in which many revisions are required; and third, to make visible for students the differences in project results that are achieved through shifting values emphases. The paper will explore the process created and propose opportunities for programs with like curricula structures to implement similar integrated project experiences.
Institutional Archives: Strategic Preservation

M. Elen Deming, University of Illinois, United States, medeming@illinois.edu
Josh Harris, University of Illinois, Urbana-Champaign, United States, jsharrs@illinois.edu
Ilona Matkovszki, University of Illinois, Urbana-Champaign, United States, matkovsz@illinois.edu

Keywords: Landscape architectural archives; special collections; analog media; inventory, collection indexing and assessment

Virtually all CELA members/programs who once taught with analog media and tools in the classroom have now fully embraced digital systems. For most, this transformation began in the early 1990s with text documents, followed quickly by still images and projections, digital design, modeling, websites, digital video and sound files. As a result, most analog educational materials have been rendered antiquated and obsolete. Measured in tonnage, many thousands of cubic feet of institutional storage is occupied by “archival material,” much of it inadequately stored, conditioned, inventoried, evaluated, or even accessible.

Arms of alumni, offices, and emeritus faculty have or might wish to donate their valuable collections of travel slides, VHS video tapes, or archival drawings, but only if institutions have the staff and financial capacity to store and care for these materials (Beck 2011). Despite great emphasis on community access to digital resources, much valuable information about institutional history and pedagogy still exists only in analog media. For instance, the American Society of Landscape Architects (2012) maintains a web inventory of institutional archives held in a variety of institutions and foundations. From Harvard to Berkeley and points between, these archives provide invaluable data for future researchers in our field.

This study reports the practicalities and progress of an on-site inventory and assessment of a small Departmental archive at the University of Illinois, Urbana-Champaign. The project involves expert assistance from a trained archivist and an analog media specialist. Among other things, the collection contains priceless glass slides of inter-war Chinese and Japanese gardens (Florence Bell Robinson), original Exchange Problems (Stanley White) from CELA’s parent organization (NCILA), and student work by professional luminaries (Hideo Sasaki, Stu Dawson, Terry Harkness, et al.) (Kesler 2008). We will report on our methods and strategic priorities for conserving student drawings, accumulated research data, historic lecture videos, personal notebooks, sketches, plastic and glass slides, photographic plates in many formats, as well as the specialized equipment acquired to present and view these artifacts. The study will inform others facing similar challenges in small institutions on practical, low cost, professional ways to stabilize and protect this valuable institutional legacy.
Integrating Disciplines and Teaching Relationships Between Ecology, Experience and Design Through Time and Process

Ken McCown, University of Nevada, United States, kenmccown@gmail.com

Keywords: design, "ecological design", "landscape observatory", "interdisciplinary pedagogy", "architecture and landscape architectural design"

This purpose of this paper is to describe a pedagogy of beginning and ending curricula in architecture and landscape architecture meant to integrate and ground the disciplines by examining the unique qualities of place in time and how the may be incorporated and revealed through design. The importance of this method is that it can bring the disciplines closer to each other in theory and practice, and promote place-based design to augment models of design thinking based around standardized principles such as LEED.

This pedagogy engages students simultaneously in science and phenomenology. Students describe sites through qualitative methods and scientific descriptions that build a foundation of ecological understanding based upon geomorphology, climate, soils and flora and fauna. This foundation, and ensuing qualitative studies to the describe the experience of the scientific data engage the students in disturbance and change in the place.

This teaching method creates a foundation for place-based design and sustainable design that links architecture and landscape architecture. Students explore and design in *time* from an ecological foundation, breaking down how fixed images show an inside (building) or outside (landscape).

Several outcomes measure the performance of the pedagogy. Student feedback, both qualitative and quantitative speak to the capacity for bridging disciplines, in addition to numerical data. Additionally, several projects have won awards out of these time-based studios. This presentation will include a description of the theory, methods, implications and outcomes of an attempt to ground the disciplines by linking the framework for inquiry and development in design to time and ecological processes.
Integration of Participant Input into the Design Process: A Model for Design Education

John Paul Weesner, University of Florida, United States, jp444@ufl.edu
Maria C. “Tina” Gurucharri, University of Florida, United States, guruch@ufl.edu

Keywords: Participant Input, Design Process, Design Education

Design trends in landscape architecture are focusing more on the built environment and examining opportunities for future growth in historic and culturally important places such as downtowns, waterfronts, and neighborhoods. These places are populated with local residents that will be directly affected by the future changes and community participation is an increasingly required action when designing these landscapes. However, there is a gap between the desire of the participants and the resulting design plans (MacCallum 2008; Stephenson 2010). Certain economics and design “habitus” (Bourdieu 1977) have created a static, rational method for producing designs that often impede the desired integration of participant input and mask fundamental problems with communication, politics, and the general practice of design (Cleaver 1999, MacCallum 2008; Conrad, et al. 2011). Much of the research within landscape architecture in participatory action design is focused on the gathering of data and best practices to facilitate input. It is unclear as to how landscape architects integrate this information into the design process and this lack of clarity may be rooted in the way we teach the design process.

The design process can be defined in many different ways, however, within this paper the design process is described as a recursive method which is more of a spiral process where the conclusion of any design stage contributes to the general design knowledge of the previous and future stages (Low 1981; Zeisel 1984; Filor 1994). The designer must have a value system in place when moving through this process, but these values are often inherently personal or justified within the “inherent value of the land” (Filor 1994, 123), but Stephenson (2010) suggests that to better understand the values of the real users (participants) of a designed space, social science methodology and pedagogy must be introduced to the design process. However, there is limited recent research in landscape architecture on this topic, but some endeavors have been made in various service learning-based studios.

This paper explores the integration of participant input into the design process and examines various case studies of participatory action design and academic service learning-based design studios. The research outcomes suggest potential methodologies for bridging the aforementioned gap between data gathering and design generation and conclude with thoughts about new strategies for teaching the integration of participant input as a core foundational principal of a design education.
Inter-dimensional and Multi-scalar Strategies For Teaching Interdisciplinary Design

Kenneth Brooks, Arizona State University, United States, Kenneth.Brooks@asu.edu
Stephanie Fanger, Arizona State University, United States, Stephanie.Fanger@gdc4s.com
Kristian Kelley, Arizona State University, United States, kkelley6@asu.edu

Keywords: collaboration scale transdisciplinary problem-solving

Interdisciplinary design collaboration is frequently listed as a desirable learning objective for landscape architecture, interior design, architecture and other design students. Traditionally, instructional strategies may have approached interdisciplinary problem-solving with a focus on the tradecraft specializations of the participating disciplines as might be found in a multi-disciplinary design practice. Such approaches often result in articulating the boundaries between professions and explicit differentiation between the contributions of design team members based on disciplinary perspectives.

This study evaluates teaching strategies that blur and breakdown disciplinary borders. During the past two years, our design school has created a “bundled” approach to teaching senior design studios. Students in disciplines of architecture, industrial design, interior design, landscape architecture and visual communications design are assigned to design sections within their disciplines and with a studio instructor of their discipline but the sections are placed physically adjacent to each other in a large studio area and assigned to share common design problems and issues. Each section is bundled with one or two other sections of other disciplines and challenged to find ways to advance the learning objectives, not only of their own disciplinary curricula, but also of shared interests in common design problems. Additionally, the school assigned the overarching issue of “energy conservation” as a principle design question to be integrated into the work in each of the studios.

The strategy employed by the authors, each as an instructor of one of the sections, was to engage the students in a series of exercises and assignments that sought integrated design solutions and shared insight in projects developed by interdisciplinary student teams. To facilitate the collaborative processes, exercises and demonstrations on topics of organizational behavior and interpersonal problem-solving energized teamwork. Complex design problems across the subject matter and interests of the participating disciplines were developed to expedite synergetic interdisciplinary solutions.

A principle learning strategy used by the instructors was employing a series of shared dimensions and issues, such as space, scale, proxemics, wayfinding and narrative design as issues that could be collectively and equitably shared by each of the disciplines. Students in one discipline could address a design issue or a design question related to one of these dimensions, and it could be modulated by scale or perspective of the next students of another discipline and together they would advance the integrated solution.
Landscape Architecture 2.0

Benjamin George, Utah State University, United States, benjamin.george@usu.edu

Keywords: Social Media, Pedagogy, Online Education

Social media is the modern expression of social network theory, which places an emphasis on the relationships between actors, and is a way of understanding how nascent ideas take on a life of their own (Freeman, 1979). The emergence of web 2.0 technologies, which promote interaction between users, provides a potential boon for design educators. Social media provides students with the ability to communicate with professionals, the public, and clients in more meaningful dialogue, and helps to make the design process more transparent for clients and stakeholders (Lennertz, 2011; Vanderkaay, 2010). Social media can also be used to enrich collaboration between students by utilizing communication technologies students are fluent in already (Prensky, 2001).

Amongst professionals, social media is currently being leveraged in practice in the fields of planning, architecture, and landscape architecture (Haller & Höffken, 2010). Research shows that while the majority of landscape architecture education programs subscribe to social media providers, real use is quite low (Hewiit, Nassar & Taylor, 2011). This gap between cursory adoption and actual implementation needs to be overcome. Why have social media tools not been integrated more fully? Partially this is due to faculty resistance in adopting new technology (Bender & Good, 2003). While faculty tend to be classified as late-adopters, adoption of social media and social-media embedded mobile devices (such as smart phones and tablets) is approaching universal levels amongst younger generations. Additionally, questions have been raised about how to incorporate social media into current design pedagogy (Kvan, 2001; Bender, 2005). New technologies, such as social media, have the potential to significantly impact a learner’s experience and performance and should not be viewed as an appendage to the pedagogy, but rather as a fundamental part of the pedagogy (Kozma, 1994).

This presentation will explore current social media tools and report on the use of social media platforms such as Corkboard, Ning and Pinterest to facilitate collaboration in an online setting. These tools are used to extend traditional elements of design pedagogy beyond the confines and timeline of the physical design studio, enabling collaboration at anytime from anywhere. Proposals for future integration of social media into the design studio pedagogy will also be presented, including examining the breadth of currently popular social media platforms, and the potential affordances and constraints of each for design pedagogy.
Landscape Architecture from the Active Learning Cloud

Matthew James, South Dakota State University, United States, matthew.james@sdstate.edu

Keywords: Pedagogy, Adult Learning Theory, Active Learning, Cloud Technology

According to Project Tomorrow’s 2008 Speak Up data findings, Generation Y students, those born between 1979 and 1995, are considered to be self-directed learners, un-tethered to traditional education or physical networks, and value experiential learning. Adapting to meet the educational needs of these students provides a distinct challenge for the 21st century campus and landscape architecture faculty. As a means to foster more active, experiential learning activities within the pedagogy of landscape architecture, cloud information technology can be utilized to make content more engaging to these current students. Such cloud technology inclusions can draw on experiential and adult learning theory to create a deeper learning experience for students. The purpose of this presentation is to disseminate strategies used to include active learning cloud technologies in the discipline of landscape architecture.

Active Learning (AL) principles involve interactive, inquiry based, technology-enriched, teaching and learning. Katz (2008) noted the AL Cloud is the networked systems that distribute processing power, applications, and large systems among many devices within a defined geography such as university campuses. The presence of the AL Cloud enables anyone within this geography to connect to the system with diverse devices.

In an effort to move classroom studio teaching to a model that draws from the AL Cloud, specific efforts were made to move studio teaching to a “Supplemental Model,” according to the National Center for Academic Transformation models for course redesign. This model “…retains the basic structure of the traditional course and a) supplements lectures and textbooks with technology-based, out-of-class activities, or b) also changes what goes on in the class by creating an active learning environment within a large lecture hall setting” (NCAT).

This presentation provides a review of specific efforts under the NCAT Supplemental Model that were made to landscape architecture studio courses at South Dakota State University. In this case various applications within the university AL Cloud were utilized. These applications include: Desire2Learn course management system, smart phone applications, tumblr blogging, Facebook, Twitter, Second Life, smart board internet applications, YouTube, Google Earth, Camtasia, Blackboard Collaborate, and Voice Thread. This presentation provides a diverse look at how AL Cloud applications can be integrated into landscape architecture pedagogy. The importance of this presentation is that it reveals means in which landscape architecture educators can embrace Generation Y and adult learning styles and utilize existing cloud platforms to create active learning studio environments.
Landscape Architecture Graduate Education in the Twenty-first Century

Stephanie Rolley, Kansas State University, United States, srolley@k-state.edu

Keywords: masters, graduate, education, landscape architecture, nonbaccalaureate

Master of Landscape Architecture degrees have been awarded by the first of the accelerated programs for five years and two other accelerated graduate programs in landscape architecture developed during the same period. Although nascent, sufficient time has passed to allow a first look at the potential role of these programs and their place in landscape architecture education. Providing students with the opportunity to complete their undergraduate studies in an accelerated manner and move immediately to completion of a master’s degree, these programs present a new model for landscape architecture education.

Landscape architecture graduate programs have lacked common purpose since the rapid growth of programs during the 1970s and 1980s. Growing at an average pace of two per year during that period and one per year since then, masters of landscape architecture programs became a solid foundation of first and post-professional degree education. Although they are commonly recognized as adding depth and breadth to the discipline, there has not been collective agreement regarding their role in landscape architecture professional education. In 1977 John Lyle wrote of “a general lack of understanding of the differences between undergraduate and graduate education and the implications of the latter for the future of the profession” (as cited in Marshall, 1987, p. 9). Debate and discussion about the intent of graduate education continued as the number of master’s programs grew to the current number of 48 (ASLA COE 2008; Hanna, 2001; Miller, 1997; Tai, 2010). The addition of accelerated graduate programs in landscape architecture presented new questions and even greater breadth in the academic range of master’s programs. This presentation situates accelerated master’s programs in the full spectrum of landscape architecture education. Context is provided in an environmental scan framed by university conditions, growth of the profession and accreditation standards as well as an historical review of landscape architecture degrees. A current census of geographic and academic home locations and degrees is provided. This review of the development of accelerated master of landscape architecture programs concludes with a summary of opportunities and challenges faced by the programs.
Leaving the Drafting Table: The Value of Design/Build in Landscape Architecture Education from the Students’ Perspective

Katherine Melcher, University of Georgia, United States, kmelcher@uga.edu

Keywords: design-build, construction, service learning

"I think we are all excited to see what happens when you leave the drafting table." - Lindsay

In fall 2012, nine graduate students in the masters of landscape architecture program at the University of Georgia embarked on a design/build project as an independent study. This new class offering was created as a result of student organizing efforts.

There were three main goals for the class.
1. Giving students an opportunity to gain hands-on experience with landscape construction techniques and materials.
2. Creating a situation where students can see the connections between their own designs and the final built product.
3. Connecting the class with the service-learning mission of the College and the University.

The site was a central open area surrounded by seven homes in east Athens being constructed by Habitat for Humanity. The houses have very little open space of their own, so the central area needed to be attractive and useful for the seven households. The Athens Garden Club had already adopted the project and raised funds for its installation; they just needed a design and some muscle. The Athens Area Habitat for Humanity and the Athens Garden Club served as our clients and partners for the project.

Throughout the project, students were required to keep a blog. This poster uses those blog posts to present the design/build project through the students’ words.

Interest in incorporating design/build projects into landscape architecture education appears to be growing. Through design/build, educators find that students learn more about the connections between construction and design as well as gaining confidence and improving teamwork skills. Hearing how those little and big discoveries happen directly from students creates a compelling argument for how valuable and rewarding design/build education can be.

"Most of us took this class for the opportunity to get our hands dirty and see what it takes to implement our grand design ideas. Not surprisingly, we received many lessons on this throughout the class, showing us where our best-laid plans might have needed a bit more attention. While it was humbling at times to realize how much we had to learn, it was also exciting to get such a great jump start on that education." – David
Lessons from Interdisciplinary Foundational Studies in the School of Architecture + Design at Virginia Tech

Mintai Kim, Virginia Tech, United States, mintkim@vt.edu
Brian Katen, Virginia Tech, United States, bkaten@vt.edu

Keywords: interdisciplinary, foundation, design, environment, representation

This paper examines an interdisciplinary foundational studies model developed in the School of Architecture + Design at Virginia Tech. The model is comprised of three foundation courses. The first course is the School-wide interdisciplinary Foundation Design Lab, conceived as "an immersive, interactive learning environment of inquiry, experimentation, discovery, and synthesis for students studying architecture, landscape architecture, interior design, and industrial design." A typical Lab has from twenty to twenty-four students, including two to four Landscape Architecture students. Each lab’s design explorations are non-disciplinary in focus and are engaged equally by students in each of the disciplines.

The two additional courses, conceived to provide first-year landscape architecture students with a necessary disciplinary grounding to further inform work undertaken in the Design Labs, complete the model. The first disciplinary course, Environment and Natural Systems, taught in the fall semester of the student’s freshman year introduces students to the physical environment and its natural systems, with emphasis on their integral relationship to planning and design. Topics studied and discussed include the landscape’s natural elements and systems, its ecologies, structures, and patterns as well as an introduction to current questions and imperatives regarding sustainability.

In the spring semester of the freshman year, the student’s introduction to the complexities of the physical environment continues in Seeing, Understanding and Representing Landscape. In this course, students explore a critical component of the contemporary practice of landscape architecture: the skill to clearly, accurately, and creatively see, understand, and represent the landscape – as a material, temporal, and culturally expressive medium. Through examples from contemporary practice and applied field studies, students examine a wide range of analog and digital representational strategies, media, and methods including drawing, watercolor, collage, models, photography, and video for understanding, evoking, revealing, and expressing the multiple dimensions and experiences of the landscape. Representation is discovered to be both an act of inquiry and as a vital means of communication within the practice of the discipline.

This paper examines the work produced in each course in the model and utilizing feedback from current and past students through interviews and surveys and discusses the benefits and challenges of the model for landscape architecture students.
Lessons in Praxis from Chaumont Sur Loire

Katya Crawford, University of New Mexico, United States, katyac@unm.edu
Susan Frye, University of New Mexico, United States, sfrye@unm.edu

Keywords: Design Build, Praxis, Studio Pedagogy

This paper examines the design build process as a valuable lesson in praxis. Last fall the authors submitted a winning design proposal to the Chaumont Sur Loire International Garden Festival in France. In March of 2012 the authors flew to France with three others to build the project, which had to be constructed in ten days for eleven thousand euro. The experience gave us the opportunity to practice what we preach in the classroom from conceptual design through implementation. The paper focuses on the creative design process, modes of visual and written representation, collaboration and learning through building.

As teachers we continually test our pedagogic objectives through developing innovative assignments and refining teaching methods to ensure positive learning outcomes. This competition allowed us to test the same methods we use in studio through first-hand engagement. Our role as teachers flipped to subject as we navigated the design process that we endorse in studio. While winning the competition was validating, the process itself was the most enlightening.

The assignments that we propose in studio stay in the realm of representation. In other words, we explore the design process through analysis, drawing, conceptual collage, model building and to a lesser degree, writing. For the most part we are comfortable with this reality, as landscape architects don’t generally build the projects they design—they represent them. But what teaching and learning opportunities are we missing when our designs live and die in the realm of representation? The authors posit that the act of building creates a critical first hand knowledge of material properties, requires successful collaboration, can build communication skills, is a critical reflective process for design and is one of the most effective means of obtaining praxis—the fusion of theory and practice.

Prompted by our experience, we are in the process of organizing a summer design/build studio. Like the gardens at Chaumont Sur-Loire, the projects will be ephemeral in nature, will be guided by the current innovative discourse in the profession and give the students the opportunity to realize their designs in the built world. Through sharing our methods and experience of designing and building at Chaumont Sur Loire, we hope to generate a robust dialog about the opportunities and benefits inherent in learning through building.
Making Our Graduates Competitive in the Workforce: What Soft Skills do Students, Faculty, Alum and Employers Value?

Pat Crawford, Michigan State University, United States, crawf203@msu.edu
Robert Dalton, Michigan State University, United States, daltonr1@msu.edu

Keywords: soft skills, employability

Facing the realities of increased education costs, competitive job markets and new demands of the 21st century, Universities are exploring how they can revitalize education and make their graduates more competitive in the workforce. Today’s employers are looking for skills beyond discipline, knowledge and technical acumen. But what are those extra skills? The purpose of this study is to compare and contrast the value of soft skills from the perspective of students, faculty, alum and employers working in built environment fields.

The study explores the ranking (using a force-rank response system) of soft skills (7 clusters with 7 characteristics each), such as communication, listening effectively, cross-disciplinary experiences, working well under pressure, ability to self-start and leadership. The soft skill priorities are compared to identify where students, faculty, alum and employers in Landscape Architecture and allied professions (n=1,036) agree or differ. The data is a subset of a larger study with over 8,000 respondents in Agriculture and Natural Resource disciplines from all 50 states and 30 Universities. Mean scores are used to identify rankings of soft skills and ordinal regression to identify significant differences between the stakeholder groups.

The employers rank order of soft skill priorities is: Communication, Self-management, Teamwork, Decision-making/Problem solving, Experiences, Professionalism, and Leadership. All of the stakeholder groups agree Communication is the most important soft skill. However, within this cluster faculty significantly rank writing skills higher than the other groups. The presentation will highlight other differences, such as employers rank self-management skills second, while students rank it fourth. On the flip-side, student rank experiences (eg: internships, study abroad) much higher than employers.

In presentations of the larger data set, the findings have sparked heated debate as to what we should emphasize in our courses, who’s responsible and the role of study abroad in preparing students for employment. The discussions and findings can inform educational curriculum to enhance the soft skills which will make our students more competitive. While there is much in common, and ALL of the soft skills are important, the priority rankings can aide in where to focus limited time and resources. As faculty, do we need to be more critical with our students’ oral presentation skills? How do we help them understand the importance of self-management? The final solution will be a combined education, employer and individual effort.
Models for Integration of Design-Build into Landscape Architecture Curricula

Ole Sleipness, Washington State University, United States, ole_sleipness@wsu.edu
Phil Waite, Utah State University, United States, ps.waite@usu.edu

Keywords: Experiential Learning, Design-Build, Construction, Implementation

1. Purpose
This study describes how design-build experiences can be incorporated into landscape architecture curricula to augment design studios and traditional technical courses, identifies challenges inherent in experiential learning applications, and recommends strategies for successfully implementing and sustaining design-build programs.

2. Background
Many students find courses in construction, technology, and implementation to be among the most challenging subjects in landscape architecture curricula, particularly when they lack construction experience as a contextual basis for technical courses. Design programs have responded by initiating design-build experiences through various models including discrete implementation projects, as well as entire courses devoted to these experiential learning activities. This project contrasts the implementation of design-built programs at two institutions, documents and evaluates their challenges, and recommends strategies for successful incorporation of design-build experiences within design programs.

3. Methods
Using a comparative case study method, two design-build programs were evaluated for their effectiveness, constraints, and opportunities within their physical, social, academic, and fiscal contexts. Data sources include student surveys, focused interviews, and evaluation of built works.

4. Findings
The study discusses the successes, challenges, and opportunities of design-build programs relative to physical context, student culture, curriculum structure, and support of faculty, administrators, and stakeholders.

5. Importance
As design programs seek to incorporate design-build as a delivery method for construction/implementation, careful consideration for physical context, student culture, curriculum structure, and cultivation of broad-based support can enhance the effectiveness of this experiential learning model.

6. Learning Outcomes
Attendees will learn strategies for successful implementation of design-build experiences within the context of university design education programs.
Open Forum for the Committee on Strategic Planning and Faculty Support

Sadik Artunc, Mississippi State University, United States, sa305@msstate.edu
Kenneth Brooks, Arizona State University, United States, Kenneth.Brooks@asu.edu
Margaret Bryant, State University of New York (Syracuse), United States, mbryant@esf.edu
Forster Ndubisi, Texas A & M University, United States, fndubisi@arch.tamu.edu
Bernie Dahl, Purdue University, United States, bdahl@purdue.edu
Sean Michael, Utah State University, United States, Sean.michael@usu.edu
Richard Hawks, State University of New York (Syracuse), United States, rshawks@esf.edu
Mark Boyer, University of Arkansas, United States, mboyer@uark.edu

Keywords: Faculty mentoring, coaching, training; career support and advancement

The CELA has recently established a committee entitled “Strategic Planning and Faculty Support.” The charge of this committee include but not limited to assisting CELA in faculty support, to serving as a resource for members to become better educators, and helping advance careers through the following strategies and tactics:

- Mentoring, coaching and training.
- Providing support in the scholarship of teaching and learning (STOL).
- Career support and advancement (pre- and post-tenure).

This session is designed as an open forum to generate ideas, needs, wishes and desires from both pre-tenure and tenured CELA members toward development of an action plan with measurable objectives. The panelists will initiate discussion threads and invite participation. The initial ideas include but are not limited to the following:

- Explore avenues of establishing formal mentoring relationships that live beyond the CELA meetings (that are able to generate informal advising/listening sessions, only).
- Explore avenues of using web-based methods of interaction (webinars, listservs, Facebook or Google+ groups) as well as conference calls, through which the cohort group may explore and share their experiences similar to ASLA’s PPNs. If CELA had such groups, tied to scholarly interests, it might be a way to support both pre- and post-tenure faculty. A group/cohort might also address junior faculty needs regardless of scholarly interests.
- Offering pre-conference workshops and/or training for various topics such as:
  - Publishing and advancing the body of knowledge and experience.
  - Grantsmanship: Seeking Funding for Teaching, Research and Outreach
  - Achieving Tenure and Enjoying the Life o Post-tenure Advancement
  - Gaining National and International Recognition and Visibility
  - Leadership Development
  - Transition from being a mentee to being a mentor
  - Giving Successful Presentations Toward Effective Dissemination of Scholarship

The Strategic Planning and Faculty Support Committee would like to recruit additional members (especially pre-tenure) to the committee to have a more representative membership, which will help us establish a broader perspective.

In conclusion this session is intended to be an exploratory open forum to brainstorm and hear from the membership before the Committee makes a formal offering.
Practicing Professionally

Nicholas Nelson, Oklahoma State University, United States, nicholas.nelson@okstate.edu

Keywords: experiential learning, informal learning, studio, community

Design studios and professional practice are courses common to landscape architecture programs. These courses are often theoretical and primarily academic in nature. The purpose of this exercise was to simulate a professional workplace to create a dynamic learning environment for students of the senior capstone design studio. This was done to reinforce student’s experiential knowledge obtained during internships and apply it cumulatively with their academic knowledge. Students were theoretically salaried at $39,000 giving them the potential to earn up to $5,250 over the seven week period of the project.

A real project with a tangible site, program, and vested stakeholders was secured with an operating budget of $4,000 to cover travel expenses and document production for the project. The studio classroom itself was cleaned and purged of distraction, desks rearranged, and a conference table space created. Pictures of professional projects decorated the walls. The studio itself was branded “studio 6” and a sign was hung on the door.

Students earned “salary” to receive their grades. A pay scale was established and weekly paychecks were distributed based on participation, punctuality, and contribution. This was based on their mandatory weekly time log reports, as they recorded what they were doing and for how long they were doing it. If students were late or missed class they were docked pay.

Weekly planning meetings took place every Monday. Students assumed decision making roles and reported what they accomplished the previous week to each other. During this time coordination and collaboration with each other further developed their own areas of study and the overall project. Over the course of three months students facilitated a two day community inventory trip, a town hall style public meeting, one stakeholders meeting, and a public open house to present the 120 page professional quality document to the community.

Utilizing experiential learning enabled the students to engage a live community project through research, analysis, and design. Unexpectedly, this exercise illustrated the value of informal learning. Informal learning occurs in places where families and social groups interact. In these places knowledge is often built via collaboration, and people act as learners and teachers alike (Bell et al. 2009). In this case, the informal learning facilitated by the experiential learning. Based on student feedback, the informal learning had the most profound impacts on what they learned. Specifically, the positive impact design can have on the communities in which we live.
Propagating Interest in Plant Design

David Hill, Auburn University, United States, hill@auburn.edu

Keywords: Plant Design, Planted Form, Plant Spatiality, Plant Ephemerality, Plant Functionality

Within the discipline of landscape architecture, we generally share the opinion that plants contribute more to the landscape than the mere “foundation planting” around the base of a building; beyond a simple “softening” of architecture. Plants are structural, spatial, active, dynamic, revelatory, functional, performative. As such, landscape architects need to aggressively and carefully understand plants. Several curriculum models and techniques attempt to engage students entering the field of landscape architecture in design through the realm of plants. Each model bears its own particular strengths and weaknesses.

One approach, which is currently being tested within Auburn University’s graduate program of landscape architecture, employs concise design exercises to introduce students to the evocative characteristics of plants. Rather than focusing exclusively on identification and memorization, Auburn’s trilogy of courses [plant spatiality, plant ephemerality, and plant functionality] investigates three primary attributes of plants and experiments with the potential design implications embedded in each. Plant spatiality examines the power of plants to create and manipulate space within the landscape. Plant ephemerality carefully observes how plants change over time and attempts to employ this flux within design strategies. Plant functionality quantifies a number of functional and performative roles that plants play within the landscape and seeks to amplify those operations through design intervention. These three attributes are clearly not an exhaustive compilation of plant characteristics, but simply serve as an initial launching point for designers to further their conceptualization of and engagement with the realm of plants.

This paper will briefly discuss several prevalent pedagogical strategies in plant design education, present the approach being tested at Auburn University, discuss student work emerging from the courses, and reflect on the status of the ongoing plant-motivated investigation.
Quick Response Design Assessment

Simon Bussiere, Ball State University, United States, bussiere@post.harvard.edu
Lohren Deeg, Ball State University, United States, ldeeg@bsu.edu

Keywords: QR codes, assessment, critique, pedagogy, design review

As the rapid deployment of QR (quick response) technology in print and digital media is impacting the cultural landscape there appears to be many useful applications within the context of academic assessment in design education. There has been brisk growth in smart-phone ownership, digital literacy and in the interface between digital and physical media content through mobile devices. The subsequent transformative impact of this emerging phenomenon produces a very real potential to capitalize on the technology, bringing it along side other ongoing efforts with the aim of improving assessment methods and student learning outcomes in design studios. QR codes are a two-dimensional matrix data storage technology that is becoming popular due in large part to their fast readability and large storage capacity when compared to standard barcodes. They are already synonymous with advertising and marketing media.

The process being presented in this study begins with the development of an online survey that contains questions based on the grading criteria for the project under review. Next, specific QR codes are generated through third-party online software using the URL for the assessment survey. The codes are then printed and embedded in final boards and models under review. Critics scan the project’s QR code (with their smartphone or other mobile device) linking their device to the survey. Critics then enter their anonymous evaluation for the project directly into the online survey where the results are aggregated and immediately projected in the review gallery. The inherent anonymity of the survey fosters a review environment where more honest critiques can happen. The definition of critic is elastic, and largely dependent on the placement of the work.

Using QR codes in assessment enables the immediate and robust capture of comments and critique, with minimal loss, into a digital data set to be used in reframing and improving the project delivery in subsequent phases of the project or in following years. Due to the direct feedback afforded by this technology, there is a dramatic increase in the speed with which students are presented with an honest summative assessment of their work, potentially increasing the immediacy, urgency and awareness of their design success or failure as it relates to the project criteria. Additionally, students can be provided with a take-away print of the survey results for their own records rather than relying on hand written notes.
Say It Isn’t So: Clarifying the Role of Plant Knowledge and Usage in Landscape Architecture Education

Judy Byrd Brittenum, University of Arkansas, United States, jbritten@uark.edu

Keywords: landscape architecture education; planting design; plant identification; curriculum

Word on the street is that plant identification and planting design are obsolete as required courses in United States landscape architecture curricula. One primary indication that appears to lead to the story’s substantiation is that the national Landscape Architecture Registration Examination (LARE) has no section dedicated strictly to horticultural expertise. A nagging question remains: has the profession turned a blind eye to the issues of health, safety and welfare inherent in the best use of plants in design? In order to determine if such a rumor has merit, a questionnaire, analyses of previous studies and professional practice organizations was conducted.

To determine if historically required plant identification and planting design courses were still found in accredited schools, a questionnaire was submitted to department chairs of both undergraduate and graduate curricula in the United States. Responses were returned from 35 of 65 accredited schools. This paper contains findings and develops comparisons, including peripheral information gathered in the open-ended comment sections.

Additional analyses are used for contrast between known standards in landscape architecture, namely the Landscape Architecture Body of Knowledge study (2006) and LARE’s study material for LARE applicants. Information about states that require extra plant material/usage sections is included as is commentary from the new ASLA Professional Practice Network group, called Planting Design, which was recently formed by practitioners who wish to re-emphasize horticulture importance. Descriptive findings from the pilot study reached initial conclusions about the current state of plant components in landscape architecture education, some of which are: undergraduate requirements mostly function under the old model standards while graduate requirements do not; construction and legal issues in planting design are not clearly addressed; ecosystem and native planting are emphasized in graduate education, and plant usage is important in other mandatory courses. These findings reveal that plants are still an important part of holistic study today, although they are not always presented in traditional ways.

This paper provides a point of departure for those considering the place plants take in today’s landscape architecture curriculum. It also offers a possible vision of the role of plant education in the discipline’s future.
Socratic Questioning: The Art of Questioning in Thinking, Teaching and Learning

Sarah Thomas Karle, University of Nebraska-Lincoln, United States, sthomas10@unl.edu

Keywords: Socratic Method, Critical Thinking, History, Active Learning

This article describes the use of the Socratic Learning Method (SLM) as a constructivist learning approach to improving students’ critical thinking skills in a landscape architecture history and theory course. The Socratic Learning Method consists of four key steps: eliciting relevant preconceptions, clarifying preconceptions, testing one’s own hypotheses or encountered propositions, and deciding whether to accept the hypotheses or proposition (Lam, 2011). Students are required to examine assigned readings and complete weekly writing exercises designed to cultivate each of the four steps listed above. A key component of the weekly assignment requires students to prepare Socratic questions: close-ended, open-ended, global pattern, or societal comparison questions for class discussions. Such questions allow students to think critically, analyze multiple meanings, and express ideas with clarity and confidence during class discussions. The paper will present assessment of the weekly writing assignments and in-class discussions by tracking students’ growth in key critical thinking concepts such as: analyzing thought, assessing thought, analyzing questions by systems, developing prior questions, and identifying domains within complex questions over the semester (Paul, 2006). While the Socratic Learning Method functions as a teaching method when instructors introduce it to students in the classroom, this paper emphasizes its use as an approach to learning that individuals cultivate, with practice into a vigorous thinking habit.
Teaching Residential Design in the Age of Sustainability: Twenty-First Century Anachronism or Neglected Fundamental of Professional Pedagogy?

Dean Cardasis, Rutgers, the State University of New Jersey, United States, cardasis@sebs.rutgers.edu
Elizabeth Thompson, University of Massachusetts, United States, thompson@larp.umass.edu

Keywords: residential design, pedagogy, education

Residential design, once the mainstay of professional landscape architecture education, has been dropped by many landscape architecture programs in the past several decades. Today, among the 95 accredited undergraduate and graduate programs, only 6 even offer it as a discrete identifiable part of their curricula. While this statistic may overstate the case, since some aspects of residential design may be covered in other courses (notably planting design), clearly residential design, as a fundamental element of landscape architecture education has become almost extinct. While historically there have been many reasons for this, including our need to distance ourselves from nurserymen and landscapers; as well as our need to embrace other, larger and more apparently complex aspects of the profession, such as urban and regional design, it remains a paradox since residential design constitutes the single largest sector of landscape architecture professional practice today and since it provides an intimate, personal and direct opportunity to engage design issues characteristic of large, complex contemporary problems, as well.

The purpose of this study was to identify the character of student work being executed in the genre of residential landscape design today. In a 2012 national residential design competition for both students and professionals which sought to explore aesthetic and ecological aspects of contemporary residential design (Suburbia Transformed 2.0), 55 student designs were submitted by students from 17 different landscape architecture programs in the United States. These student submissions were examined and discussed by a jury of distinguished educators and professionals (Urbanski, Bargmann, Oberlander, Volpe and Calkins); as well as analyzed by the competition organizers (Cardasis and Thompson). Only two projects of the 55 were recognized for their merit.

In general, the findings of the jury and competition organizers included students’ failure to grasp design fundamentals, their inability to understand and respond to specific site conditions, their preoccupation with communications technology and their inability to grasp and meaningfully manipulate space. These and other findings suggest areas of weakness in our design curricula and point to ways we can better serve our students’ professional needs and general design educations by engaging the contemporary nature of residential design education in this age of sustainability, as previous educators have in modern, post-war and country place eras before us. It is hoped this competition and study will initiate a discussion among educators and professionals about the nature and importance of residential design in contemporary design pedagogy.
Teaching the First Year MLA Studio: Developing a Core Studio in the Education and Inspiration of Future Visionaries and Design Professionals

Joni M Palmer, Independent Scholar, United States, joni.palmer@colorado.edu

Keywords: curriculum, design education, first year studio, MLA I, pedagogy, teaching

Teaching the first year MLA I studio is a complicated, demanding, profoundly rewarding, and consequential core course in the MLA curriculum. There is a dearth of scholarly literature about the first studio in the MLA I curriculum; therefore, this paper addresses this gap. Additionally, it addresses the conference theme of “Space Time Place Duration” as it discusses these concepts in relation to the education of a landscape architect.

The aim of the paper is to highlight the special task of teaching the first year studio. The studio I will be discussing, as a case study, is titled “The Anatomy of the Garden.” This title reflects an emphasis on the body, space, place and time. In this paper I will discuss the curricular framing, the pedagogical underpinnings, the course material and sequencing, and the studio results. As a starting point for discussion, this studio’s three learning objectives were taught through a series of exercises that prompted students to work through various scales (from the body to the region), to physically and intellectually engage spaces and places, while bearing in mind a range of temporalities:

1. To develop a landscape/architecture vocabulary A landscape/architecture vocabulary is learned and enacted verbally, textually, orally, and materially. As such, students engage in a series of projects that exercise and test their knowledge of the language of the discipline.

2. To develop the conventions of landscape architectural design thinking The discipline is at the intersection of the physical world of time and matter and the virtual world of ideas and concepts; therefore, by the end of studio students will have an ability to translate ideas into drawings and imagine the next translation into constructed and inhabitable landscapes.

3. To address the implications of design practice, and the grounding of particular ideas for inhabiting the earth Built landscapes have consequences; thus, the final objective is to understand what it means to project our ideas of landscape onto the ground and into the world. The following questions will be considered: What is landscape? What is landscape architecture? What is the relevance of landscape architecture?

There is an overarching agenda of this paper: to generate a larger and more rigorous conversation about the many different approaches to teaching this foundational studio. I hope this paper spawns a discussion about categories of approaches, assorted challenges, and specific issues departments are facing.
The Analytical Eye: Awakening Design Students to the Potential of Photographic Inquiry

Phoebe Lickwar, University of Arkansas, United States, plickwar@uark.edu

Keywords: photography, site analysis, design pedagogy

Photography is a ubiquitous tool within both professional practice and design education. However, the medium is rarely taught as a method to critically analyze the built environment. More often it is used to record information in an encyclopedic fashion without consideration or craft; practiced in this manner, photography provides the means to glimpse once and quickly forget. However, the camera has been used historically as a way to discover, analyze, and define one’s relationship to the physical world, from the earliest 19th century studies rooted in scientific inquiry to contemporary investigations of space and time (Spiri, 2011). The focused observation and analysis in which photographers engage requires full participation of the senses, as well as a constant evaluation of embodied spatial relationships. Though the photograph itself may be considered a largely visual artifact, the process of photography is a complex physical, sensory experience, offering designers the opportunity to come to a richer understanding of the experiential, spatial, and temporal qualities of sites.

Recognizing the typically unrealized potential of the medium for those in the design disciplines, the author created a new elective course that introduced students to an intentional practice of photography as a way to investigate the landscape. Students spent the semester photographing a site of their choosing, using the camera to analyze ephemeral conditions, discover formal relationships, and challenge existing narratives. Each student maintained a blog including photographs and writing to chart their growing understanding of photography as an act of interpretation, a process of uncovering something hidden.

This paper examines the ways in which photographic inquiry enables site discovery, addressing the gap in the literature on photography as an analytical tool for designers of the built environment, specifically the process of thinking through photography as opposed to thinking about the photograph. What aspects of the landscape are best understood through photographic inquiry? How does the use of the camera impact one’s understanding of and relationship to the site? These questions are explored first through a presentation of the ways the medium has historically been used as a tool for research and secondly through an analysis of the observational and analytical skills gained by design students engaged in the elective course. A comparison of students’ site analysis work performed at the beginning and end of the semester shows that instruction in photographic practice provides an avenue for accessing the site in a powerful way.
The Integration of Educational Theory and Cognitive Processes into Learning Landscape Design

Matthew Powers, Clemson University, United States, powers8@clemson.edu

Keywords: Learning Landscape, Education, Play, Schools

Outdoor classrooms, subject specific gardens (i.e., science gardens), children’s gardens, and other similar landscape interventions have become popular additions to school campuses, museum grounds, parks, and other public spaces over the past 10 years. These landscapes are often referred to as “learning landscapes.” A Learning Landscape is a landscape designed to enable teaching and/or facilitate learning through interaction with the natural and cultural landscape. Learning landscapes provide attractive outdoor learning spaces that often improve the environment while facilitating experiential learning. However, the performance of a learning landscape varies widely based upon many critical educational and environmental metrics. Furthermore, very few studies have examined the efficacy of learning landscapes, particularly the ability of these landscapes to facilitate teaching and learning. Therefore, the central research questions of this study include: How do learning landscapes facilitate learning? And, how can environmental designers create learning landscapes that enhance teaching and improve learning? The goal of the study is to develop an analytic framework for examining learning landscapes with an emphasis on pedagogic indicators. The framework is derived from existing theories and concepts in the fields of educational and cognitive psychology, environmental education, play, landscape design, and related bodies of knowledge (Bruner 1962; Kolb 1984; Lave and Wenger 1990; Savery and Duffy 1995; Novak et. al. 2011). Additionally, a series of case studies inform the new framework while further conceptualizing learning landscapes and helping answer the research questions. The case studies focus on learning landscapes built on elementary and middle school campuses in South Carolina. Each case study includes observation, mapping, and documentation of the learning landscape and interviews with teachers about the use and efficacy of the landscape. Student test scores for each school and the relevant subject area competencies are also compared with teacher responses to explore possible relationships. The results of the study will appeal to environmental designers interested in creating learning landscapes, specifically on school campuses, as well as those wanting to learn more about applying education and psychology theory to landscape design.
The Learning Experiences of Chinese Students in LA departments in USA

Bo Zhang, Ball State University, United States, bzhang@bsu.edu
Xiaolong Zhao, Harbin Institute of Technology, China, zxl20050409@yahoo.com.cn
Dan Chen, University of Florida, United States, chendan222@ufl.edu

Keywords: international education, landscape architecture education, Chinese international students, curriculum, transitioning challenges

Recent five years witness a tremendous increase of Chinese students’ presence in landscape architecture programs in the United States. In some departments, Chinese students numerically constitute the majority of the MLA program. Many LA departments feel the particular needs of exploring the uniqueness of Chinese students to achieve better pedagogical outcomes. While intercultural communication theory and international education inform general principles that may be applicable, specific researches addressing design education (and more specifically, Chinese students as a critical component in MLA programs in US) has hardly been seen. This study addresses this intercultural education phenomenon by seeking attitudes from Chinese students. About twenty students (graduates or ABT) from three universities will be involved in focus groups, invoking their feedbacks in 1) curriculum structure, 2) specific courses, and 3) self evaluated learning outcomes. A questionnaire of 30 questions will be developed from these focus groups. The online questionnaire using the Survey Monkey will invite 100 students (graduates or ABT) to participate and expect to receive 70 valid responses. The results will inform educators in landscape architecture as well as intercultural education researchers of better understand design education under intercultural settings.
The Site Documentation Method as an Effective Approach for Teaching Introductory Studios

Anne Godfrey, University of Oregon, United States, godfreya@uoregon.edu

Keywords: Pedagogy, Introductory studio, skill acquisition, design development, fundamental drawing skills

New students in Landscape Architecture require a strong foundation of fundamental skills in order to experience success in design work. Often introductory studios ask students to simultaneously design while acquiring core skills in observational drawing, conventional drawing (plan, section, perspective, diagramming, etc), spatial composition, conceptual thinking, site analysis and design critique. Asking students to design while they are learning core skills puts the cart (design) before the horse (core skills). The author observed, in teaching 14 introductory studios, that students become frustrated and overwhelmed in the traditional pedagogical model.

The author developed the Site Documentation Method as a new structure for introductory studios. The Site Documentation Method (instead of design) is the primary learning tool in the introductory studio. Students learn conventional drawing types, freehand drawing skills, conceptual thinking, analysis of built spaces (both spatial and cultural), and spatial ordering for human scale through the Site Documentation Method.

The Site Documentation Method is based on the creation of a hand drawn “poster” or “board” that documents an existing work of Landscape Architecture. Students make three or four Site Documentations during the intro studio. I chose examples that students can easily visit and observe. Students learn section, plan and perspective through physically measuring these places. For each Site Documentation, students make measured and observational drawings, diagrams and create a concept statement. They also locate existing design documents to assist them with the process. Later students add discussion and critique of contextual and cultural issues that influence how the site was designed and how people use it. Each iteration builds on previously acquired skills while adding a new set of skills, thus the students actively understand they are building a foundation of skills.

The paper and presentation will outline the step-by-step process of the Site Documentation Method and how students’ skills accumulate and become more sophisticated through successive Site Documentations. The paper and lecture will display specific examples of student work at each stage in the process.

With this approach, I’ve watched students learn and thrive and their attitudes change from frustration to enthusiasm. It is clear to them that they have worked hard at developing a strong foundation from which they can draw upon. Also, the amount of time devoted to skill building in drawing and design analysis gives students a greater level of facility much sooner in their design education. This engenders confidence in their future design decision-making processes.
The Unconscious Landscape and the New Science of Life

Cheryl Mihalko, Oklahoma State University, United States, cheryl.mihalko@okstate.edu

Keywords: landscape performance, Carl Jung, Joseph Campbell, Rupert Sheldrake, morphic resonance, 1st Global's, Paul Kephart,

The trend to quantify landscape solutions defensible is a response to current economic pressure and the need of policy makers. While measuring landscape performance is valued, the degree to which performance proof and objective data is sought risks teaching and learning about design that resonates with secular spiritualism as a component of the natural world.

This paper posits that innovative design can shape the built environment and that quantifiable objective statistics that preserve, protect, sustain, renovate, and replace resources are not mutually exclusive to exploring instinct, passion, and the cultural vision of myth the world over. It includes presenting Carl Jung’s collective unconscious. Jung demonstrated that Western culture was bound in science and logic at the expense of spiritualism and insight shown throughout history in other cultures. An idea illuminated by the life work of Joseph Campbell.

Introducing students to themes that run through myths and holistic integrative archetypes exploring instinct and the universal character of the collective unconscious, combined with an objective view of morphic resonance offered by new science of life biologist Rupert Sheldrake, open new possibilities for landscape design that undergraduate students are able to synthesize into form.

The philosophical and spiritual renewal in a connection with nature is valued by twenty-something’s First Global undergraduates who possess secular spiritualism, search for inner tranquility, and tend to look for deep meaning from life. (Zogby 2011). They prefer experience--rather than stuff. They understand a linked fate, have a heightened social awareness, a genuine appreciation for diversity and multiculturalism, and a more personal spiritual sense of the world in general. (Zogby 2011)

The paper posits that outside of the traditional landscape architecture survey history course, and prior or concurrent with an initial design studio, undergraduates should be introduced to current ideas of nature and theory through a course that surveys precedents that explores complex collaborative work of the last forty years.

An example is the work of Paul Kephart a restoration ecologist. His roof gardens defines a vernacular biodiversity performance design style that does not isolate quantifiable components as amenities or feature but integrates bio-swales, grey water, and passive solar, into design that makes it a part of a whole that responds to the deeper ideas of nature discussed by new science biologists.
Theory Theatre: Reflections on an Experiment in Border Pedagogies

Karen Wilson Baptist, University of Manitoba, Canada, karen.wilsonbaptist@ad.umanitoba.ca

Keywords: Theory, border pedagogy, performance theory

“With cities, it is as with dreams: everything imaginable can be dreamed...” (Calvino, 1972, p. 44)

Alexander (2005) describes border pedagogy as a transformative practice that aspires to “engage students in the places and ideological spaces of their own experiences as they try to make sense of culture and curriculum” (p.427). Grounded in theories of performance (Thrift and Dewsbury 2000), border pedagogies situate knowledge acquisition within an embodied, temporal, dialogical, and spatial experience for the learner. As a critical discourse, border pedagogies challenge hegemonic divisions within design schools, “refiguring the boundaries” (Giroux, 1991b) between educator and student, thinking and making, and theory and spatiality. It is a truisim to say that theory strongly influences design thinking. This logically infers that theory is integral to design practice. As educators we believe this to be so. Yet one of the many schisms in schools of design is the division between “thinking” and “making”. This notion influences our pedagogical methods and the tools we provide our students with so that they may become competent designers. But critical educators also envision our students as critical designers, who could challenge prevailing norms and radicalize taken-for-granted practices. The study of theory reveals the world as a deeper realm; students learn that culture is not something passively consumed, it is constructed, produced, and if not challenged, may extenuate systems that prolong, intensify, and replicate oppressive practices. This is no less true for design, than for any other discipline (Dutton, 1991).

As an experiment in border pedagogy, theory theatre provides students with an opportunity to remap the critical dimensions of theory through a performance-based pedagogy. Working in groups of four, students construct a conversation between a theorist and a designer. The dialogue is theatrically staged within a series of imagined environments each discursively constructed through interpretations of theory. Theory theatre encourages students to act out the social, cultural and political codes embedded in theory, not only critically, but also spatially. Students reconfigure traditional terrains of “textuality” (Scholes, 1985) through alternative modes of representation, incorporating “play” as a “serious object of politics and analysis” (Giroux, 1991a, 72). Reflections on the experience of theory theatre discuss the potential of theory as a performative medium which may open a space for “thinking otherwise” (Thrift & Dewsbury, 2000, p.428).
Time, Place, Duration: Constraints on Graphic Development in the Curriculum

Ashley Calabria, University of Georgia, United States, calabria@uga.edu

Keywords: Graphic Communication, Design Curriculum, Computer Graphics, Traditional Graphics, Professional Development

The last two decades have proven to be technologically challenging for Landscape Architecture departments and graphics professors. The shifts from hand to computer graphics have required facility changes and extensive financial commitments for software, hardware and upgrades. Even after having committed to these standards, the graphics faculty are often left to decide how much hand and computer graphics is enough to prepare students for the profession and which applications are most widely used so that a student is employable. As a graphics professor, it is a constant challenge to decipher the barrage of applicable technology and identify the value of developing hand and computer graphics in a time constrained curriculum. Finding a focus for graphic development is a difficult task for the faculty who teach it, for the faculty that support it in studio classes and for the financial burden it can place on a department.

In an attempt to clarify some of these issues, an online survey was conducted through the Landscape Architect and Specifier News (LASN) reader base providing a national view of professional graphic development. Currently, 122 firms have responded to questions such as, how much hand or computer graphics are generated in the office and what kind, what are firms looking for in student portfolios and what software are they using. LASN statistics will be presented along with summer 2012 surveys that were sent to our department’s interns and their employers to identify a variety of graphics uses and student skill sets with the intent to garner a better understanding of professional needs, to interpret trends in hand and computer graphics and to consider timing, place and duration of graphics development within curricular constraints.

The findings show a variety of interesting statistics such as the lingering amount and value of hand graphics that still exist in offices. Just over 40% of the LASN firms still use some remnants of hand graphics. When hiring, many firms stated that computer graphic skills play an equal and sometime smaller role to some of the more traditional graphics when they look through a student portfolio. This presentation will discuss these statistics in more detail as well as applications used for graphic development in an attempt to better understand the profession and current graphics trends. There will also be some discussion on employer and intern concerns and a ranking of skill sets from employers to identify which ones are highly valued.
Trees as Signifier: A Way to Begin

Peter Osler, Illinois Institute of Technology, United States, posler@iit.edu

Keywords: trees, studio, pedagogy, planting design

Tree as Signifier: A Way to Begin will outline a five-year experiment in initiating the studio sequence in the MLA program at the Illinois Institute of Technology (IIT).

This six-week project is divided into a series of four interrelated sub-assignments. It uses one of the primary building blocks of landscape architecture—the tree—as a vehicle to investigate and address a wide range of nested issues germane to understanding landscape.

An outline of the project’s sub-assignments:

• Students research an assigned species of tree to uncover its relevant botanical, horticultural, physical, historical, and cultural characteristics. This provides a broad understanding of their assigned tree, as well as an introduction to research methods and important texts they will use throughout their career. This effort is coordinated with the woody plants course that entering students are enrolled in.

• Students then construct 1”=10’scale, highly detailed wire model of their assigned tree, including the tree’s root system. Root systems are cast into a transparent cast resin base to maintain their visibility. Besides intimately understanding their tree’s form, the painstaking modeling provides an introduction to the importance of craft, wood shop tools and techniques, and reinforces the crucial role of ground and soil—what can’t be seen—to their discipline.

• Students propose a strategy for planting nine of their trees on the IIT campus that mines as much relevant content gleaned from their research as possible. Inherent in the proposals are issues of context and legibility. Readings on Chicago history, Mies van der Rohe, Alfred Caldwell, modernist site planning, and class discussions critiquing the 1999 Campus Landscape Master Plan (MVVA and Peter Schaudt), provide an understanding of IIT’s unique modernist legacy. Lectures and tours supplement the readings. Besides a proposal’s formal/spatial implications, the poetics of temporality and maintenance are essential. Proposals are presented using drawings, models, and photographic montages. Representation techniques appropriate to each student’s concept are developed in the studio and in the coincident introductory media course.

• The final sub-assignment asks the students to augment their planting proposal with a hypothetical intervention constructed from a limited amount of plate stainless steel, using a strict set of operations (cutting, folding; no discard). This emphasizes aspects of abstraction, construction methods and detailing, and again, legibility. Interventions are represented using drawings and scale models.

• The wire tree models produced over the course of five years comprise an archive that is on public display.
Values Mapping: Encouraging Divergent Student Design Proposals

Bernie Dahl, Purdue University, United States, bdahl@purdue.edu
Sean Rotar, Purdue University, United States, srotar@purdue.edu
Ann Hildner, Purdue University, United States, achildner@purdue.edu
David Barbarash, Purdue University, United States, davidbarbarash@gmail.com

Keywords: Values Mapping: Encouraging Divergent Student Design Proposals

Faculty often challenge their students to develop designs for a common site and program. Chances of them all coming up with unique ideas are good but all too often, students tend to fixate on an idea as a class and end up with variations on a single theme instead of coming from unique directions. The authors have developed a model by which students or groups are guided through a process of clearly differentiating each design without compromising any of the ideas.

The students were challenged to develop program elements and relationship diagrams based on conversations with ‘clients’ and instructors. The diagrams express the relative size of design elements and the relationships between them.

The students were asked to generate several ‘big ideas’ for the project, thinking of the program and site but not applying their schematic diagrams to the site. They were then prompted to compare the importance of their ‘big ideas’ to the success of the site. A group discussion focused on the ideas generated by the groups.

After a class discussion of these variables, the faculty led students in a discussion of the optimum pairings that would allow the groups to differentiate the emphases of their ideas. The charting of these ‘big ideas’ ensued with group representatives placing the measured emphasis of their group on a two-axis chart.

During the remainder of the project the faculty advised the students according to their originally determined design emphases. The students all had the same site and the same program elements to fit within that site. The distinctions between the groups were maintained throughout the project.

Several benefits were achieved:
• The faculty was synchronized in advising the students because each group had its own identity.

• The students understood that they had their own unique identity and every other group would be different but equal.

• The ‘client’, a neighborhood association, could understand the various design solutions and know that they all addressed the key issues but displayed different qualities. Beyond the initial confusion of introducing a new process, the faculty and students developed a clear understanding of the controlled uniqueness and differences of the design solutions. And the entire process and presentation was clarified for the ‘client’ group. The presentation will be a walk through the process with illustrations of the charts and diagrams that were used to organize the entire process. The session will be interactive in nature.
Visualizing an Outcome Based Approach to Education: Linking Pedagogy and Practice

Lise Burcher, University of Guelph, Canada, lburcher@uoguelph.ca
Shirley Hall, University of Guelph, Canada, shall@uoguelph.ca
Natasha Kenny, University of Guelph, Canada, nkenny@uoguelph.ca

Keywords: outcomes based education, constructive alignment, design studio education

1. Overview of Outcomes Based Approach and Best Practices in Higher Education

Constructive alignment defines course learning objectives, with both students and instructor aware of the essential knowledge and abilities that they should demonstrate at the end of the course. Once the learning objectives are defined, feedback and assessment methods, providing opportunities for students and instructor to formatively and summatively assess their achievement, are articulated and developed.

Constructive Alignment
The use of Constructive Alignment begins with the end in mind, (i.e. what should students know/demonstrate at course completion?). The approach assumes intentional alignment of learning objectives, with assessment methods and teaching/learning activities substantially improving learning outcomes. (Blumberg, 2009). Constructive alignment uses a “learner-centered” approach with students, central to, the construction of meaning in their own learning.

Design Principles
Biggs (1996) Meyers and Nulty (2009) five curriculum design principles for course design using constructive alignments addressing the quality of student learning outcomes and serving as the foundation for course development.

2. Challenges in the Landscape Architecture classroom

With pressures throughout the academic realm to achieve greater efficiencies, often through increasing student ratios, the design studio teaching model traditionally employed in landscape architecture programs, is showing significant strain and calls for new strategies to address the challenge. The Constructive Alignment approach has been employed by three educators/educational development researchers in the design and delivery of core courses within the undergraduate Landscape Architecture program at the University of Guelph, Canada.

3. What is the Course re/Design Institute (CrDi)?
The Course Re/Design Institute (CrDi) is a highly interactive 4-day workshop focusing on the process and product of course design. Participants discuss, apply research, explore innovative instructional strategies, assessment approaches, and learning technologies to promote active engagement encouraging student success.

4. Data Collection and Assessment

Assessment will be conducted using components of SCEQ and R-SPQ-2F and Brookfield’s Critical Incident Questionnaire. Assessment will measure the experience and effectiveness of course redesign. Methods of Data Collection (quantitative and qualitative) Brookfield’s Critical Incident Questionnaire will be used throughout the course to collect feedback about student engagement. Questions will be based upon the five dimensions of the teaching/learning environment as described by Wilson, Lizzio & Ramsden, 1997.

- Good Teaching • Clear Goals • Workload • Assessment • Independence

5. Commitment to Continuous Improvement

Data collection and assessment of the pilot courses will provide the baseline for continuous improvement for redesigning courses with ongoing measurement/assessment.
Visualizing New Jersey Farms

Holly Grace Nelson, Rutgers, the State University of New Jersey, United States, hgrace@rci.rutgers.edu

Keywords: landscape architecture, agriculture, sustainable agriculture, foodsheds, food systems

The interdisciplinary research seminar, Agriculture + Landscape, taught in 2011 and 2012 at Rutgers, simultaneously assisted farmers while educating landscape architecture students about the ecological and social benefits of local farming. In order to increase their knowledge of local agriculture, students augmented reading and discussing farming practices with visiting nearby farms and interviewing farmers. The class started a website of New Jersey farms to teach the public about the state of farming in New Jersey while marketing local farms.

Although New Jersey is nicknamed the Garden State, most people think that New Jersey is what they see (and smell) as they drive on the turnpike past oil refineries. From here, agriculture is mostly invisible. Despite this common perception, there are over 10,000 farms in New Jersey. This multi-year “web album” class project visualizes farmscapes, farm products, and farm activities provided within the Garden State. It organizes this material on www.visitnjfarms.org, a Rutgers website that documents the extent and variety of New Jersey farms. Farm diversity ranges from New Jersey’s only buffalo farm to the first farm B&B, and new farm-restaurant hybrids. Farm activities include a sunflower maze, horseback riding lessons, and wine tasting to name a few. Students worked with a professional web designer to re-invent the website, using Real Time Farms and Sonoma County Farm Trails as case studies. They created new categories such as ‘Featured Farmer’ to enable the farmers to tell their farm’s story in their own words. Collaboration with the New Jersey Agricultural Experiment Station and with the Northeast Organic Farming Association provided a broad spectrum of farm stories. Future projects will map the farms, creating farm networks that show proximity to nearby farms, parks, trails, and open spaces. Real Time Farms (http://www.realtimefarms.com/), a crowdsourced national food system website, provided an opportunity for the class to support a larger farm database and to market New Jersey farms to a broader audience. This national website provides landscape architecture educators with a common, collective structure to gather and organize food system information. Over 50% of landscape architecture schools are within land grant universities whose mission is to provide agricultural education. If every land grant school contributed to the website, we could collectively document and spatialize hundreds of interesting American farms. Landscape architects, with our deep roots in land stewardship, should be playing an active role in the reinvention of our agricultural system.
Web-Enhanced Teaching in Landscape Architecture Construction Studios

Young-Jae Kim, Texas A&M University, United States, yjkim2011@tamu.edu
Jun-Hyun Kim, Texas A&M University, United States, jhkim@arch.tamu.edu
Ming-Han Li, Texas A&M University, United States, minghan@tamu.edu

Keywords: web-based teaching, studio-based learning, online education

Web-enhanced teaching has been widely utilized in many disciplines in US higher education. With the continuous advancement of information technology and current students’ familiarity with technology at a young age, information technology has quickly changed its role from a subordinate to an essential element in classroom. In landscape architecture studio teaching, interactivity has been regarded as one of the most important pedagogical components. The concern about web-enhanced or web-based teaching in studio courses has been that the decreased face-to-face interactivity may lower the learning effectiveness. Fortunately, positive facets of web-enhanced teaching have been proved in the higher education of landscape architecture (Buhmann & Heins, 2005; Li, 2007). However, only a few studies have been conducted by far.

This study is a follow-up investigation after the first study was conducted in 2003-2004 in assessing students’ learning effectiveness in a web-enhanced landscape construction studio course. In this study, assessment data was collected by a survey instrument in a course enrolled by 18 undergraduate and 13 graduate students. The survey focused on students’ perceived satisfaction and preference on several teaching vehicles, including in-class lectures, web-based online lectures, web-based demonstration videos, class assignments, exams, help from instructors, help from classmates in the studio, etc.

The results were compared with those from the previous study conducted in 2003-2004. The result reveals that satisfaction level on web-enhanced teaching was high, while the percentage of students who were satisfied with the web-enhanced teaching in the 2011 study was higher than the previous one (73%-87% in 2003-2004 vs. 96% in 2011). Seventy-two percent of students answered that their learning would get worse without web-enhanced teaching. In specific, graduate students had a more positive perspective about benefits from web-enhanced teaching than undergraduates. In both 2003-2004 and 2011 studies, students’ preference on learning vehicles showed that undergraduate students tended to prefer interactive learning with help from instructors and classmates, while graduate students liked more independent learning with online lectures and exercises.

This study will provide landscape architecture instructors an insight into the opportunities and challenges of applying web-enhanced teaching in studio-based courses. Particularly, lessons learned from both studies in 2003-2004 and 2011 will be summarized for those who may use a similar pedagogical approach.
Design Implementation
Design and Implementation Processes of Low Impact Development in North Texas

Alice Holmes, Dunaway Assoc, United States, Cholmes@dunaway-assoc.com
Taner Ozdil, The University of Texas at Arlington, United States, tozdil@uta.edu
Fouad Jaber, Texas A&M University System, United States, f-jaber@tamu.edu

Keywords: Low Impact Development Practices, BMP's, Planning

This research evaluates the design and implementation processes of Low Impact Development (LID) practices in the Dallas - Fort Worth (DFW) area in order to gain clear understanding about their effects and integration in to urban environments. The research concentrates on how various disciplines, specifically landscape architecture and engineering, approach a design or a construction using LID. Additionally, what are the influences that have helped designers choose LID practices over conventional planning strategies? In 1999, EPA instituted the implementation of "techniques, measures or structural control to manage and improve the quality of stormwater runoff" otherwise known as Best Management Practices (BMP) (EPA, 1999). These strategies are designed to address flow control, pollutant removal, and pollutant source removal. As part of the list of techniques associated with BMP’s, one in particular has become a more strategic approach that mimics predevelopment hydrology which is known as Low Impact Development (EPA, 2004). LID practices have emerged as the new alternative to conventional planning strategies, yet very little is known about their design and implementation regionally.

This research concentrates on various, LIDs implemented regionally using qualitative in-depth interviews with professionals (Taylor et al, 1998) and site observations (Marcus et al, 1998). The research evaluates the implementation of LID techniques that included permeable paving, rain garden/ bioretention, and green roofs by utilizing 10 interviews with professionals that have designed or implemented LID in the region. While the interviews concentrate on; the definition of LID, experience with LID, differences in process between LID and conventional techniques, design and implementation of LID, and value of LID observations attempt to document site specific design and implementation concerns.

This research illustrates that there are differences in design and implementation of the varying types of LIDs among the disciplines of landscape architecture and engineering in DFW, and the decision to choose LID over traditional methods seem to lies solely with each professional that is involved in the design and construction process. Through the interviews a common theme appeared to be that economic factors played a significant part for all professionals in LID practices only when it came to the implementation stage of design. The learning outcomes of this presentation are to include but not limited to; (1) introduce what LID is and explain its significance, (2) Illustrate the varying views of professionals on the design and implementation of LIDs, (3) Explore the acceptance and the adaptations of LIDs in DFW region.
Editing Emergence: The Generative Capacity of Maintenance as a Design Instrument

Michael Geffel, University of Virginia, United States, mg9dt@virginia.edu
Teresa Gali Izard, University of Virginia, United States, teg2q@virginia.edu

Keywords: emergence, maintenance, experiment, ecology, exhibition, practice, process

Just as the creation of a garden is not immediate, only coming into full existence through gardening, the construction of landscape is an ongoing cultural practice involving a host of actors across varying scales. Yet despite a long-held reverence for landscape process, contemporary designers often mediate the landscape entirely through digital technology, ending their commitment to the project following construction. Not only can this professional model marginalize the material and experiential qualities of the medium, it also narrows the landscape architects ability to engage with process. Ironically, within this context, it may be that the landscaper has more potential to collaborate with landscape dynamics, guiding change through the everyday social practices of maintenance.

The existence of a landscape is intrinsically bound to the actors that maintain it, that “enable a condition to continue in being.” Under this definition, maintenance is not conservatively locked into a preservation role, but operates as an assertion, an alliance of actors that together continually recreate an event at the expense of other forces. As an alternative method to engage the medium, ‘editing emergence’ demonstrates the generative capacity of landscape maintenance and how it can be utilized as a design instrument.

This presentation showcases a series of experimental maintenance exhibitions which use mowing—a symbol of human control over nature—to create space, define form, and increase ecological diversity. By altering mowing height and sculpting the micro-topography of a transitional meadow based on a light gradient, these exhibitions demonstrate the principles of a maintenance design practice where:

Existing conditions generate design intent
The specific materials of site become the maintenance design palette
The formal logic and economy of tools mediate design
Intervention is adaptive, incremental and attentive to schedule
1:1 physical experimentation is allowed and encouraged
Economy of operations increases design accessibility

While maintenance is typically communicated through specification, this poster illustrates how a designer may graphically represent site conditions, material palette, formal logic, and intent of a maintenance design. Finally, these exhibitions offer an alternative pedagogical model for landscape students through direct engagement with the medium, and an alternative professional model for landscape architects to extend their scope of practice to sites that lack the funds for capital improvement.
Industrial Labyrinth in the Heart of Birmingham

Pratisha Shakya, Auburn University, United States, pzs0027@auburn.edu
Charlene LeBleu, Auburn University, United States, leblecm@auburn.edu

Keywords: Industrial labyrinth, Leisure, Culture, Claustrophobic, Hyper nature, Ecology, Riparian, Landmarks

Rotary club, one of the world’s largest clubs, has partnered with City of Birmingham, Freshwater Land Trust, Operation New Birmingham, and Railroad Park Foundation to work on a strip of land which extends from 20th Street to 24th Street through first avenue North in downtown of Birmingham. This site named as “Line Park” was the site where seven of us from our class (Masters in Landscape Architecture, Auburn University) spent five weeks in Birmingham during our summer studio 2012. All of us came up with our own. Big ideas were generated on “Minimalism” concept. The main objective of this project was to convert the abandoned railroad line to a bicycle and pedestrian friendly greenway that will connect Railroad Park and Sloss Furnaces. The precedent for my design was Parc de la Villete, one of the largest park in Paris. It inspired me to look through the combination of leisure and cultural activities creating movement through the park.

The site is linearly elongated and depth goes below the street level on both sides of the site which gives people a claustrophobic feeling. Therefore, my big idea is to create interrelationship between site and road above it and engaging people from road into and out of the site. For this, I propose a projected trail, which helps in interacting all the vehicular roads that traverse the ground plain of the site. Through this, people can experience the industrial history of Birmingham while walking through the four different levels of the trail on the site. The industrial history is experienced through the materials like iron used for the projected trail creating an industrial labyrinth throughout the site. Ecologically, the site will be allowed to grow on its own creating hyper nature in the busy industrial city. The ground trail links with the wetland, which adds up the cool and riparian experience for people visiting there. I also propose three different landmarks that represent Railroad Park, Sloss Furnace the abstract combination of Railroad Park and Sloss Furnace.

Therefore, the notion of my design is to reciprocate industrial feel of Birmingham city via Minimalist approach.

Learning Outcomes:
- Explain the connection of site with past and present experience of Birmingham city.
- Analyze the relationship of four different projected trails.
- List the reason for people to engage on the site.
- Critique and compare on design proposal of industrial labyrinth with the history of Birmingham city.
Internal Water Storage Layer To Improve the Performance of A Texas Field Bioretention Cell in Treating Urban Highway Runoff

Ming-Han Li, Texas A&M University, United States, minghan@tamu.edu  
Mark Swapp, Texas A&M Transportation Institute, United States, mswapp@tamu.edu  
Myung Hee Kim, Texas A&M Transportation Institute, United States, myungheekim@neo.tamu.edu  
Kung-Hui Chu, Texas A&M University, United States, kchu@civil.tamu.edu  
Chan Yong Sung, Keimyung University, South Korea, cysungg@kmu.ac.kr

Keywords: stormwater, pollutant removal, bioswale, low-impact development

The purpose of this presentation is to provide the final updates of a five-year long bioretention research project sponsored by Texas Department of Transportation (TxDOT) (Li et al., 2011; Li et al., 2012). The preliminary and laboratory results of the research were presented at the 2010 and 2011 Council of Educators in Landscape Architecture annual conferences, respectively.

In this follow-up presentation, the research team will present the field study that includes the design, construction, testing and monitoring phases. The field study compares the performance of a bioretention cell with and without an internal water storage (IWS) layer in treating highway runoff in the hot, semi-arid climate of central Texas. Synthetic and natural runoff tests were conducted for performance evaluation. Flow and rainfall were measured to evaluate the hydraulic performance in peak discharge reduction and detention time extension. Pollutant removal efficiencies were calculated using the event mean concentration for total suspended solids (TSS), copper (Cu), lead (Pb), zinc (Zn), total nitrogen (TN), nitrate (NO3-N), ammonia (NH3-N), total phosphorus (TP), and orthophosphate phosphorus (HPO4-P). Constituents in the soil media were also analyzed over the course of the study. Results reveal that both designs with and without IWS reduced peak discharge and extended detention time significantly while the IWS design performed better than the non-IWS one. For water quality performance, the non-IWS design layer removed TSS, Cu, Pb, Zn, and TP to varying degrees of efficiency but TN removal is minimal. Adding an IWS layer significantly improved removal efficiencies for TSS, Cu, Zn, nitrogen and phosphorus. The soil media used in the cell accumulated Cu and Zn over time but nitrogen or phosphorus remained low.
Landscape of Stone and the Art of Construction: The Partnership of Lawrence Halprin and Stone Mason Edward Westbrook

Judith Wasserman, University of Georgia, United States, judithw@uga.edu

Keywords: Lawrence Halprin, Edward Westbrook, Stone Construction

The art of building landscapes extends beyond design. Developing a positive working relationship with the contractor expands design possibilities. It is through a high level of trust and a mutual respect for craft that such a collaborative relationship is possible. This was the case of Lawrence Halprin’s relationship with Stone Mason Edward Westbrook.

In the later phase of his working years, Lawrence Halprin increasingly used stone as a design medium. He first met Stone Mason Westbrook while working on a small project in the Bay Area. A year later he hired Westbrook as contractor for a large estate project in San Francisco, and went on to complete numerous public and private projects with Westbrook including the entrance to Yosemite, Stern Grove Amphitheater in San Francisco, Alcatraz, and San Francisco Letterman campus of the George Lucas studios.

The notable aspect of this relationship is Halprin’s high level of involvement in all aspects of stone selection and construction. On site and in the quarry, Lawrence Halprin worked directly with Westbrook and his staff explaining not only the product, but also the process and intent of the work. Through working directly with those building the design Lawrence Halprin insured a heightened knowledge of the project and its deeper significance. According to Westbrook, Halprin’s hands-on involvement, and direct contact with the workers was unique amongst the architects he had worked. Halprin educated all of those building the work on the total concept of the project – in short, inviting them to take part in the work. Construction is a critical step in design. Successful implementation insures the design vision was realized. Halprin’s perfectionism required a trusting relationship with the contractor, and an intense involvement with those actually on site building the work.

This narrative is an assemblage of interviews and site visits with Edward Westbrook coupled with an examination of construction notes from the Halprin archives. It is the study of a working relationship of craftsman and designer. The success of Halprin’s stonework relied on the high level of attention to detail and craftsmanship. Halprin encouraged the staff on site who were building the work to be part of the process through his respectful approach to meeting with them and explaining the design. It was through this close and trusting working relationship with contractor and construction staff that the design integrity of Halprin’s projects were realized.
Mainland Quality: Meaning and Endurance in China's Contemporary Landscape

Scott Melbourne, University of Hong Kong, Hong Kong, melbourne@hku.hk

Keywords: China landscape architecture design implementation construction build quality

It’s a love/hate thing.

With blistering growth and an insatiable appetite for outside expertise, designers continue to be rewarded with projects of remarkable scope and scale in Mainland China. These same conditions that open up such opportunities also set the stage for disappointment, however, with low-quality implementation too often not meeting the designers’ original vision or standards.

The purpose of this study is to assess built works of landscape architecture in China and glean lessons for how future projects may maximize the likelihood of fulfilling design goals. This study is being performed in the context of one of the largest building booms in human history, in a place that is—for all of its dynamism and variability—likely to continue playing a prominent role for the discipline in the years to come.

More than thirty of the country’s highest profile projects have been investigated and documented through in-person examination. While these works span a wide range of project types such as parks, plazas, cultural institutions and more corporate environments, special attention is paid to "event landscapes" built for the Shanghai Expo, Xi'an Horticultural Expo and Beijing Olympics.

Weakness in construction implementation is a common condition with many of these projects, but just as significantly, so is a disconnect between target program activities versus the realized uses and degree of accessibility offered by these sites. These unanticipated uses at times signal the vitality and adaptability of surrounding community groups, but more often highlight deficiencies in the design process for implementing works of meaning and endurance.

A critical understanding of the forces driving a given project proves to be essential for designers intent on contributing relevant works. This and other learned lessons will present guidance to practitioners and offer insight to all who seek to better understand the distinct forces at play in this remarkable region.
Material Reuse in the Landscape: The Feasibility of Reusing Wood in Landscape Construction and Design

Christopher McDowell, University of Georgia, United States, cmcd1@uga.edu
Katherine Melcher, University of Georgia, United States, kmelcher@uga.edu

Keywords: Materials Reuse, Reclaimed Wood, Sustainable Landscape Construction, Deconstruction, Recycling, Industrial Ecology, Construction Ecology, Life Cycle Assessment, Closed Loop Systems, Waste Management, Green Building

Wood reuse is an effective technique for reducing human impact on the landscape and additionally has much untapped potential in bringing economic, environmental and cultural benefits to the field of landscape construction and design. Designers have a professional and ethical responsibility to address the challenges associated with conventional practices of landscape construction, such as the over reliance on specifying virgin building materials, which have grave consequences to the planet in the form of natural resource depletion, habitat destruction and heightened pollution. Reuse, an essential component of the green building movement, offers an alternative method for landscape architects and designers to view materials in terms of life cycles as opposed to single-life disposable products.

This study specifically examines whether reusing wood is a practical design tool for landscape architects and construction professionals compared to traditional applications using virgin wood products. The overall method of this study in investigating the effectiveness of wood reuse is to gain experiential knowledge and produce tangible evidence through the physical construction of three common landscape items utilizing three common types of wood waste followed by a thorough review of landscape design and construction professionals. Each of the three wood waste prototypes is measured against a comparable and readily available conventional landscape product composed of virgin wood materials. All products are evaluated according to five key design criteria: aesthetics, affordability, durability, efficiency and ecological impact. The study concludes that reused wood prototypes scored highly in all categories of design criteria in comparison with the conventional virgin wood products; however, there are numerous issues that thwart mainstream application of reused materials in landscape construction and design, thus significant reform must take place within the construction industry for reuse to be widely accepted.
Panel: Vegetative Roof Plant Establishment in the South Central Plains: Findings, Challenges and Lessons Learned

David Hopman, University of Texas at Arlington, United States, dhopman@uta.edu
Reid Coffman, Kent State University, United States, rcoffma4@kent.edu
Bruce Dvorak, Texas A&M University, United States, bdvorak@arch.tamu.edu
William Fleming, University of New Mexico, United States, fleming@unm.edu

Keywords: green roof, vegetative roof, non-temperate sustainability, south central plains

Possessing populations exceeding 25 million and urban growth rates leading the nation, the South Central plains are accelerating the pace of sustainable development practices in order to provide the region with a viable future in an era of global climate change. However the region requires common national practices to be carefully adapted in order to perform in the extremely variable weather conditions of, drought, flooding, and the high temperatures extremes encountered in the area. Texas and Oklahoma experienced the two hottest average summer temperatures ever recorded by any state in 2011. Vegetative roof systems, or green roofs, have been shown to deliver a spectrum of essential ecosystem services in more temperate locations. These services result from viable plant communities proven in those regions. The panel members have responded to the dearth of knowledge about the establishment and survivability of plants on vegetative roofs in the Southern Plains with experimental extensive green roofs in Oklahoma City, Oklahoma, Arlington and College Station, Texas, and Albuquerque, New Mexico. Lessons learned from the four studies below will be presented. They are:

1. The first extensive green roof in North Texas, installed in 2008, with 4 inches of growing media. The 1,000 sf. roof tested over 40 plant species, two roofing systems, two irrigation systems, and two contrasting growing media.
2. This study, begun in 2009 in College Station, Texas, investigated twenty-two species of plants and water conservation practices. Plants were established with 5.3 mm of irrigation per week for several months and then irrigation was terminated. Five species thrive without irrigation and seven other species have performed with varied survival rates.
3. Begun in 2010 in Norman, Oklahoma, this study, examines the establishment of exotic sedums and native short grass prairie plants in two depths of media through both plug and seeding application methods.
4. This study monitored a roof at the University of New Mexico for thermal efficiency in the summer. 8 inches of soil is planted with a dozen native grass and forbs species and is watered from cisterns that supply adequate rooftop water during normal precipitation years.

The panel will provide knowledge to educators regarding plant selections for more arid regions. Moreover, it will allow for essential inquiry and discussion regarding the adaption of the practice in non-temperate locations. From this panel, researchers will be able to direct future investigations and educators will be able to guide curriculum programs appropriately.
Stakeholders' Perception on the Design and Feasibility of the Fused Grid Street Network Pattern

Hong Mang, University of Texas at Arlington, United States, hong.mang@mavs.uta.edu
Taner Ozdil, The University of Texas at Arlington, United States, tozdil@uta.edu

Keywords: fused grid, design, feasibility, physical realm, benefits, street pattern, pedestrian, green connectors

The research assessed the opinions of stakeholders including designers, planners and developers as well as professionals who have expertise on the fused grid street network on two adopted cases in Calgary and Stratford. To better understand the relative advantages and adoptability of this street network for other cities, the study set out to find the feasibility of a fused grid as a design solution and how it affect the physical realm for pedestrians.

The fused grid is a new street pattern for laying out neighborhoods and districts. It utilizes the fusion of two traditional North American street designs: the nineteenth-century grid and the looped and cul-de-sacs of modern suburbia (Grammenos 2008). Traditionally, the street networks and land use has shaped how a neighborhood and community has thrived and flourished (Galion and Eisner 1963). This study concentrated on two documented cases in Calgary and Stratford who have adopted the fused grid. Both cities seek out for a new land use and street pattern to help reduce the impact of development on the environment while increasing the quality of life for their residents (Grammenos 2011). Yet, very little has been covered in the scholarly literature concerning the design and feasibility of fused grid.

The study utilized qualitative research methods that consisted of in-depth telephone interviews with 12 stakeholders (Taylor and Bogdan 1984) and systematic case study documentation and analyses of two adopted cases in Canada (Marcus at al 1998). Data are then analyzed using the grounded theory approach (Taylor and Bogdan 1998). The goal was to assess three areas of concerns of fused grid: (1) design, (2) feasibility, and (3) adaptation.

Learning objectives of this presentation is to:
• Introduce what fused grid is and evaluate its significance
• Identify factors that influence the feasibility of fused grid
• Learn about design implications of this pattern for the physical realm
• Learn about stakeholders’ acceptance and adaptations of fused grid

The results illustrate that the design of fused grid promote environmental benefits and support parks that are within walking distances. It is an important model for cities to adopt as it provides a safer route for pedestrians through the availability of green connectors. However, stakeholders point out its limited feasibility due to concerns over the costs of maintaining parks and green connectors. Respondents also had concerns with fused grid because existing case studies are too new to yield sufficient economic investment results.
Taking it to the Street

Terry Clements, Virginia Tech, United States, tclement@vt.edu

Keywords: park, urban street

In today’s overly busy and congested daily life, few urban residents regularly use their local or regional parks, losing out on the physical, mental and social benefits these places are intended to provide. This paper reconsiders the urban park and proposes a sixth model of urban open space specifically designed for use by today’s busy urban residents. Its time to consider the street as the place for a park. Its time to incorporate the park, or at least park-like qualities into the everyday urban outdoor spaces that metropolitan residents traverse in their daily lives: the street.

Cranz identified four models of urban park development in the United States: the pleasure garden, the reform park, the recreational facility, and open space. During the 1980s and 90s, the ecological or ‘sustainability’ park model took hold, emphasizing visible ecological function, sometimes over community use. As another era of park development rises in response to contemporary urban development and advances in communication technology, it is time to consider an expanded role and location for parks and park-like experiences.

This paper presents the results of research investigating the tangible and intangible qualities of parks that contribute to a park user’s sense of a park and what makes going to a park a desirable experience. A matrix of park qualities contributing to one’s sense of well-being and community health was developed using literature on parks and park values since the late 1800s as well as on urban walkability. Contemporary urban park activities, and associated landscape furnishings and elements were identified from case studies of contemporary urban parks in North America and Europe. These contributed to development of guidelines for the redesign of urban streets to incorporate park-like qualities that could enhance pedestrian experiences along the streets while respecting the streets as places of pedestrian, bicycle and motorized circulation. Case studies of built projects and projective student projects demonstrate how these park-like qualities can be incorporated into the everyday urban place of the street.

By bringing park-like qualities to the place that urban residents already use during their daily routines, the street takes on a more significant role. As streets are made more park-like, they can provide opportunities for desirable park-like experiences and benefits. This proposes the park as not just a place, but as a condition for contemporary urban streets.
The Art and Craft of Detailed Design in the Sustainable Era

Kris Fox, University of British Columbia, Canada, kfox@sala.ubc.ca

Keywords: Landscape design, sustainable building materials, landscape building materials, landscape construction, post-construction

“One of our main contributions as designers is not the scale at which landscape projects are conceived and executed, or the scope of the work, but, rather, the quality of design thought and precision of design execution that are brought to the detail parts.” Kirkwood, 1999.

In the time that has passed since the publishing of The Art of Landscape Detail (1999), much of the focus in landscape architecture has been on green or sustainable building. In this same period of time, however, the well-deserved attention paid to sustainable design has overlooked the art and craft of its details. The recent literature on sustainable building materials and construction has covered sustainable principles (Thompson, 2008) and individual materials (Brownell, 2006; Margolis, 2007; Zimmermann 2009), but has not yet melded these realms together with the design process and with technical design. The goal of this paper is to identify design projects that have incorporated ‘newer’ sustainable landscape building materials and techniques, and have also considered the beauty of this work and the way users might interact with it.

The sustainable movement, as related to landscape construction materials, has not yet had the opportunity to connect to craft and design process in part because the catalog of available materials is an ever-moving target. This fragmentation becomes evident in the design studio environment where students frequently view sustainable principles and technical execution and craft as existing in separate realms. They will craft projects to save the world, but rarely get to a level of detail where the execution can be figured out in detail. It is also present with non-designers who are inundated with numerous individual materials and their perceived green function rather than aspects of the execution of a project’s construction. As the sustainable movement matures and the sustainable materials explosion calms, reintegrating holistic thinking about design, the craft of materials and execution will hopefully be what this period will be remembered for. And now is the time to begin this critical reintegration process.
Urban Landscape Stormwater Mitigation: Green Walls as a Tool

Barry Kew, Pennsylvania State University, United States, bwk2@psu.edu

Keywords: Stormwater Mitigation, Green Walls, Monitoring Equipment, Irrigation

Facilitating stormwater capture in largely impervious urban landscapes is one of the most challenging tasks that face designers seeking to improve environmental quality [1]. Roofs often make up a large percentage of imperviousness in urban environments. It is understood that by introducing vegetation on roof-tops, stormwater retention is increased [2] among several benefits. Likewise, the potential to improve urban ecosystems through the mitigating of dust, forming of habitat creation, and improve urban microclimate [3] with the introduction of green walls has been established, but how have these mechanisms mitigated stormwater? This paper presents experimental results of green wall stormwater capture effectiveness and support a plant mixture for the Mid-Atlantic United States.

The objective of this study is to determine the amount, frequency, and pattern of irrigation to support a healthy green wall system. The lack of local quantitative performance data and modeling tools explains the limited use of green roofs for stormwater mitigation [4], which also holds true for green walls. A replicated series of green walls each containing the same four different plant species and each integrated with a drip irrigation system fed by reservoirs were designed and installed. Each system series simulates cycling runoff captured from 500 square feet of roof. Green wall simulations were monitored over two growing seasons with four simulations having NE solar orientation and four having SW orientation. By using monitoring equipment to measure water volume, soil moisture, ambient temperature, and surface temperature, data were collected to determine conditions that support a healthy green wall. Using timers on pumps, an experimental pattern of irrigation was monitored and recorded.

The results draw attention to the relationship between stormwater runoff and the green wall surface area. With each green wall system surface area measuring 40 square feet, a relationship was found between surface area of runoff and green wall surface area. It was also found that the plant arrangement on the wall had effects relative to a healthy wall system. This result suggests that a flexible irrigation delivery system with sensors be included when designing, specifying, and implementing a green wall system. This interactive presentation will feature a replica of replicated green wall system. Discussion of what is working, what is not working, and considerations for future analysis will be invited as part of this presentation since the actual experimental system continues to be monitored for a third growing season.
Vulnerable by Design: Consequences of Infrastructure Failure in the Sacramento-San Joaquin Delta

John Radke, University of California, Berkeley, United States, ratt@berkeley.edu
Tessa Beach, University of California, Berkeley, United States, t.bernhardt@berkeley.edu

Keywords: Levee Failure, Accessibility, Transportation, First Responder,

Analyzing impacts of catastrophic environmental events on critical infrastructure systems is crucial to identifying vulnerabilities and facilitating sustainable system design at the nexus of the natural and built environment. California’s Sacramento – San Joaquin Delta, once an extensive marshland system, today incorporates approximately 70 reclaimed islands enmeshed between the channels of the Sacramento and San Joaquin rivers and maintained by 1,100 miles of constructed levees. These islands are host to a built landscape containing numerous, interconnected and interdependent critical infrastructure systems including electrical and gas transmission grids; water supply projects; and road, ship, and rail transportation networks. All face extreme risk of catastrophic flooding due to levee failure. This study identifies vulnerabilities to such flooding inherent in the design of the Delta’s transportation network by modeling the consequences of 22 different island inundation scenarios. The method is universal and the metric can be applied to any designed landscape infrastructure, however we illustrate its effectiveness on the transportation system’s reliability during catastrophic landscape failures.

Transportation network vulnerability is characterized by significant reductions in accessibility due to road loss caused by levee overtopping. Other studies have quantified impacts to network accessibility as a result of single flooding scenarios using aggregated county-level data. However, such aggregate data leads to uncertainty in modeling while the investigation of a single flooding scenario fails to identify landscapes that experience consistent vulnerability. We use a modeling methodology embedded in a GIS to measure the impact of levee failure on first responder accessibility to individual households within the Delta across numerous island inundation scenarios. For each inundation scenario, we remove all roads on an inundated island from the regional transportation network, calculate the impact on the probability of first responder accessibility throughout the region, and map changes from the baseline scenario. Combining changes in accessibility under all 22 flooding scenarios, we identify landscapes of high vulnerability as those that experience a decrease in first responder accessibility throughout a wide range of potential flooding scenarios. A design flaw is revealed.

The reliability of the Delta’s transportation network is extremely dependent on complete connectivity, a hazardous design that does not account for the high flooding risk posed by the landscape in which it exists. Our methods and findings are extremely relevant to design and planning of critical infrastructure systems in extreme landscapes and can facilitate designs that improve sustainability through better understanding of potential vulnerabilities posed by catastrophic environmental events.
History, Theory & Culture
"Transit Deserts": The Theory of Long Term Placed-Based Transportation Inequities

Diane Jones Allen, Morgan State University, United States, diane.jones@morgan.edu

Keywords: "Transit Deserts" neighborhood physiography, transit access, urban oriented populations

Within the past five decades, public transit dependent, urban oriented populations have been relocated, by urban renewal and redevelopment, to outer-urban, auto-oriented neighborhoods at rates equaling the Great Migration of African-Americans arriving in American cities during the preceding five decades. This new forced migration has often ended in places with limited public transit service access, resulting mostly from suburban or low density physiography or form tied to an urban design philosophy, privileging the automobile. These areas of relocation are unable to offer the transportation necessities that insure employment and accessibility to social and cultural networks, once common place to the transplanted urbanites before they moved were moved. This research identifies these neighborhoods burdened with long-term and reoccurring place-based transportation inadequacies as “Transit Deserts”. Public transportation thrives on particular urban forms both shaped and sustained by an ever-increasing population density. Urban renewal and reconfiguration is just that, a focus upon the regeneration of a particular urban space. The relocation of inhabitants of the designated urban space is at best a secondary consideration, as can be sited in HUD Hope VI and now HUD Choice Neighborhood research. Often poorly designed representations of, or recently evacuated American suburbs, are based upon an arrangement of the urban form representing a decreased density conversely tied to the demand for automobile transportation and infrastructure. Public entities make transportation decisions based upon physical signs of decreased density of populations and housing. Justifying public transportation travel modes and access are obscured by the very form and occupancy patterns within a “Transit Desert”. This paper investigates the current trend, of relocating those less affluent and heavily dependent on transit, to outer-urban areas, and how this relocation puts increased demand on areas of decreased capacity and service. The historic principals driving the creation of American public transportation and the ones creating American urban renewal and reformulation have served complimentary outcomes within the urban framework, but opposing outcomes in the outer-urban neighborhoods of relocation, creating the “Transit Deserts”. This paper will center on rethinking the theories and principals driving American public transportation strategies and urban reformulation strategies within the “Transit Desert”. These theories will be analyzed in three case study sites through a method of examining the form and physiography, demographics, transit access and availability, and spatial patterns of areas that can be described as “Transit Deserts”.
A Revised Blueprint for A Dryland Democracy

Laurel McSherry, Virginia Tech, United States, lm@vt.edu

Keywords: US history, water, political geography

Environmental historians credit 19th century geologist John Wesley Powell as a pioneer in modern watershed planning. His response to western water scarcity, the 1878 "Report on the Lands of the Arid Region," called for the creation of a system of hydrographic districts — or commonwealths — empowered to “make their own laws for the division of waters, and the protection and the use of forests and pasturage.” The proposed presentation uses the context of the 2012 competition “Drylands Design: Retrofitting the American West,” to explore some of the contemporary implications and obstacles to Powell’s commonwealth approach. We begins with discussion of US political geography and its relation to water. Political geography concerns itself with the spatially uneven outcomes of political processes and the ways in which political processes are themselves affected by spatial structures. Forty-four of the fifty US states utilize rivers or portions of rivers as political boundaries. Because rivers fall in the center of drainage basins, however, their use as political boundaries fails to account for the actual resource geography of water. This political geography constitutes an organizational architecture that precedes, constrains, and produces site architecture. In an attempt to highlight some of the flaws with the current system, we return to Powell’s call to re-align America’s political landscape coextensive with its water resource base, and speculate at the macro (national) and micro (regional) scale on replacing the boundary configurations of the current fifty states with a mosaic of commonwealths corresponding to the hydrographic basins of principle rivers. However, because contemporary conditions differ than at the time of Powell’s writings, merely redrawing political boundaries to watershed borders still leaves numerous conflicts between political geography and water resource management. Through a series of watershed modification maps produced using USGS data, we will illustrate how various infrastructures across the United States — e.g., dams, canals, aqueducts, pipelines, and pumping stations — have created a series of artificial watersheds that fall outside Powell’s surface drainage framework. The presentation concludes with some thoughts on a revised commonwealth approach capturing contemporary realities such as regional aquifers, trans-border watersheds, and inter-basin transfer.
Achille Duchêne and the Revival of Treillage

Natsumi Nonaka, University of Texas at Austin, United States, nnonaka@austin.utexas.edu

Keywords: Treillage, Garden, Space, France, Belle Époque

Treillage (trelliswork structures created by carpentry) is a fascinating but somewhat obscure art that played a significant role in French garden design. Originating in antiquity and flourishing from the Renaissance, it was used extensively in the Gardens of Versailles and theorized by André Jacob Roubo in L’art du treillageur ou menuiserie des jardins (1769-1775). Henri Duchêne (1841-1902) and Achille Duchêne (1866-1947), father and son landscape architects, have been frequently considered together for the crucial role they played in the restoration of French formal gardens. While both are proponents of the French regular style in the tradition of André Le Nôtre, the fast-changing social environment around the turn of the twentieth century was more acutely reflected in the designs of Achille. In the early 1900s, the decline in the ownership of vast properties caused an increase in the demand for smaller urban gardens and simpler schemes. A significant design strategy adopted by Achille Duchêne to address this issue was the effective use of treillage structures.

Duchêne employed treillage not just to add a variety of perspectives to his enclosed gardens, but also to create a more nuanced garden experience by means of the ambiguous spatial character of these translucent and diaphanous structures. The purpose of the present paper is to investigate how Duchêne achieved this purpose and to contextualize his use of treillage in the context of the Belle Époque, during which trelliswork structures again became popular and were used extensively in the world exhibitions.

The paper will examine Duchêne’s drawings of selected sites as well as the present state of those sites. These include both city gardens and suburban estates, from Hôtel Matignon and Condé-sur-l’Iton, where the treillage structure is used as a visual focus of the garden, to the Palais Rose, probably the most important and most elaborate of Duchêne’s treillage designs, and the Palmarium at Albert Kahn’s garden in Boulogne Billancourt, which emphasized both the treillage structure itself and its interior space.

Duchêne is important not just for the sensation of space he explored through the use of treillage structures in the age of modernity but also for his broad clientele and the universality of his designs. He created gardens not only for clients in France but also in the United States, Holland, Belgium, Germany, Italy, and Russia among other countries. The designer-patron relations in these cases became channels of transmission for the art and form of treillage.
American Vauxhall Gardens and the Emergence of Nightlife

Anne Beamish, Kansas State University, United States, abeamish@ksu.edu

Keywords: Vauxhall, pleasure gardens, nighttime, nightlife

The purpose of this paper is to investigate the development of the 18th-19th century American pleasure garden and its role in making nighttime more accessible in New York, Philadelphia, and Boston.

American pleasure gardens are far less familiar than their London counterparts such as Vauxhall, Ranelagh and Cremorne, which were well-known for their extravagant and exuberant entertainment. In fact, the English gardens were so familiar to the middle-class public that American entrepreneurs called their own modest gardens by the same names. Period newspapers, magazines, and government documents were used to explore the role that these privately-owned gardens played in expanding social life, especially at night, for a broad spectrum of society.

The American gardens, though somewhat milder in their pleasures, were instrumental in allowing city residents to “colonize” the night. Polite society needed a destination and a way to travel safely and the American east coast “Vauxhalls” played a role in both. First, they provided a destination with “innocent recreation,” which included opportunities not only for socializing and entertainment, but also exposing residents to new music, food, ideas, and technology.

Second, it was the exposure of the public to the newly-invented technology of gas lighting that led, albeit unintentionally, to safer streets. Eighteenth- and early nineteenth-century nighttime was not a particularly safe time. Street crime was always a possibility but it was the darkness that made travel in the streets at night perilous. There were endless hazards from piles of boxes or firewood to trip over, cellar doors to fall into, sewage to walk in, as well as simply getting lost. Moonlight helped and evening events were frequently scheduled to synchronize with the moon. Lanterns were also available, but they and the fuel were relatively expensive and were more successful in lighting the pedestrian carrying the lamp than the street around them. Oil street lamps were sparse and dim.

Though lighting the Vauxhall gardens with gas was originally intended purely as a novel entertainment to attract customers, the exposure led to a broader and faster acceptance by the public, which ultimately led to the introduction of gas street lighting. With better lit streets at night, more people could travel with greater safety, increasing attendance not only at the Vauxhall gardens, but at other cultural and educational venues as well.
An Aesthetic of Place in Film vis-à-vis Film as a Medium Globalization

Thomas Schurch, Clemson University, United States, tschurc@clemson.edu

Keywords: Place Theory

Purpose
This paper’s purpose is to identify an aesthetic of “place” in four films – Fellini’s Roma, The Milagro Beanfield War, Tender Mercies, and Chinatown - as exceptions to cinema’s predisposition to simultaneously affect and be affected by boundless globalization. The paper’s secondary purpose is demonstration of a quality of place in film important to landscape architecture that instructs and reinforces meaningfulness in people’s lives in contradistinction to the globalizing forces.

Background
Place is defined as conditions “. . . where we experience the meaningful events of our experience” (Norberg-Schulz in Relph 1972, 42) Similarly, places are “. . . profound centers of human experience” (Relph 1972, 43). Therefore, elements of substantive tradition, culture, and built and natural environments are requisite to meaningful daily living. Furthermore, these various elements are local and/or regional in character, i.e., bounded, and frequently the basis of “good” art through literature, painting, music, dance, and film.

Forces of globalization typically focus on markets, transnationalism, cyberspace, and, subsequently, mass communication, homogenization, and boundlessness. Globalization, therefore, is blindly destructive of place and elements of substantive tradition, culture, and built and natural environments that are requisite to providing meaningfulness in people’s daily experiences.

Methods
Method applied in this work are largely hermeneutical, i.e., interpretive. Published data pertaining to film theory, place theory has been examined and synthesized. A body of cinematic work pertinent to globalization and place has been treated similarly.

Findings
Characteristically, film is a form of boundless mass communication and therefore affects and is affected by globalization. Even when film has significant overarching themes of good versus evil, the meaning of life, pathos, slice of life, etc., it does so in universal terms. Moreover, film is an entertainment medium for purposes of escapism, vicarious experience, voyeurism, etc.

Occasionally, a film counters the medium’s globalizing proclivity, and reflects qualities of place, e.g., in the four films discussed in this paper. In the face of globalizing forces, including film, that undermines local and regional culture, such place-based films should be encouraged and recognized.

Importance
This work distinguishes between film that is universal in nature and therefore place adverse and film that is place sensitive, thereby providing examples of meaningfulness in the human experience. Through emphasis on place-based film, an aesthetic of film is practicable that reflects “. . . where we experience the meaningful events of our experience” and experience “. . . profound centers of human experience.”
An Analysis of the Spatial Structure of the National Palace of Queluz

Benjamin George, Utah State University, United States, benjamin.george@usu.edu

Keywords: Landscape history, Portuguese landscapes, Baroque landscapes

The National Palace of Queluz is often described as the Versailles of Portugal, a comparison that would seem fitting due to its stately rococo architecture, French-inspired gardens designed by Jean-Baptiste Robillon, and its later role as the primary royal residence until the royalty was forced to flee the country in 1807. However, this appellation is a misnomer, for the landscape and palace bear only a superficial resemblance to Le Nôtre's masterpiece, and though Queluz would eventually become a primary royal residence, it was not envisaged as such by Robillon (Rey, 1969). By deconstructing the spatial organization of the landscape and the building edge, we can uncover the underlying meaning of the estate and craft a modern lens through which to view this Portuguese masterpiece.

Queluz, like much of Portugal's design tradition, is a synthesis of many different styles. Already seeped in Moorish theories and techniques, Portugal was the first European power to open sea trade lanes to the Orient, and imported and relished in the artistic influences of China and India (Attlee, 2008). At Queluz, we find these influences, as well as Dutch, beneath the more domineering Baroque and formal French motifs (Ferro, 1998; Delaforce, 2004). Perhaps nowhere is this more clear than in the spatial arrangement of the site and the relationship between the architecture and the landscape (Guimarães & Carneiro, 1995).

While replete with axis, patte d'oie, grand parterres, and allegorical statuary and fountains, these familiar motifs have been altered from their common form or function. The landscape was organized around social and functional uses, and the introverted orientation of the gardens reflect the nature of Queluz as a private retreat and pleasure ground, contrasting sharply with the baroque principles of movement, projection and power. This presentation examines the complex spatial structure of Queluz through an internal analysis of the site and through comparisons to contemporary baroque and rococo landscapes. It concludes that to fully appreciate the palace’s landscape we must dissociate it from the royal palaces of Europe and embrace Queluz’s more humble origins and distinct application of baroque principles.
An Overlooked Pioneer: Reconsidering the Final Works in a Career

Annaliese Bischoff, University of Massachusetts, United States, abischof@larp.umass.edu

Keywords: design education, history of the profession

The purpose of this paper is to learn more about the evolving concerns of one of the perhaps most overlooked educational pioneers, Frank A. Waugh, who founded the Department of Landscape Gardening in 1902 at the Massachusetts Agricultural College, (now the University of Massachusetts Amherst) at a time when the profession was still emerging. How did his concerns evolve over his career, how did they contribute to the profession, and why are they not better known, a researcher may well ask. Researchers have studied relatively little about Waugh to date. Robin Karson (Waugh 2007) suggests the reason may be because he expressed himself more prolifically in writing and teaching, rather than in built works. Through an examination of selected writings specifically related to plants, Waugh's approach to the study of the landscape in the decade between 1920's and 1930's shifted. In the introduction to the reprinted 2007 edition of Waugh’s Book of Landscape Gardening Linda Flint McClelland provides a meticulous study of the changing editions of this volume from its original publication in 1899, its revision in 1912, and final expansion by Waugh in 1926. McClelland observes that Waugh articulated a formal theoretic approach to design with a sense of the poetic in his early writing. By the 1930's Waugh advocates for landscape conservation. While an understanding of the influences upon Waugh and his influence upon the profession are still emerging, McClelland points to an important turning point in his work in his Landscape Architecture articles from 1931 and 1932 beginning with the subject of roadside ecology. She suggests these may represent his finest scholarly contributions. This paper asks if his work after this point shifted away from the practice of landscape architecture and instead towards the practice of art. Beginning in 1934 Waugh took up the practice of etching to represent trees in the landscape. What may well have begun as a hobby became over the next, and last, seven years of his life his primary occupation. The paper will document and examine in more detail the quantity of his publications over the course of his professional life, highlighting the dramatically dwindling number during the last seven years, in direct contrast to the increasing number of landscape etchings. Could this shift in the focus of his work account in part for Waugh’s overlooked status within the profession?
Babylon Sisters and Labyrinthine Cities of Words

Michael King, University of Illinois at Urbana-Champaign, United States, making4@illinois.edu
David Hays, University of Illinois at Urbana-Champaign, United States, dlhays@illinois.edu

Keywords: Private Languages, Private Property, Public Space, Plato, Kant, Wittgenstein

If, as Wittgenstein demonstrates in the Philosophical Investigations, the idea of a private language is nonsensical, then what of private property? What are the ramifications of such an idea with respect to public space and private property?

Taking its cues from Plato’s idea of a City of Words in "The Republic," Kant's argument against state secrets in "Perpetual Peace: A Philosophical Sketch," and Wittgenstein’s observation in Philosophical Investigations that language is something akin to a medieval city evolving over time, this paper will consider the city as a labyrinthine set of words—peripatetic paths coursing through a park; stoics stewing over the realm of things on the stoop; Cartesian cartographers cacheing in GIS; secularists scoffing at the structures and strictures of religious architecture; and American philosophers not transcending the land, but immersing themselves into it.

Attention will be paid to the gesture of the signature, or the demarcation of space by nominalism. If there can be no private languages, then perhaps the idea of private space becomes untenable and nonsensical.
Borrowed Scenery: Public Parks in Modern Shanghai (1842-1948)

Dorothy Tang, University of Hong Kong, Hong Kong, dstang@hku.hk

Keywords: Shanghai, Public Parks, Foreign Concessions, History

The notion of public urban parks is a particularly modern conception in Chinese Cities. The first urban park in Shanghai, Huangpu Park, was built along the Bund in 1868, but access was only granted to foreigners in the various international concessions established after the Opium War. This study examines the foreign, especially western, influence on public parks built during the late Qing Dynasty and Republican era with an emphasis of their political ideologies, membership, formal qualities and relationship to urban development.

The analysis is completed through site visits, archival research at the Shanghai Municipal Archives, and a literature review of the public parks built during this particular era. It chronicles the initial development of public parks as the representation of foreign power and its later manifestation of democratic ideals, all borrowing forms of open space from western references. Although eventually designers sought to “localize” these parks through imitating forms and materials of traditional Chinese gardens, the spatial structure and programmatic intent still reflect a decidedly western influence. These large public parks inform the urban form of Shanghai, creating a highly legible landscape structure that continues to structure urban growth and development in the city today.
Chatham Village; A Look at Spatial Experiences Through Time

Julia Morrison, Chatham University, United States, jmorison@chatham.edu
Kyle Beidler, Chatham University, United States, kbeidler@chatham.edu

Keywords: Sense of Place, Chatham Village, Community Design

“Sense of place” is a common phrase of unspoken understanding and multiple meanings (Cresswell, 2004.) Many scholars have attempted to better define this term, yet no conclusive definition has been reached. Despite the evasive nature of such a term, various design professionals have insisted “sense of place” is a critical component (Ellis, 2005.) Empirical research conducted on the topic thus far has generated limited spatial conclusions, especially in the residential design realm. Therefore this research attempts to investigate the development of “sense of place” within the context of historically significant Chatham Village. Chatham Village is a residential community in Pittsburgh Pennsylvania that has withstood the test of time by resisting the declines of its post-industrial surrounds. Built in 1937 by the Buhl Foundation as limited dividend rentals, the 45-acre development transformed into an owner-operated cooperative community in 1960 (Stein 1957; Bamberg 2011.) Primarily the work of planners Clarence S. Stein and Henry Wright, the development separates pedestrian and vehicular traffic, uses superblock subdivision, and fronts 197 townhouses on central communal courts. While such form exhibits design principals characteristic of the English Garden City movement, Stein was formally trained in the Beaux-Arts, and Wright was of Modernist thought, which resulted in a democratic design defined by no single movement (Bamberg 2011; Cusack and Pomeroy 2006.) Its unique character has drawn attention from critics since opening, and in 1998 was recognized as a National Historic Landmark (Bamberg 2011.) Consistent with the ideals of its planners, Chatham Village Homes, Inc. Cooperative developed committees to oversee resident design policies (Bamberg 2011; Cusack and Pomeroy 2006.) Within the context of such a pristinely preserved and planned community the question arises: What contributes to the residents “sense of place?”

Framed as a qualitative case study, narrative interviews and survey mapping are employed as means of analyzing the development of “sense of place.” Resident experiences are cross-examined with themes in literature and designer intent to understand which design components contribute to the development of “sense of place.” Early studies suggest that the designer interests in quality community life has manifested (Wright 1930.) Additionally, the well-planned setting functions at several scales, allowing residents to take advantage of city, neighborhood, and sub-development amenities. Finally, the staggered siting of the buildings on natural terrain creates a wide variety of semi public and private spaces. Such attributions can further aid the understanding and application of “sense of place” in community design.
Cultura and the Counsel of Roberto Burle Marx

Catherine Seavitt Nordenson, The City College of New York, United States, cseavitt@seavitt.com

Keywords: Roberto Burle Marx, Brazil, military dictatorship, culture, deforestation, public parks, statues

The Brazilian Conselho Federal de Cultura (Federal Council of Culture) was created by governmental decree in November 1966, two years after the 1964 military coup initiated a right-wing dictatorship in Brazil that would last twenty-one years. Appointed directly by the President of the Republic, Humberto Castello Branco, the twenty-four counselors had dissimilar allegiances and motivations, but they all shared an interest in the national projection of Brazilian culture. The landscape architect Roberto Burle Marx (1909-1994) was an appointed counselor, serving alongside other well-known members, including sociologist Gilberto Freyre and novelist Rachel de Queiroz. Meanwhile, many other culturally significant Brazilians spent this period abroad in political exile. This conflux of culture and politics, specifically a nationalist cultural policy implemented by a military dictatorship, is particularly interesting. After the end of the dictatorship in 1985, the Ministério da Cultura was created by the federal government, and the Conselho Federal de Cultura was formally dissolved. This paper examines Burle Marx’s consular opinions from 1967 until 1971 (translated into English for the first time by the author), delivered to the President of the Republic and published in the Council’s journal, Cultura. His opinions address such issues as deforestation, the establishment of national parks, the place of commemorative sculpture in public parks, and the unique history of the Brazilian landscape. A close reading of these texts, seen in the contemporaneous cultural context of Brazil, elucidates a little-known but extremely important moment in the trajectory of Burle Marx’s oeuvre, further cementing his position as Latin America’s most significant landscape architect.

The landscape work produced by Roberto Burle Marx during the period of the military dictatorship is quite different from his work of the preceding years. The majority of Burle Marx’s projects from 1934-1964 are public parks, ranging in scale from the small town squares of Recife to the large parks executed in Pampulha, Rio de Janeiro, and Caracas. After the military coup of 1964, Burle Marx’s projects are smaller in scale and often privately commissioned. Burle Marx clearly considered his position as a Counselor as an important forum, providing a platform from which to develop and promote his ideas of the Brazilian landscape in relationship to the public realm. His opinions were read to the President of the Republic, enabling him to deliver his messages directly to the federal government. And, embedded in the texts, there are a few subtle critiques of the military dictatorship.
Deciphering Historic Landscapes: A Case Study of Slender West Lake in Yangzhou, China

Chen Yang, Queensland University of Technology, Australia, chen.yang@student.qut.edu.au
Jeannie Sim, Creative Industries Faculty, School of Design Office, Landscape Architecture, Australia, j.sim@qut.edu.au

Keywords: decipherment process, Historic Landscape, Slender West Lake, heritage value, landscape character, artistic conception, landscape pattern, landscape feature

The main focus of this paper is to present a new approach to decipher historic landscapes. Historic landscapes are the result of the accumulation of cultural and natural values and attributes, in their tangible and intangible dimensions. They constitute a key resource in enhancing the community identity and fostering local economic development and social cohesion. During the past 30 years, however, the rapid urbanization and uncontrolled tourism development have presented a huge threat to historic landscapes. On November 2011, UNESCO adopted the New Recommendation on Historic Urban Landscapes, which means that the redevelopment of historic landscapes has become a global issue. While such recommendations have started investigating heritage sites through a cultural landscape perspective, there are still inadequate practical methods that can translate cultural landscape values into effective management options, especially in China.

Slender West Lake, a 2500-year-old cultural landscape in Yangzhou, China, has been investigated as a case study. While Slender West Lake has been nominated as a National Scenic and Historic Interested Area in 1988, the reconstruction within it and the new developments around it have never been halted. Accordingly, one of the most urgent problems today is how to identify the significant landscape features and their attributes for management and conservation. These significant qualities and management opportunities of Slender West Lake have offered important evidence for exploring and testing the decipherment process. In this paper I identify six factors that constitute a decipherment process: heritage values; landscape character; artistic conception; landscape patterns; landscape systems; and, landscape features. The relationships among these factors have been examined through the case study, highlighting that the landscape character and artistic conception play significant roles in combining landscape values with landscape features. As an improved approach, finally, this decipherment process provides an operational guide to identify the significant features, both tangible and intangible, in a historic landscape; it also highlights the importance of intangible components in the conservation process; and, it presents a systematic and holistic method that elaborates the relationship between landscape components and the whole.

The attendees will learn the method of deciphering a historic landscape within a specific cultural background and social context. The attendees could also learn how to translate the intangible values or meanings of a historic landscape into tangible features, and how to identify the attributes of these features. Assessment of outcomes will be demonstrated through questions and answers; discussion; and, oral examinations.
Deluxe Jim Crow and the Equalization School Landscape of Georgia, 1950-70

Daniel Nadenicek, University of Georgia, United States, dnadeni@uga.edu
Steven Moffson, Historic Preservation Division, Georgia DNR, United States, Steven.Moffson@dnr.state.ga.us

Keywords: Jim Crow, desegregation, segregation, Brown v. Board of Education, separate but equal, preservation

Equalization Schools in Georgia, 1952-1970

In the 1950s and 1960s, Southern states embraced a strategy of massive resistance to racial integration in schools and other public places. In Georgia, massive resistance included the construction of modern schools for African-American children in an attempt by the state to appease black communities and demonstrate it could operate racially separate and equal public school systems. By 1955, the state spent nearly $275 million on new schools, including 500 new schools for African American children.

These modern schools were built in urban and rural African-American communities throughout the state from roughly 1952 to 1962. These International Style schools were larger and more advanced than previous schools for African Americans and they were a source of pride, independence, and cultural cohesion in African-American communities. By 1970, however, racial desegregation of the state’s public schools resulted in the closure of many African-American schools after little more than a decade of use. The consolidation of black and white school systems left a surplus of schools so that most African-American high schools were either reduced to junior highs, or simply closed and vacated when white school boards created integrated school systems composed of only formerly white schools.

This paper will demonstrate that the control African Americans exerted over their new schools was temporal and illusory and that their modern schools exemplify the disproportionate burden of desegregation borne by African-American communities. Interviews with former students and other archival materials will shed light on the role of modern schools in rural African-American communities and the devastating effects that resulted from the closure of these schools, including the loss of control of their schools, loss of role models in teachers and principals who were not rehired in the integrated schools, and the loss of their school history.

The paper concludes with speculation about the preservation of those buildings and their landscapes.
Designing a Riverfront Park from a West Virginia Brownfield

Kathryn Wittner, West Virginia University, United States, Kathryn.Wittner@mail.wvu.edu
Claire Jeran, West Virginia University, United States, Claire.Jeran.mail.wvu.edu

Keywords: riverfronts, brownfields, open space, green space

The Agate Marble Park is a case study demonstrating brownfield environmental restoration and open space amenity. Upstream from the Ohio River along the Little Kanawha River, the eight-acre brownfield study site sits mostly in the 100-year floodplain, located 1.25 miles from downtown Parkersburg (population 31,557), third largest city in West Virginia and county seat of Wood County. The triangular site is embedded in an industrial district in the center of the city, bordered by the river to the south, a bridge crossing to South Parkersburg on the west and CSX rail tracks to the north. The Boys and Girls Club and a former Exxon site that has been deemed a superfund site sit next to one another, across the tracks and adjacent to the site. This under-utilized, contaminated site is a critical node in the development of a greenway system being developed to provide open space and recreational amenities within the built-out city limits. The recently built Little Kanawha Connector bicycle trail currently provides the only land access, bordering the western edge of the site. The trail connects to an existing trail leading to both downtown and South Parkersburg. Informing this case study are similar sites including the Menomonee Valley Industrial Center in Milwaukee, WI, the Herman Miller Factory in Georgia and the Thomson Factory, France.

The site’s early history reveals industrial uses from the late 19th century onward comprising a Standard Oil holding tank location, a lumber yard and a marble factory with remains of a brick silo, remnants of the brick marble factory, a river dock and mooring pylons in the river. An environmental impact phase II study funded by the State of West Virginia and the EPA is currently underway. Despite industrial damage on the site, the past has created an identity. The site will be remediated and developed into an ecotourism and industrial heritage site, integrating the remaining remnants and materials to highlight its previous life. The mitigation strategy will be a part of the designed interpretation of ‘industrial heritage’. Recreational and retail opportunities include a nature center, restaurant, bike shop, boat dock and kayak rental. Additional planning, design, economic analysis, and marketing are being undertaken by West Virginia University and WVU-Parkersburg. West Virginia University’s Landscape Architecture Program developed the conceptual site design and program, including relocation of the area’s high school crew teams to proposed facilities along the Little Kanawha River.
Designing and Operating Synthetic, Self-Organizing, Sustainable Ecologies at Biosphere 2

Meredith Sattler, Louisiana State University, United States, msattler@lsu.edu

Keywords: Ecosystem Services, Trans-disciplinary, Synthetic, Self-Organizing, Sustainable Ecologies, Biosphere 2

In 1968, Clair Folsome, Head of the University of Hawaii’s Exobiology Laboratory, inaugurated the science of closed ecological systems by placing “a complete functional suite of microbes together with [water and air]...inside a closed laboratory flask in which he could measure oxygen and carbon dioxide levels, study energy flows and visually observe changes.” (1) Folsome’s self-organizing, sustainable ecologies, sealed in glass flasks, became the diagram for Biosphere 2 (B2), the largest materially closed, energetically open mega-structure ever built. Within this autonomous, ecosystem service packed mini-earth, ecologists, engineers, and landscape architects collaborated to design and construct six fully operational biomes: a rainforest, savannah, desert, ocean, marsh, and agricultural plot that would sustain eight people for two years. Utilizing original source material from B2 archives, published accounts, and journal publications, this paper analyzes the biome design strategies, and their implications for the design and evolution of synthetic, resilient self-organizing ecologies.

Early on it was determined that existing geographically-based biomes would serve as models for B2 biomes, not “…artificial simulacrum...based on statistically-determined collections of plants...” (2) Gillian T. Prance and the rainforest designers modeled and budgeted the most bio-diverse ecological system on earth, the Amazon. They selected eight highly productive micro-habitats and designed their scales and adjacencies to thrive within B2’s 2,050 square foot rainforest biome footprint.(3) Each species was collected by hand and planted, like a garden.

Alternately, Walter Adey and his aquatic designers, believed knowledge of aquatic ecological systems operation was not advanced enough to model and reconstruct the marsh and ocean biomes as terrestrial biomes were. Instead, they dug out “…huge chunks of nature, put them together, and [saw] what happened.”(4) Whole Florida mangroves, slated for development, were scooped up and trucked to B2 quarantine facilities, as were sections of Caribbean coral reef. Once sealed inside B2, these ecosystems, with the Biospherians, began to self-organize into a new Gaia system, evidenced by extinction taking its course.(5)

B2’s Missions 1 and 2 were the most comprehensive long duration life support experiments ever conducted utilizing bio-diverse ecosystem provisioning. As our climate changes with increasing speed and urban populations swell, landscape architects are increasingly asked to design somewhat analogous multi-functional landscapes which often include synthetic, sustainable, self-organizing ecologies designed to generate ecosystem services. The lessons learned from the design and operation of B2 provide valuable insights into trans-disciplinary design methodologies, total systems ecological management, and landscape performance critical to the success of these projects.
Designing and Preserving Change: An Examination of the Home of Landscape Architect James Rose

Dean Cardasis, Rutgers, the State University of New Jersey, United States, cardasis@sebs.rutgers.edu

Keywords: Design, Space, Time, James Rose, Change, Suburb, Theory

Landscape maverick James Rose is best known, along with Dan Kiley and Garrett Eckbo, as one of three students who rebelled against their Beaux Arts training, thus helping to usher the profession of landscape architecture (kicking and screaming) into the modern era. Actually, Rose spent the greater part of his career rebelling against a post-war suburbia developing all around him in Ridgewood, NJ. While he produced numerous articles and four books addressing this subject, perhaps nowhere is this rebellion more clearly expressed than in the unique built critique which was his own home (now the James Rose Center for Landscape Architecture Research and Design). Built on a tiny, left-over site, formerly a trolley stop along the Ho-Ho-Kus Brook in 1953, Rose’s magnum opus is significant for many reasons, not the least of which is that it was designed to change.

From 1953 until 1991, Rose continuously staged improvisations, as well as embarked on major transformations to the site. His initial intervention was informed by an understanding of the nature of change in design, as evidenced by his 1938 rhetorical quip, “Why should we try to preserve in design an artificiality which does not exist in life?” In 1958 he described his approach to his “house” in terms of change, “I decided to go at it as you would a painting or a piece of sculpture... to set up the basic armature of walls and roofs and open spaces to establish their relationships, but leave it free to allow for improvisation. In that way it would never be “finished” but constantly evolving from one stage to the next--- a metamorphosis such as we find, commonly, in nature.”

Today, by design, the Rose site is almost unrecognizable from his original intervention. Almost. This study chronicles the improvisations and major changes in the Rose site’s “metamorphosis,” intertwined with the changes in Rose’s family life, the changes in the site’s biological features and systems and the surrounding changing suburban context. The importance of this examination is in providing an example of an approach to design, as well as preservation, which not only acknowledges the inevitability of change, but the vital, integral relationship between people and environment over time.
Designing from the Inside-Out: Anna Halprin’s Role in Lawrence’s Search for Authenticity in Landscape Creation

Judith Wasserman, University of Georgia, United States, judithw@uga.edu

Keywords: Lawrence Halprin, Anna Halprin, Dance, Authentic Design, Sensory Landscapes

Anna Halprin is often credited with Lawrence Halprin’s development of a movement oriented landscape. While Lawrence’s observation and involvement in Anna Halprin’s dance company led to his exploration of the application of choreographic principles to landscape architecture, her influence on his work was far greater.

Many of these influences originated from Anna’s dance training under innovative dance educator Margaret H’Doubler at the University of Wisconsin. Rejecting traditional ballet or modern techniques, H’Doubler developed a unique pedagogy of dance education based on a deep understanding of human skeleton and musculature system, John Dewey’s educational philosophy, and music education. H’Doubler’s students were encouraged to learn movement from the “inside-out”, relying on physiological impetus to motion.

The ever-present skeleton in Anna Halprin’s dance studio, and her reliance on teaching dance through physiology relates directly to Lawrence Halprin’s early studies in horticulture and botany, and his later interests in landscape structure and ecology. Anna is interested in revealing human locomotion and movement using a natural or “authentic” approach to dance, and he continually examined the structure of natural processes in his hikes through the Sierra’s and Mt. Tamalpais with his notebook recordings. Both sought to pare down motion – whether human or environmental – to it’s most essential elements. Through this process, Lawrence Halprin created work derived from authentic landscape experiences, distilled to the essence of form, movement and sensory quality. Dance exploration on the outside Dance Deck at the Halprin’s home included a multi-sensory understanding of landscape. Sensory awareness was heightened through exercises in seeing, listening, feeling, and moving through the landscape. At their Workshops in the Environments, these ideas were explored with dancers and designers. These “sensory” elements in nature are often overlooked in landscape architecture practice. Designed examples include Lawrence Halprin’s work designing sound into the Lucas campus, where rocks were painstakingly arranged to offer a variety of timbers and tones. And finally, Anna Halprin is vitally interested in dance in public spaces, using the urban environments as impromptu stage sets, and challenging the audience/performer relationship. Lawrence Halprin’s work likewise offers opportunity for both performativity and physical exploration of space.

Dance is multi-faceted art form, and Anna Halprin pushes the limits of dance possibilities. Her influence on Lawrence’s work was far greater than purely ideas of motion and choreography. It extends to his search for design authenticity, sensory awareness, structural “improvisation”, and the role of performativity in landscape architecture.
Enduring Values, Shifting Themes: Patterns of Environmental Practice in Australian Landscape Architecture, 1960-2012

Catherine Evans, University of New South Wales, Australia, cb.evans@unsw.edu.au
Linda Corkery, University of New South Wales, Australia, l.corkery@unsw.edu.au

Keywords: landscape practice, environmental issues, awards

Amidst the current and diverse efforts to redefine open space as the “green infrastructure” of the city, and to link this to the imperatives of working toward sustainability and adapting to climate change, it is instructive to give thought to how, where and to whom the profession of landscape architects deliver this message. One avenue is the infrastructure of the professional organisations themselves, that is, the codes of practice, educational accreditation programs, conferences, publications and awards programs (AILA 2002, 2006, 2008).

The Australian Institute of Landscape Architects (AILA), founded in 1966, was borne out of environmental concerns, particularly what was perceived to be widespread visual and environmental degradation of the Australian landscape. While similar concerns were being expressed in other countries, Australia was experiencing an influx of population triggering rapid and widespread urban expansion with the attendant fragmentation and/or outright loss of habitat throughout metropolitan areas. Simultaneously a heightened appreciation and articulation of an Australian identity arose in the built environment professions—from which emerged the Sydney School or the Bush School. Previous research in Australia has traced the landscape profession’s response to these issues by examining national AILA conference themes and presentations (Saniga 2006). The research presented in this paper takes another angle on reading the development and growth of the profession by analysing the national awards program. In particular, the focus is on changes in the award categories—as well as the winning projects—as the categories are manifestations of ideals and/or formative debates occurring within the profession, revealing thematic patterns of professional concerns over time.

The analysis was developed by reviewing the AILA National Awards programs from their commencement in 1986, through to the 2012 awards, focusing on categories related to “environment” and/or “infrastructure” (Neale 1986). When considered in the context of key environmental projects in Australia, this analysis illuminates the degree to which the national awards program has served the promotion of the landscape architecture profession’s standing in relation to environmental issues and values. From this desktop survey, a picture emerges of a profession committed to working with the paradigm of “green infrastructure” well before that concept was named, but questions why landscape architects in Australia have not been able to leverage that knowledge and experience in a significant way at the strategic level.
Eruv: Embracing Time and Space

Isaac Hametz, University of Virginia, United States, irh2pa@virginia.edu
Isaac Cohen, University of Virginia, United States, ikc5xc@virginia.edu
Rachel Vassar, University of Virginia, United States, rv8zw@virginia.edu
Jorg Sieweke, University of Virginia, United States, sieweke@virginia.edu

Keywords: social production of space, ritual, urban form, eruv, groups, sub-groups, Judaism, infrastructure

This paper articulates and presents social-spatial theories through the lens of primary field research conducted on the Jewish practice of eruv in New York, Atlanta, St. Louis, Los Angeles, and Chicago in the summer of 2012. Translated literally, eruv means ‘mixture’, ‘involvement’, or ‘partnership’. However, in practice eruv is a physically constructed Rabbinic infrastructure that utilizes elements of the city, both civic and ecological, to enable carrying between public and private spatial domains on the Sabbath.

Through this research our primary questions have been: What can designers learn about the nuances of spatial production from studying ritual and social practice and how can these lessons be translated into praxis that shapes the built environment?

In an attempt to answer these questions, we participated in the required pre-Sabbath inspection of the eruv boundary and its connections. We walked, drove, and explored an eruv boundary within each of the five cities we visited; photographing, video taping, and drawing the materials and adjacencies that define the eruv. We met with members of local eruv committees to understand the social construction and practices that exist within and contribute to the production of eruv space. The work generated from this research elucidates the complex relational associations of socially produced space.

The value of this analysis is its approach to questions of spatial production (Lefebvre), insider/outside status (Morton), and the right to the city (Lefebvre & Harvey). The complex spatial and temporal realities embodied in the contemporary practice of eruv, provides fertile ground to explore the interaction of overlapping urban systems (spatial, temporal, social). In this context we found that eruv stands alone as both a hierarchical abstract space – defined, codified, and controlled by rabbis, municipalities, and utility companies – and an everyday social space – negotiated, nourished, and maintained by members of the Jewish community.

As a point of entry in to a larger discussion of socially produced space and human-environment interactions, eruv is a useful paradigm. The complex and often messy interaction of space and time/place and duration requires concrete examples that articulate and test the theories of contemporary discourse. By engaging the specificities of eruv practice in the context of a discussion of socially produced space it may be possible to discover new modes of understanding space, time, place, duration, and the ongoing negotiation of ritual practice and urban culture.
Falling Barns: Registers of Social and Economic Evolution in the Arkansas Ozarks

Phoebe Lickwar, University of Arkansas, United States, plickwar@uark.edu
Frank Jacobus, University of Arkansas, United States, fjacobus@uark.edu

Keywords: barns, Ozark region, family farm, agricultural history

The wind-blown, weather etched falling barn is frozen time in the landscape of the Arkansas Ozarks. Over the next twenty to thirty years Americans will watch as most of the falling barns that populate their landscape fall further into disrepair or are removed from the landscape entirely. This paper offers an exploration of the social and political particularities that reveal themselves through the marriage of landscape and built form, and creates a formal record of the falling barns in the Ozark region of Arkansas before they disappear forever.

Ozark Barns can be viewed as the physical embodiment of a social and economic evolution taking place in the Ozark region of Arkansas from early settlement in the 19th century through the present day. Their size, shape, material, and placement in the landscape are the result of the needs and lifestyles of a generation of farmers who settled land in the Ozarks during this time. These structures began as functional and utilitarian spaces, meant to endure an exposure to harsh climate and the rugged specific needs of daily use. As such, each barn embodies building and material knowledge that passed through generations of a single family. Life patterns and traditions are still faintly present in these physical artifacts that have endured the harsh natural landscape. Falling barns represent a tradition and history that is escaping our generation and will disappear entirely for generations to come when these structures eventually collapse into the land. The work and life of individuals, the spirit of new settlement, critical memories of family and the efforts it took to survive in an unsettled land, begin to disappear as these structures are overtaken by an evolving landscape.

This paper establishes critical relationships between barns and socio-economic change in the agricultural landscape, specifically the transition from subsistence farming to more economically viable forms of production, through the use of photographs, text, diagrams, and maps. It seeks to document the life, history, and struggles of farming families in the Arkansas Ozarks, utilizing personal interviews and photographic record to examine the disappearing agricultural heritage of a rapidly growing region.
Federal Metropolis

Rob Holmes, Louisiana State University, United States, rholmes@m.ammoth.us

Keywords: washington, district of columbia, bureaucracy, military-industrial complex, cold war, capital, post-military landscapes, urbanization, urban growth, urban economies

By 2010, the District of Columbia and its constellation of suburbs and exurbs—the “Washington-Arlington-Alexandria, DC-VA-MD-WV” Metropolitan Statistical Area—was the seventh-largest metropolitan area in the nation, home to nearly six million people. In at least one important respect, though, Washington is a unique aberration among major American cities: all of the others can largely be explained in terms of a history traceable to some combination of position on trade routes (Chicago at the nexus of routes out of the Great Plains), industrial prowess (Detroit and the automobile), and extractive resource geography (Houston and oil). Instead, Washington’s growth, like that of other “modern designed capitals” (Vale 1992), such as Canberra and Brasilia, has been driven by the expansion of the bureaucracy of the modern nation-state.

In twentieth-century America, that bureaucracy’s growth, which parallels the metastasization of Washington from moderately-sized capital to southernmost node in northeastern “Megalopolis” (Gottmann 1961), was fueled by three primary programs: the New Deal, the “military-industrial complex” born in the aftermath of WWII, and LBJ’s “Great Society” (Dautrich & Yalof 2012, OMB 2004). Other cities have their industrial waterfronts, factory districts, and abandoned rail lines, all of which have proved fertile ground for landscape architecture. Washington has instead a bureaucratic legacy: land use dominated by the federal government, contractors housed in planned developments in sprawling suburbs, and the detritus of more than a century of military land use, such as rings of empty forts, decommissioned anti-aircraft batteries, and abandoned missile bases.

This paper presents the cumulative content of both my research into the peculiar situation of Washington as a “federal metropolis” and research conducted by my students in a graduate studio at Virginia Tech. Our work covers historical patterns of growth within the Washington region, comparisons to both other American cities and other capitals, post-military landscapes, and contemporary bureaucratic land use at both regional and urban scales. Original maps, timelines, and visualizations build on extant bodies of research into American landscapes with military use histories, the history of landscape planning in the Washington region, contemporary interactions between economics and urban form, and the planning of capital cities. Ultimately, this research develops an initial catalog of bureaucratic landscapes, and in so doing illuminates one kind of potentially fertile terrain—often overshadowed in studies of Washington’s landscape history by the monumental and the symbolic—for the production of future works of landscape architecture specific to the federal metropolis.
Finding Common Ground: A Method for Re-Imagining National Parks

Sara Malmkvist, City College of New York, United States, sara.j.malmqvist@gmail.com
Liza Trafton, City College of New York, United States, lizatrafton@gmail.com
Ryan Morrison, City College of New York, United States, ryanmorrison@gmail.com
Denise Hoffman-Brandt, City College of New York, United States, hoffmanbrandt@nyc.rr.com

Keywords: National Historic Site, National Park Service, Nicodemus, Kansas, Studio, City College of New York, American History, logic trees, partnership wheels, agriculture, diaspora, land-ownership, park planning, design, Designing the Parks, Nicodemus web, preser

This study positions Nicodemus National Historic Site (NHS) within a new order of National Parks that reflect the diversity of 21st century America, and that reveal not just the aggrandizing monuments of American landscape and history, but the darker material and moments of our culture. Situated in a remote location in rural Kansas and telling a remarkable but little-known story of Black American Diaspora, Nicodemus National Historic Site (NNHS) has low visitation levels in a context of overall decline in visitor-ship across the National Parks and Historic Sites. By considering NNHS as a paradigm shift in park planning and design, the City College of New York (CCNY) studio sought to provoke a new vision for “Designing the Parks” and the National Park Service (NPS) as a whole. NNHS is emblematic of future parks that will present urban histories and celebrate communities that reflect the diversity of 21st century American citizens. To achieve this repositioning will require new approaches to collaborative, multi-disciplinary research and discourse. The Nicodemus Web, a system of partnership wheels and logic trees, is proposed by the studio as a research and communications tool to meet this challenge.

A key challenge for future parks will be the logistics of park establishment in areas with challenging land-ownership scenarios. Historically, National Sites have been areas set aside for preservation through government land acquisition. NNHS presents the future mode of park establishment: it must be managed within a living community in territory that is not federally owned. Tied to this requirement is a shift in the scope of the site’s interpretive mandate. As one of the oldest continuously occupied Black Townships west of the Mississippi, Nicodemus commemorates a continuum of history, not a single period of significance. NPS must take on the challenge of working within a still-living community that is the subject and carrier of American history.

The CCNY design proposal for NNHS is a sequence of Three Trails that can be experienced individually or collectively to commemorate the site as a landscape, a confluence of social, cultural and environmental forces. The ‘trail’ format affords participation through movement: walking, hiking, biking, as opposed to observation in a passive state. While the Townsite remains the core visitor experience through implementation of the Townsite Trail and the location of NPS administration, the Three Trails comprise a multi-scalar park experience that will engage Nicodemus residents, Descendants and NHS visitors.
Force of Personality: Design Decisions Though Dialogue

Sarah Georgia Harrison, University of Georgia, United States, sgharris@uga.edu

Keywords: history, regionalism, environmental design and planning

The subject of this research is to evaluate the role two individuals played in the evolution of coastal resort development, originating in South Carolina with the development of Hilton Head Island. Developer Charles Fraser collaborated with landscape architect Robert Marvin, FASLA, on a succession of projects along the coast. Their shared land ethic inspired a close collaboration and deep friendship that lasted for over 40 years.

With his development company, Sea Pines Co., Charles Fraser (1929-2002) opened possibilities for development on Hilton Head Island by proposing construction of a bridge across Broad Creek in 1957. Intent on maintaining the scenic beauty and environmental health of the area while providing upscale resort amenities, Fraser was an innovator in development. With the success of Sea Pines Plantation at Hilton Head, many developers imitated its patterns of density, design of structures, and conservation of contiguous natural areas. Many of the young associates who were trained by Fraser spread his development approach initially along the Atlantic coast and from there to the Pacific coastline. At the time of his death, Charles Fraser was president of Charles E. Fraser Co., which provides planning services to developers nationwide.

Robert E. Marvin (1920-2001) was a prominent landscape architect in the South, whose career spanned six decades. He had a passion to preserve the natural beauty of his native Southern landscape in his designs. He was known for his careful integration of built forms into the natural environment with minimal disturbance. Uncompromising in his approach to his work, his footprints led the way for the next generation of landscape architects, imprinting a land ethic in the lives and work of those that followed. His collaboration with Charles Fraser enabled him to experiment with site development methods that were sensitive to the environment and innovative in their techniques.

The focus of this paper is to document historical events in the growth of coastal development as it originated in twentieth century South Carolina, under the influence of Fraser and Marvin. Research methods included interviews with former associates, observation of project site conditions, and research of design documents and published literature.

Because their shared ideology incorporated ideas of conservation, their work established early sustainable practices. Because their methods and practices were much emulated, they had an impact on improving the quality of the inevitable coastal development.
Getting from One to Five: A Discussion of the Design Evolution of Post-industrial Site Reclamation Models

Terry Clements, Virginia Tech, United States, tclement@vt.edu
Wei Cao, Virginia Tech, United States, lafeecao@vt.edu

Keywords: post-industrial reclamation, manufactured sites, urban renewal, industrial landscape

Industries have marked the landscape in ways unique to their primary industrial processes. The extraction of raw materials reorder and reform entire landscapes. Manufacturing production introduces a wide variety of benign and fouling materials onto and into the ground and air, interrupting pre-existing natural and human systems. Transportation infrastructure introduces new lines of circulation in areas cleared and reformed to fit machine specifications while creating fragmented left over spaces. And finally industrial sites of disposal and recycling require the collection of wastes, some for permanent internment on-site and others for sorting and redistribution. In all cases, the residual effects of abandoned industrial areas are dramatic and require significant resources to reclaim the land for alternate uses. This paper presents the design evolution of reclaiming post-industrial landscapes while presenting the pattern and the language of this type of landscape. The comparison, association, categorization, organization of case studies focus on the connections and interactions between those sites themselves and their ideological, social, ecological context.

This paper presents a framework relating categories of industrial processes and approaches for the redevelopment of lands changed by these processes. This framework was developed during research intended to ground an investigation into the reconnection of an isolated post-industrial site to surrounding communities and its city.

Literature reviews and case study analyses of post-industrial developments led to categorizing sites formed through industrial practices: those of extraction, manufacturing, transportation and dumping. Case study analysis of U.S. and European post-industrial sites revealed categories of redevelopment approaches, each associated with prevailing social values of their time. These categories include: art, park, preservation – including art + park qualities, remediation – including art + park + preservation qualities, and, the most recent, generation – including art + park + preservation + remediation. Discussion of the design evolution of post-industrial site reclamation demonstrates the increased layering of desired site functions and place-making as people expect more from their landscapes.
Ian McHarg’s Aesthetics

Bo Zhang, Ball State University, United States, bzhang@bsu.edu
Xiaolong Zhao, Harbin Institute of Technology, China, zxl20050409@yahoo.com.cn

Keywords: Ian McHarg, Ecological Aesthetic, Ecological Determinism, Ecological Design,

Neither an aesthetician, nor a conventional practitioner in landscape architecture, Ian McHarg had posed an inevitable impact on the design aesthetics under the environmentalist setting. A pioneer of landscape suitability method, an eloquent speaker, and a tireless supporter of environmental movement, his impact could be more influential than any contemporary aesthetician, if not all combined. McHarg was also recognized by his ignorance and even subduing of aesthetics in landscape design and planning. Decades of scholarly efforts, such as Thayer, Jusuck, Nassauer, Monzingo, Corner, and Meyer, adjusted the view of ecological determinism and established a field of “ecological aesthetics”. Most ecological aesthetic studies deem McHarg an outsider or opponent of aesthetics. This study finds tracing McHarg’s aesthetics a topic in need, since his aesthetics, though unconsciously himself, not only represents the aesthetic attitudes and visions of many landscape planners; but also inculcates and shapes the tastes and visions of his followers. Using the chronological dimension revealing a potential evolution, this study explores (1) McHarg’s understanding of the relation between aesthetics and ecological design activities, (2) his proposal (or implication) of a methodology that can achieve aesthetic quality, (3) his critiques of historical landscape styles, and (4) his ideal landscape visions. Following materials will be examined to build this study: (1) McHarg’s writings, including books, articles, biographies, slices, and interviews, (2) the graphics that he used in his writings, and (3) the projects he participated in. The study reveals a systemic construct of McHarg’s aesthetics, which he did not realize that he had then and can be relevant to the ecological aesthetic discussion now. (1) His aesthetics evolved with his improvement of the landscape suitability model. (2) Functionalism centers his writing on aesthetics. However, his appreciations of natural objects, historical styles, and star designers reveal the imperfection of this rationale. (3) His writing and projects both suggest a typical vision for landscape preservation.
Learning from Craft: Reconsidering Professional Identity

Jenna Perstlinger, University of Colorado Denver, United States, jenna.perstlinger@ucdenver.edu
Ann Komara, University of Colorado Denver, United States, ann.komara@ucdenver.edu

Keywords: art, craft, professional identity, ethics

Due to many factors, including a decline in the status of guilds in the late 19th century, and a desire to standardize the training of practitioners through university programs, the young profession of landscape architecture decided to model its identity on that of the ‘artist’ over that of the ‘artisan’ or ‘craftsman’. However, the tenets of craft practice are far more complex than merely being a method of learning a trade, and new scholarship in the area of craft theory (Sennet 2008, Crawford 2010) allows us to re-evaluate that choice. Craft is now understood to differ from art in its relationship to economic processes, collaboration, phenomenology, methodology, the history of its own discipline, and other topics. At the same time, discourse in architectural ethics reflects numerous conflicts that are caused by the “artist” identity (Groat 1993, Harries 1997) of built environment designers. This paper avoids the discredited dogma of social theorists like Ruskin and Morris, looking instead to craft academics such as Glenn Adamson (Head Researcher at the V&A) and the late Peter Dormer, as well as craft practitioner-authors such as woodworker David Pye and potter Daniel Rhodes. Through an examination of the works of major art theorists (Danto 1983, Foster 2011) and the aforementioned craft theorists, this paper elucidates the differences between art and craft and inquires as to the implications of their divergence in relationship to today’s landscape architecture theory (Corner 1999, DeLue and Elkins 2008). It often finds that the axioms of craft more closely align with landscape architecture’s stated objectives than those of art. It advocates for the inclusion of craft narratives in today’s landscape pedagogy in order to enrich our dialogue about and understanding of the practice of landscape architecture.
Managing Heritage of South Asian Cultural Landscapes: Retrospect and Prospects

Kapila Silva, University of Kansas, United States, kapilads@ku.edu
Amita Sinha, University of Illinois-Urbana Champaign, United States, sinha2@illinois.edu
Neel Kamal Chapagain, University of Wisconsin-Stevens Point, United States, nkchapagain@gmail.com
Neha Rajora, University of Illinois-Urbana Champaign, United States, rajora2@illinois.edu
Ana Valderrama, University of Illinois-Urbana Champaign, United States, valderr2@illinois.edu

Keywords: Cultural Landscapes, Cultural Heritage, Tangible Heritage, Intangible Heritage, South Asia, India, Nepal

This panel explores the contexts, concerns and prospects of conserving and managing heritage of South Asian cultural landscapes. UNESCO defines cultural landscapes as ‘combined works of nature and of man’, which are either intentionally designed or organically evolved, resulting from religious, social, economic, artistic and/or political associations over time. The construct of cultural landscape is increasingly becoming a potent category of heritage within the domain of cultural heritage management, as it moves the heritage discourse beyond its myopic artifact and monument centric vision into a wider framework within which social, historical, ecological, and spiritual dimensions associated with material and non-material heritage resources could be understood, conserved, and managed. Consequently, this notion is particularly applicable for understanding the complexity of cultural heritage in the South Asian context. Four papers in this panel will explore the use of this construct in framing the plurality of cultural heritage in South Asia and in guiding its planning and management. Neha Rajora and Amita Sinha present a conservation plan that would reclaim and reinterpret the cultural landscape of Amber Fort Complex in Jaipur, India, in which a ‘heritage walk’ physically and metaphorically connects diverse landscape features constructing a holistic picture. Neel Kamal Chapagain examines the limitations of cultural heritage conservation ideologies carried out in the Upper Mustang region of Nepal and explores whether the notion of cultural landscape could have broadened up the ways the heritage of the region were perceived. Ana Valderrama and Amita Sinha outline the cultural landscape approach to conservation of the heritage of Orchha, the capital of Bundelas from 1531-1783 CE, in India. Sacred geometries as in archetypal forms of mandala and yantra guided the transformation of wilderness into the inhabited cultural landscape in the 16th century, where the defense requirements of the medieval era were met together with the need to consecrate the site. This lost heritage of Orchha is proposed to be reclaimed through conservation and development of public spaces used by both tourists and pilgrims. Kapila Silva reviews the conservation projects of the Bhaktapur World Heritage site in Nepal and points out that its heritage could be better conserved when the entire town is understood as a microcosmic representation of a larger cultural landscape. As the papers explore the potency of this construct in heritage management, the relevance of their theses extend to other places beyond South Asia.
Materializing Time

Rennie Tang, Cal Poly Pomona, United States, rktang@csupomona.edu

Keywords: phenomenological, quantitative, material, tangible, experience, perception, Duisburg Nord

Materializing Time

The purpose of this study is to illuminate the phenomenological role of time in the design of the built environment through the exploration of time-driven design strategies. Time is a dimension that can be experienced, indexed, marked and measured through design but is not something that can be physically manipulated or altered. Although time does not change, one’s perception of it can. For example, a 10 minute walk may feel longer under uncomfortably hot weather conditions than under more moderate temperatures. This example begs the question, can environmental design play a role in altering our perception of time? Materializing time is a concept that reverses the passive role of time and asserts it as something to be controlled, organized and made tangible, transcending yet amplifying its ephemerality.

The time-driven work of artist Richard Long is expressed through the act of walking. “I have found many ways to measure myself in relation to the landscape. Most of the longer walks I was measuring by days and nights, or sometimes the solar cycle of twenty-four hours.” (Long 308). Richard Long and other artists such as James Turrell, Robert Smithson and Yvonne Rainer explore time in relation to materials, bodies and environmental conditions. Their works often involve bodily actions, durational effects, residue, shifts, patterns, and decay. These artists provide a context for the projects I will present here to demonstrate the concept of materializing time.

The first project is a studio exercise that I developed for an undergraduate landscape architecture course I am teaching at Cal Poly Pomona. It focuses on time in relation to human movement as a method for measuring the landscape. The second is an invited competition proposal that I worked on for a mobile theater that would temporarily occupy vacant lots in the City of Long Beach. Thirdly, I will analyse the project Duisburg Parc Nord by Latz & Partners, a landscape park located in the post-industrial Rhur region of Germany that I recently visited. The park is a place that reveals itself slowly to the visitor as layers of time and space are gradually uncovered through its spatial qualities, vegetation and visual effects.

Materializing time is an important concept because, unlike many urban projects realized today, it posits that time should not be taken for granted as passive, unquestioned and conventionally deployed, but rather given agency as a strategic instrument to invigorate design pedagogy and practice.
Meaning of the Built Environment: Differences and Similarities between Designers and Users

Aliaa Elabd, North Carolina State University, United States, aaelabd@ncsu.edu
Henry Sanoff, North Carolina State University, United States, sanoff@ncsu.edu

Keywords: Perception-Preference-Culture-Designers-Users

This study is positioned to investigate the difference of perception and preference of the built environment between designers (architecture and landscape architecture graduate students) and non-designers (Middle Eastern graduate students). As built environments communicate certain meanings and cues to people in diverse settings (Rapoport, 1990; Sanoff, 1991), these meanings are generated through people’s personalization, and understanding of how environments work. Meaning of the built environment relates to people’s perceptions, and is usually influenced by their socio-economic, socio-cultural, and demographic factors (Rapoport, 1990; Sanoff, 1991).

With the increasing tendency of many American architects and landscape architects to design for the Middle East region, there is an emerging need for those designers to understand how cultural and educational experience of the users influence their choices, preferences, and meanings of their built environment. There is a need to understand the similarities and differences between the designers’ and users’ perception and preferences, especially when they are coming from different cultures and backgrounds. This will help obtain better designs that meet people’s needs, aspirations and requirements, and are integral to healthy environments.

This study explored the difference of perception and preference between designers and non-designers, utilizing image surveys. The subjects assessed various housing and open spaces alternatives through ranking the images based on their preferences and perception of other criteria such as safety, privacy, distinctiveness, and complexity. Subjects also explained their reasons for their first preference. Designers’ perception was more conceptual and abstract addressing the form, and shape of the objects, while the non-designers group was more interested in associating meanings to the objects, such as beautiful, amazing, nice, unique, etc.
Migratory Infrastructure

Brett Milligan, University of California, Davis, United States, freeassociationdesign@gmail.com

Keywords: landscape change, infrastructure, migration, dam removal, resilience, adaptive management, reclamation, restoration, climate change

Migration is typically used to describe the physical movement of things. Thus studies of migratory patterns tend to emphasize the physical movements of birds, fish, humans, data and other things. As embodied movement through time, migration is an adaptive process of traversing landscapes in the quest for resources.

Repurposing this definition, the intent of this essay is to examine the migration patterns of landscapes themselves. Landscapes are also bodies that move through time. As elastic mediums, landscapes migrate when influential processes and relations of materials that structure them - their infrastructure - are rearticulated by humans and other agents. By examining the migrations of landscapes via the alteration of their infrastructure, the reciprocal side of migration comes to the fore, revealing our contingent agency within changing landscapes.

The landscapes used to illustrate this presentation will be sites of large-scale water engineering projects in the states of Oregon and California. Pivotal transformations of these landscapes, both historical and contemporary, will be presented through maps, models and diagrams. Project examples will include the chaordic redistribution of twenty four million cubic yards of sediment released from decommissioned hydroelectric reservoirs, the re-exposure of thousands of acres of riparian and upland environments formerly submerged behind such infrastructure, extreme translocations of environmental phosphorous and expansive landscape mosaics that have been choreographed to cycle from wetlands to crops and back again.

During these deliberate acts of transformation, the trajectory along which a landscape has been guided or coerced makes an abrupt shift due to a reformatting of its water infrastructure. At such times assemblies of materials begin to migrate along novel and quasi-designed trajectories of redevelopment.

Similar to resiliency science and contemporary ecological theory, migratory infrastructure supersedes landscape ecology models that privilege stability, concepts of evolutionary optimization and static plan views of landscape structure. Migratory infrastructure provides a critical lens with which to view the multiplicities of a landscape through time, as they have been redesigned and then redesigned again as something that functions similarly to what it initially was, but which is inherently different from having traversed those migratory pathways. Migratory Infrastructure serves to clarify practices and nomenclature of landscape restoration, reclamation and adaptive management at a time when we endeavor to re-engineer water infrastructure at a massive scale, all the while navigating through the realization that all landscape infrastructure, from assemblies of vegetation to hydrological cycles, are now migrating due to climate change.
Mosaic Modernity: The Public Park in 20th Century China

Mary Padua, University of Florida, United States, marygpadua@yahoo.com

Keywords: Modern China, history, criticism, design inquiry

Scholarly work on the evolution of the public park and their spatial forms in modern China has yet to be written. This paper represents preliminary work that intends to close this literature gap, particularly in light of the fact that China expects an increase of 400 cities or a population growth of .5 billion by 2020 (Mars 2008). It reveals the 20th century development of this universal landscape architecture prototype -- the period of China's modernity. This paper is essentially a qualitative research project in theory-building, history and design inquiry and ‘located’ within an intellectual, critical and interpretative approach that emphasizes spatial form (Weilacher 2007; Thompson 2002).

It posits the nexus between China’s 20th century development of the public park with its nation-building (modernity) efforts. I argue that four critical, discrete and sometimes overlapping strands of transformation were central to the emergence and unique evolution of the public park. This paper explores the spatial forms of urban parks represented in four temporal strands of transformation: colonial modernity (1842 – 1937); Republican modernity (1912-49); Mao’s modernity (1949-1976); and hybrid modernity (1982 to 2000).

The very low incidence of literature on the historical development of China’s public parks necessitated the review of scholarly work on 20th century China in the arts and architecture, urban history and socio-cultural development (Lu 2006; Minglu 2011).

The paper concludes with some speculation on the role and meaning of the public park over the 20th century and into the 21st century, particularly with central government's expectations to add an additional 400 cities by 2020. As the first historical documentation and critical analysis of the public park in modern China, this work is preliminary, yet breaks new ground. It sets the foundation for future research, creating a bridge between the literature in China and the West and contributes to closing the gap in the literature on the history of China’s modern landscape architecture.
Natural Elements and the Embodiment of Time in Place in Iranian Traditional Architecture and Landscape Architecture: from Chahār-Soffeh to Chahār-Bāgh

Nastaran Tebyanian, Shahid Beheshti University, Iran, nastaran.tebyanian@gmail.com
Memar Maziar, Shiraz University, Iran, maziar.memar@gmail.com

Keywords: Traditional landscape Architecture, Vernacular Residential Architecture, Persian Garden, Iran, Time, Interior Landscape

Man has often aspired to overcome time and become eternal. An illustration of these efforts in architecture was through the embodiment of time in place to make the place timeless. In this way, a major tradition was reproducing the perceived geometry of the cosmos and making the recreated place an image of the world or paradise, the heavenly garden. This materialization of time in place is also seen in the tradition of Iranian Architecture in various scales, from small houses to pavilions, gardens and cities. A delicate way in the effort to reach timelessness was ironically implementing the ephemeral natural elements of light, water and plant.

This paper studies how these natural elements are employed to yield the yearned timeless place. It focuses on two distinct but similar, characteristic types of Iranian architecture; a certain old and fundamental but less-studied pattern of residential architecture called Chahār-Soffeh (literally four-vault) and the noted Chahār-Bāgh (literally four-garden) pattern of Persian Gardens. The Chahār-Soffeh pattern, designed on a cross-in-square has a small central space commonly encompassing plants (a sacred evergreen tree, symbolizing cosmic tree) or water together with light, depict the Axis Mundi. Likewise, Chahār-Bāgh divided by paths or waterways into four symmetrical sections represents the paradise where existence is timeless. In both cases as the geometry materializes the cosmos and time, natural elements harmoniously complete and emphasize the same symbolism; renewing the time and uniting time and place.

This research by an extensive field study, continued by surveying historical texts and poems and cross-cultural studies deciphers the symbolism of these patterns and analyzes the mechanisms of applying natural elements. The outcome having both theoretical and practical aspects depicts the cohesion between architecture and landscape in multiple scales and how natural elements can be utilized to affect the concept of time in both interior and outdoor landscapes.
Novel Landscapes: Urban Transitions and River Transformations

Ken Yocom, University of Washington, United States, kyocom@uw.edu
Kuei-Hsien Liao, National University of Singapore, Singapore, akilk@nus.edu.sg

Keywords: novel landscapes, urban, river

Today, one would be hard pressed to find anywhere on the planet that has not been impacted by human actions (Sanderson et al. 2002). In recent years, the concept of novelty has emerged in the ecological sciences to describe the biophysical transformations that have occurred to many ecosystems in response to these impacts (Williams and Jackson 2007). Novel ecosystems are described as having unique combinations and a relative abundance of species in areas that have never been seen before. These shifts have the potential to alter the functional capacity of ecosystems. Additionally, a primary variable of this novelty characterization is that these places are a “result of deliberate or inadvertent human action (Hobbs et al. 2006: p1).” Extending this characterization to landscapes, the contextually-grounded places where ecosystems function and interact, enables the development of a more place-based approach for assessing novelty through a temporally-oriented, functional, and spatial context.

Recognizing the importance for land managers and designers to comprehend the condition of novel characteristics (whether subjectively good or bad) in a landscape, this presentation will provide an overview and conceptual framing of the novel landscape concept. The concept will be further explored through two riverine case studies. As rivers are characteristic of the landscapes they drain, they can contain ideal conditions for comprehending alterations to the historical trajectories of biophysical processes (Allan 2004).

The two river systems examined are the Green River in King County, Washington and the Elwha River on the Olympic Peninsula also in Washington. With a heavily urbanizing floodplain, altered hydrology, and manipulated channel, the Green River offers the opportunity to assess the concept of novel landscapes through an urban lens. In contrast, 80% of the Elwha River watershed is located in the Olympic National Park. Historically the river was arguably one of the most biologically productive systems in the Puget Sound region supporting healthy populations of all five species of regionally endemic anadromous salmon. Two dams, constructed in the early 20th century, are in the process of being removed and the hydrological and physical processes of the watershed are being restored. In this scenario the Elwha River represents a system and landscape transitioning into a different development phase along an urban continuum. Comparing the cases, the presentation concludes with the perceived limitations of this concept and the potential implications to design and management strategies and future scenario development.
Paradise in Conflict: Reexamining and Safeguarding the Genius of the Mughal Gardens of Kashmir

Jan Haenraets, Pai Chai University, Korea, Republic Of, jhaenraets@gmail.com
Alyssa Schwann, University of Manitoba, Canada, Alyssa.Schwann@ad.umanitoba.ca
Melissa Hollingsworth, Hamilton Anderson Association, United States, hollingsworthmelissa@hotmail.com

Keywords: Mughal, Kashmir, preservation, landscape history, landscape planning, training, UNESCO World Heritage

The Mughal Emperors' passion for garden making in Kashmir was closely linked to the sheer beauty of the place along with its potential to be exploited for their favourite hobby. The gardens and their wider cultural landscapes were a manipulation of the natural process, whereby the beauty of the place was captured and further sculpted, often by enclosing and terracing the landscapes, by lush plantings, and through the ingenious aesthetic and functional use of the abundant Himalayan water sources. By deliberately speeding and slowing down the natural processes, in combination with the implementation of the Islamic chahar bagh and Paradise Garden concepts onto the topography of Kashmir, this resulted in a highpoint of garden history.

Nevertheless, this heritage remains under-examined and at risk, with Nishat Bagh and Shalimar Bagh being included in the 2008 World Monument Fund List of 100 Most Endangered Sites of 2008. The paper will set out how the traditional manipulation of the natural environment is being undermined and what is done to address this. The methodology of the study followed international conservation principles and for instance included literature reviews, archival research, and on-site surveys of architectural structures, planting schemes, topography and water systems. A landscape character assessment and buffer zone analysis was undertaken to study the condition of the wider setting.

Outcomes identified threats of urbanization and inappropriate development, while the mountainous and lakeside settings are experiencing devastating environmental pressures. Inadequate preservation and horticultural expertise demands for a review, with a Mughal Gardens Conservancy and a skills training program being recommended. Capacity building, community engagement and education are essential within the context of the conflict-ridden Kashmiri society. The complexities of convincing the political echelons of the sites’ significance will be highlighted together with the campaigns to strengthen legislation. A success has been the serial nomination of the gardens on the UNESCO World Heritage Tentative List, with the project now supporting the preparation of a full nomination dossier. Conceptual ideas for the development of world-class visitor and interpretative facilities, buffer zones and countryside parks will be illustrated.

The purpose of the paper is to highlight the methodology and progress of the ongoing study and projects to support the safeguarding of the Seventeenth Century Mughal gardens of Kashmir. The projected outcome of the study and projects may contribute to the ongoing knowledge base about these sensitive and sophisticated heritage sites, while proposing long-term strategies for sustained investments.
Remnants and Remembrance of WW II Japanese American Confinement Sites in the American West

Shelley Cannady, University of Georgia, United States, scannady@uga.edu

Keywords: Japanese American Confinement Sites, Relocation Centers

During WW II, Japanese Americans in the western U.S. were confined in concentration camps that were officially called ‘War Relocation Centers.’ These camps were decommissioned over six decades ago and to the untrained eye little remains in the landscape to tell their story. They are now sites of remembrance and pilgrimage but their meager acknowledgement in the landscape is not commensurate with their historical importance.

The Tule Lake Segregation Center was one of ten such Relocation Centers. Its remaining presence is greater than the others; many of its features remain in situ and many of its buildings were repurposed in the local area after the war. But given the presence of so many intact historical assets and the fact that it was the largest, longest operating, and most controversial of the camps, it is ironic that its level of interpretation as a historic site is minimal compared with some of its sister sites. This research seeks to compare the differences in the physical presence and on-site acknowledgement of these confinement sites by examining visual cues to their former existence (signage and memorials), current interpretative infrastructure, the ease of access and wayfinding to the site, and physical remains on site and in the surrounding communities.

Research methods include visual inventories and photographic documentation of six of the ten former confinement sites and their surrounding contexts: Tule Lake and Manzanar in California; Poston and Gila River in Arizona; Topaz, Utah; and Minidoka, Idaho. Information also comes from communication with National Park Service personnel engaged in management and planning for former confinement sites and with people in the local communities surrounding these sites. The author has also had decades of personal interaction with the Tule Lake site and has participated in a recent pilgrimage event to it in July, 2012.

Findings expose a wide range in historical interpretation and memorialization ranging from the sophisticated museum and interpretive signage at Manzanar to no visual acknowledgement whatsoever at Gila River. Some sites have poor on-site interpretation or acknowledgement but have off-site memorials and/or visitor centers and museum displays. Site access and ease of wayfinding also varies; most are accessible but remote, though access to Gila River is restricted. The number of buildings remaining either on site or dispersed locally is also mixed, with the most noticeable remaining presence in the Tule Lake and Poston areas.
Rohwer Memorial Cemetery: A Story of Hope and a Desire for Permanence

Kimball Erdman, University of Arkansas, United States, kerdman@uark.edu

Keywords: Japanese American Relocation Center, internment, cemetery, history, culture, historic preservation

On October 16, 1942 Mrs. Fumio Masaki gave birth to the first baby born at the Rohwer Relocation Center in southeast Arkansas. Unfortunately, the infant lived only a few hours, thus also earning the distinction of being the first internee to die at the camp. In the haste to design and build the “relocation center” that would eventually confine over 8,000 west coast residents with Japanese ancestry, the need for a cemetery had been overlooked. A small plot was cleared and a grave was dug by internees immediately south of the camp’s barbed wire perimeter. More graves would follow, although cremation was the dominant cultural preference; by the time the camp closed in November 1945, 168 deceased internees had been memorialized in the cemetery with 24 headstones and two large monuments.

Though initially an afterthought, today the cemetery is Rohwer’s only intact remnant of this difficult chapter of American history. Designed and built entirely by internees using found and inexpensive, everyday materials, the cemetery symbolizes hope and a desire for permanence by a people torn between, and yet trying to unite, two cultures at war. Despite the internees’ plea inscribed on one of the monuments, “May the people of Arkansas keep in beauty and reverence forever this ground where our bodies sleep,” the cemetery fell victim to vandalism and neglect after the center closed. By 1960 interest in the site was renewed by former internees and camp officials who initiated the first of many attempts to protect and recognize the cemetery. Gradual degradation continued, however, with the site garnering public attention only when occasional events such as reunions of former internees were held.

As the generation of Japanese Americans interned in relocation centers began to disappear, efforts to recognize and remember their experience increased. In 1992 the cemetery was designated a National Historic Landmark, but the remote location, private ownership, and well-intentioned but underfunded restoration efforts have all continued to pose serious challenges to the cemetery. In the past three years, however, the former camp has benefited from several large federal grants, including one to conserve the cemetery monuments. This paper summarizes recent research and documentation efforts that were part of a historic landscape preservation class project that greatly expanded understanding of the historic character, creation, and subsequent evolution of the cemetery and laid the necessary groundwork for the preservation efforts.
Sites of the Post-Apocalyptic Western: Landscape Architecture and the Moving Image

Susan Cathleen Gunn, University of Colorado, United States, susan.gunn@colorado.edu

Keywords: cinema, representation, invisible landscapes

In the era preceding the benchmark year of 2012 images of a post-apocalyptic future have been ubiquitous in the cinema, a trend noted by scholars, authors, and popular journalism. Many of these films appear structured around what I refer to as the Post-Apocalyptic Western, indicated by a formulaic plot structure, iconic desert landscapes, itinerant movement, a tabula rasa ideology, the dream of the garden, and other conventions of the Western genre. The Western and its contemporary descendant, the road film, rely on the landscape to relay a message. Thus, landscape and genre are inextricably linked. The widespread popularity of the Western provides a window to the cinema’s role in cultural production as well as the global diaspora of American values of landscape. Literally and mythically, the American landscape of the Apocalypse has become the World Landscape.

Numerous scholars in other disciplines have forwarded the study of the cinema as a hermeneutic and pedagogical resource. Yet, despite its potential to represent and engage design interventions, the medium of film and video has been relatively underutilized in the field of landscape architecture (Helphand 1985, 1). I suggest that the human experience of landscape, the design of sites, and the discourses surrounding place are profoundly informed by images proffered through moving pictures as the cinema has been involved with the construction of place and meaning since its inception (Uricchio 1988, 17). However, perhaps because of the enormous amount of energy devoted to industrialization and urbanization, the relationship between cinematic and spatial practices has historically focused on the city. Thus, despite the significance of pastoral places in the national imagination, only recently have publications been devoted to the rural landscapes of the cinema (Lefebvre 2006, xx). A critical investigation into the nature of this affiliation will provide insights into the dialogues around space, place and site that are at the center of the landscape architecture discourse. Contextualizing the cinema as a gnostic tool to reveal relationships between humans and landscape that had previously been hidden or repressed, (Balazs 2011), this presentation will review five key films - Planet of the Apes, 1968; Dead Man, 1995; I Am Legend, 2007; The Road, 2009; The Book of Eli, 2010 - to explicate the role of contested space symbolized as the mythical frontier and its association with cultural amnesia and invisible landscapes as palimpsests of trauma and perpetual war in the American psyche.
Space and Culture Under the Cherry Trees

Ron Henderson, Pennsylvania State University, United States, reh29@psu.edu

Keywords: cherry blossom, sakura, o’hanami, Japanese garden, Ryoan-ji, Sento Gosho, Ritsurin, Koraku-en, Kenroku-en, hanafubuki

Falling sakura (cherry) blossoms litter the gardens of Japan.

In stroll gardens such as Ritsurin in Takamatsu, Kenroku-en in Kanazawa, and Koraku-en in Okayama, cherry trees are carefully sited on sloped banks, along streams, at bridge crossings, and other situations that present their attributes advantageously.

At the Imperial Palace of Kyoto, a single sakura is located just outside the Palace - to the left of the seated position of the Emperor - and matched on the other side (the Emperor’s right) with a tachibana, or evergreen orange tree. This pair of specimen trees represent both the fleeting nature of life (the cherry) and the longevity of imperial lineage (the tachibana).

The branches of a shidare-zakura, or waterfall cherry, overhang the rammed earth wall and cascade into the garden at Ryoan-ji. In the summer, autumn, and winter, these branches are discreet - the renowned array of stones in the garden are the focus of contemplation. However, in the spring, the dark pink blossoms of the sakura hang down over the wall and sway in the breeze to animate the space of inert stones. Late in the bloom season, strong winds scatter the petals of sakura in a flower storm, or hanafubuki. The petals swirl in the currents of wind and fall to the ground - disappearing as if melting into the white gravel of the garden. As Ohnuki-Tierney reminds us however, in "Kamikaze, Cherry Blossoms, and Nationalisms", the falling blossoms embody military, economic, and aesthetic meanings that challenge their beauty. After all, the kamikaze squadrons were named after cherry blossoms.

No flower falls to earth as beautifully as the petals of the sakura.

The paper investigates the placement and planting design of Japanese sakura, or cherry trees, in representative parks, imperial gardens, and monastic gardens where the presence of the blossoms is amplified by topography, path alignments, planting composition, and other design strategies. The paper draws from the author’s National Endowment for the Arts / U.S.-Japan Friendship Commission 2012 Creative Artist Grant in Japan - as the first landscape architect to receive this grant since its inception in 1978 - and is augmented by drawings of gardens from fifteen orihon (folding) sketchbooks completed during this recent research.
Space, Form, and Art: A Landscape Architect’s Framework for Public Art

Katie Kingery-Page, Kansas State University, United States, kkp@ksu.edu
Lorn Clement, Kansas State University, United States, lacjr@ksu.edu
Lindsay Smith, Beach Museum of Art, United States, lsmith@ksu.edu

Keywords: art, public art, public space, art in landscape

Whether or not landscape architects wish to pursue practice as artists, the intersection of public art and public space demands they be able to function as designers of landscapes for art. While landscape architects’ training in spatial design provides a foundation for considering public art, landscape architects need additional knowledge of art theory. James Wines coined the phrase “turd in the plaza” to express sculpture inappropriately conceived and sited in relationship to its context (Hall 1999, 250). Wines levied criticism against architects and artists, but landscape architects share the blame for poorly sited public art.

To improve the landscape architect’s ability to facilitate public art, this paper presents a framework for considering sculpture and site. Spatial form influences human experience of the world (Lynch 1961, Hillier 1996, Bosselman 1998, Thwaites and Simkin 2007) and is thus critical to the site-sculpture framework. The framework is synthesized from formal, gestalt theories of form and space (Ching 1996, Lynch 1960). The formal, gestalt approach is concerned with “principles of composition,” “elements of design,” and the duality of “order and disorder” (Lang 1987, 188-189). The site-sculpture framework also synthesizes twentieth-century art theories of site and sculpture (Irwin 1985, Hall 1999).

This study uses an embedded case study methodology, applied to three different sculptures and respective sites on a university campus, to test the site-sculpture framework. Embedded case study design breaks the phenomena to be studied (here, art in the landscape) down into process units to facilitate data collection (Yin 1994). In this study, the process units are scales of observation: the overall campus scale, the site scale, and the intimate scale of the sculpture itself. Each case study includes formal analysis, archival research, and phenomenological description of ephemeral qualities. The case studies answer:

1) What factors of site and sculpture are most crucial to legibility and imageability of the sculptures and their respective sites? Analysis of each case indicates that spatial enclosure, figure-ground relationships, and scale relationships are critical factors in siting art. Additionally, archival research reveals that the presence of a strong, visionary administrator for the art collection correlates to legible, imageable siting of art.

2) How can the landscape architect apply existing knowledge to the design of settings for art? Landscape architects conduct site analysis as a matter of practice. The site-sculpture framework (adjusted in light of case study results) can guide site analysis for the purpose of siting art.
Speed, Experience and the Aesthetics of Modernity in the Mid-Century American Landscape

Jeffrey Blankenship, Hobart and William Smith Colleges, United States, blankenship@hws.edu

Keywords: Speed, experience, aesthetics, modernity, mid-century America

Speed, Experience and the Aesthetics of Modernity in the Mid-Century American Landscape

The Italian Futurists of the early 20th century were part of a generation of artists, designers, filmmakers and writers who sought to articulate and represent the increasing motion and speed of modernity. With the 19th century in living memory for many of them, these artists embraced—even celebrated—the temporal and existential experience of 20th century modernity’s accelerating pace. Their philosophy was embodied in Marinetti’s “Manifesto of Futurism” when he stated, “We declare that the splendor of the world has been enriched by a new beauty: the beauty of speed.” Almost 50 years later J.B. Jackson—in one of his most iconic essays, “The Abstract World of the Hot-Rodder” (1957)—brought his critical eye to how mobility and speed were transforming the way Americans experienced the everyday landscape. “Certainly no more pretty parks or carefully preserved rural landscapes or classical perspectives.”

Jackson articulated how everyday Americans were finding little satisfaction in the quiet contemplation of picturesque and natural scenery and were instead seeking out dynamic new forms of adventure and recreational activities that propelled them through the landscape, often at great speed. In Jackson’s “abstract world” of sensation and visceral pleasure the hot-rodder supplanted the flâneur; the kinetic experience of space challenged the slow contemplation of place. In retrospect, Jackson articulated the transformation of local place into abstract space that we now recognize as characteristic of 20th century modernity’s landscapes, however he tied that transformation to the changing desires and experiences of everyday people.

Literary scholar Enda Duffy, in his recent The Speed Handbook: Velocity, Pleasure, Modernism (2009), builds on Aldous Huxley’s claim that the only new pleasure invented by modernity was speed. Duffy argues for the existence of an “adrenaline aesthetic” that was accessible to everyday people regardless of class. This paper draws on both Jackson’s 1950’s essay and Duffy’s recent development of “speed theory” to glean new insights into the conceptual relationship between speed, experience and aesthetics in mid-century landscapes. This paper will examine some of these adrenaline landscapes—drag strips, speedways, ski slopes, watercourses, theme parks, airfields and other venues that supported the expanding recreational options available by mid-century—as the most accessible and direct experience of modernity available to everyday people. Ultimately this paper proposes a new critical aesthetic framework, beyond that of scenic preference, for explaining how modernity was experienced in the mid-century American landscape.
Sustainability Before the Word: Environmental Pragmatism from 1880-1940 in the US Patent Archive

Richard Hindle, University of Illinois, United States, r lhindle@illinois.edu

Keywords: Patents, Ecological Urbanism, Sustainability, Modernism, Pre-War, Innovation, Technology

Before environmental awareness and notions of sustainability, environmental pragmatism guided technological innovation in the built environment. The US Patent Archive chronicles these developments, revealing that cornerstones of sustainable site and building practices such as the permeable paver, engineered green roof substrates, geo-textile, geo-grid, and the vertical garden, emerged during the late 19th and early 20th century as a pragmatic response to questions of environmental design, not from broader theories of ecological awareness. This presentation discusses these early environmental patents, and their historical context, to develop an understanding of technological innovation before the term “sustainability” existed in common language. Patents discussed will include: US Patent 2,113,523 Vegetation-Bearing Architectonic Structure and System (1938), US Patent 1,905,176 Method of and Means for Preparing Lawns (1932), US Patent 342,595 Roof Garden (1886), US patent 2,215,159 Landscape Pavement (1938). These patents, and others, establish important precedents for emergent technologies today and challenge us to reflect on the history and theory of ecological and landscape urbanisms, not as new or emergent theories evolving from the environmental awareness of the mid 20th century, but as a technological continuum defined by innovation and pragmatism in the face of environmental imperatives.
The Built Vestiges of Host Cities of Multiple Mega-Events

Kris Fox, University of British Columbia, Canada, kfox@sala.ubc.ca

Keywords: Mega-events, physical history, built vestiges, comparative mapping

The goal of this paper is to examine the built vestiges, such as transportation networks or stadiums, of cities that have hosted multiple mega-events. This paper asks what are the cumulative built legacies of these mega-events upon a single host city and what influences did the multiple events have upon each other? Several cities, such as Vancouver, British Columbia, (2010 Winter Olympics, Expo ‘86), London (three Olympics, five Expos), and Mexico City (1968 Olympics, two World Cups, two Pan American Games) have hosted multiple mega-events. This multiple hosting of mega-events may be attributed to the massive financial commitments of a city (and nation). Few cities have the ability to compete in this forum, resulting in a scenario whereby certain cities end up hosting mega-events on multiple occasions (Gold, 2005).

Mega-events are defined as major cultural or sports spectacles such as World Fairs (Expos), Olympics, World Cups, etc. (Roche, 2000). The current writings on mega-events has been done primarily through the lens of historians and cultural geographers, who emphasize historical, cultural / social and economic impacts. Their studies also tend to focus on a singular event (i.e. Expo 67) or type of event (i.e. the Olympics). My approach, which documents the physical impacts and changes made to a single host city that has hosted multiple types of mega-events, has not been studied through the lens of landscape architecture, making it relevant to what we do.

This paper will compare the host cities of mega-events through maps (GIS and historical), diagrams and inventories of built elements. The first part will compare the physical impacts of the mega-events in the individual cities. The second part will compare the spatial data and trends of cities that have hosted multiple mega-event to each other. The final part will compare inventories of the built vestiges from the respective mega-events in each city – the architecture, landscape architecture and infrastructure. In order to reveal the fate of these built elements that comprised the grounds of the mega-event, typologies of the different building strategies will be established such as permanent, phased, temporary or relocated. This will allow the study to reveal in greater detail the physical impacts, successes and failures as they occurred over time. The findings may also inform development strategies of cities that have previously hosted mega-events, but don’t want to invest in further infrastructure, or similarly sized cities hosting events for the first time.
The New Topographics: Radical Shifts in Landscape Thinking and Valuation in the 1970’s

Anne Godfrey, University of Oregon, United States, godfreya@uoregon.edu

Keywords: photography, landscape perception, environmental policy, New Topographic Movement, Robert Adams, Ansel Adams

The New Topographic movement in photography (1970’s) reflects the marked shift towards rational and objective thinking about landscape and ecology. At this time Ian McHarg’s Design with Nature is published (1969) and new federal policy on the environment reflects the social accumulation of concern over the negative effects of technological advancements during the mid century, as outlined in Rachel Carson’s Silent Spring (1962) and illustrated by the Love Canal disaster (1959-1978). The cool, vernacular, mundane, yet examined and analyzed subject matter of the New Topographic Movement’s photography illustrates a turn away from both the transcendental and romantic values that formed the basis for the early conservation and preservation movements in the United States.

The New Topographic movement came on the scene in 1975 with the pivotal show New Topographics: Photographs of a Man-altered Landscape at the George Eastman House in Rochester, New York. The core group of photographers: Robert Adams, Lewis Baltz, Joe Deal, et al, sought to portray the contemporary landscape situation through “understanding the things we photograph in their largest relationship to land and culture and the particularities of social existence” (Golke 1979). Each of the photographers examines the margin between “nature” and “culture” as many of their subjects portray the expansion of the suburbs, human outposts in the desert, and degradation of the landscape through human practices. Both the subject matter and style of these photographs is a direct antithesis to the majestic photographs of Ansel Adams, Edward Weston and their contemporaries from the early and mid 20th century. Adams and Weston typify both romantic and transcendental views of landscape while Robert Adams, Deal and the rest of the New Topographic Photographers state they reflect an objective and rational view of the landscape in hopes of revealing the impact of humans on the landscape.

This paper will examine the following: the use of photography as primary documents to illustrate a social shift of thinking and valuation of landscape; compare and contrast the motivations, landscape values and points of view of the New Topographic photographers with those of Adams, Weston, Eliot Porter and others; reveal how this time period (1970’s) marks a clear shift in thinking about the landscape from a more romantic and transcendental view to a more rational and concerned view; situate this examination within the social and political context of the time of the New Topographic show.
The Presence of Place and Time in Landscape Photography

Kathleen Kambic, University of Colorado Boulder, United States, kathleen.kambic@colorado.edu

Keywords: photography, culture, perception, design perspectives

Landscape photography has manipulated and informed the national discourse on the meaning of landscape and its value to society. In the vein of JB Jackson’s definition of landscape as “a portion of the earth’s surface that can be comprehended at a glance” , it can be argued that the landscape photograph most specifically calls to mind the idea that landscapes are finite and readable. (Jackson 8) Diane Arbus once said,“ ...what it’s of is always more important than what it is.” (Arbus) This cuts to the heart of the nature of photography. The fact that the image is captured and controlled gives us the chance to react thoughtfully to what we see. The photograph is a place of work, a structured and structuring space within which the reader deploys, and is deployed by, what codes he or she is familiar with in order to make sense” [sic] (Burgin 137). If we look at the ways photography has been a venue for understanding landscape sites over time, we can understand not only the ways photographers conceive each image but also the embedded meanings of the thing pictured. This essay examines (industrial) landscape photography and how it developed out of specific cultural understandings of the American landscape that evolved over time from an optimistic sense of inhabitation to an ironic understanding of uninhabitable places.

Through a discussion of works spanning the last 175 years of photographic production, this paper will explore the different themes photographers have promoted, the effects of images on public perception of landscapes, and shifting attitudes toward landscapes within the discipline of landscape architecture. First, the construction of a photographic image is discussed as a specific form of art to describe landscape spaces and places. Second, this paper will explore how the modified environment [disturbed nature] becomes evident in the landscape photographs of different time periods. Third, the implications of photographs on seeing/designing landscapes are surmised. Through the study of landscape photography, we can continue to develop a more sophisticated understanding of contemporary perspectives on landscape from inside and outside the discipline, providing valuable perspective on our efficacy in the world.
The Relationship Between a Plant’s Traits, a Plant’s Taste and Function, and Feng Shui

Yi-Ting Lin, National Taiwan University, Taiwan, yiting1255@gmail.com
Chun-Yen Chang, National Taiwan University, Taiwan, cycmail@ntu.edu.tw

Keywords: plant’s traits, plant’s taste and function, Bencao Gangmu, Feng Shui

In Chinese culture, we believe that the environment in which we engage can have an effect on us that we call Feng Shui. A place with ideal Feng Shui requires several elements in the right place and form. For one good example is the Forbidden City, it is based thoroughly on Feng Shui, from the choice of the location, layout, to the details. Nowadays, Eastern architecture has been greatly influenced by the Western concept of design. Such as the famous Chinese American architect I. M. Pei, built the Bank of China Town in Hong Kong, regardless of Feng Shui, causes surrounding companies to worry about the bad Feng Shui effect that the sharp angles of the building brings. We can see from this peculiar case, that the concept of Feng Shui is profoundly planted in the mind of the Asians.

When the Feng Shui of a place is not optimal, placing plants at certain places as needed is a common way to fix it. But how to choose the proper plant is the next question. So far, there are hardly any studies that particularly discuss vegetation from the perspective of Feng Shui. When selecting plants, Feng Shui masters do look to ancient books such as Bencao Gangmu for reference. In Bencao Gangmu, it records each plant’s taste and function, which describes the flavor and its effect on human body upon consumption. But in the field of landscape architecture, we choose plants based on their appearance, which effects us through sight. Moreover, when plants are combined together, they have an effect on our environment, which is the Feng Shui effect.

A plant’s traits, its taste and function, and Feng Shui can all influence us in some way; therefore, in this study, we will discuss the relationship between these three factors. Plant’s traits and plant’s taste and function had been recorded, and certain tendency can be observed. More salient results are expectable after expanding of the sample size. Qualitative interviews are being made with Feng Shui masters, in order to capture the decisive factors that may affect a plant’s Feng Shui characteristics. Further objective is to develop a quantitative questionnaire on the Feng Shui characteristic of plants. If all three of these aspects correlate, that would be helpful for landscape architects in predicting a plant’s Feng Shui characteristics, and thus Feng Shui could be more easily applied to our environment.
The era when the Ottoman have emphasized on the palaces and their gardens, is the “Tulip Era” that Western effect has been felt on Turkish gardens. This era that is a beginning point of declining from both administrative and political point of view, despite its relatively short longevity is considered as important from fine arts and landscaping aspects. By primarily Ahmed the third (Ahmed III) firstly, numerous sea-fronted palaces, palaces, manor houses, sea-side residences and their gardens and woods that have been constructed by the statesmen and rich people, where starting at Kagithane valley all the way to Golden Horn and Bosphorus water-fronts as sparse manner have caused Istanbul to transform a "city of garden and water". In Europe, while the Renaissance and Baroque style gardening fashion leaves their place to British naturalistic gardens, the Turkish Garden have been enchanted by the beauty and magnificence of Baroque fashion.

The most characteristic art works of this era have been Topkapi Palace Gardens and Skutari (Üsküdar) Palaces Gardens. Being influenced by the effects of Europe, the Ottoman Architecture has been indirectly due to an attempt that begins with the visit of Mehmet Çelebi the 28th to France within the years of 1720-1721. At this era, beside the poetry and music, even at gardening arts have become considerable improvements, the palace’s authorities have started to built palaces, manor houses sea-front residences where it has a dominating scenery at Istanbul and started a pompous life. Amongst them, the Çiragan Palace at Besiktas and Sadabat Palace at the Kagithane valley and Three Hundred Kiosk have been considered as the prominent examples of this era. At the Tulip Era Architecture the “formats” that are directly transformed from the West have not been dominant however; some novelties that occurred together with the Tulip Era only and that could be comprehended by means of a general design tendency have been realized. Opening up to west at Tulip Era has also caused to appear similar ornamentations at Turkish gardens. In 1720’s, through the attempts of French Consulate some garden organizers have been brought from that country. 19. At the beginning of 19th Century, Melling who has worked as the architecture of Hatice Sultan, the daughter of Selim the Third, by simulating her palace garden at Besiktas, has been organized thee with geometrical pathways and flower beds. Afterwards, this has been an example for many palaces and manor house gardens.
Theory as Groundless—The Specter of Skepticism

Michael King, University of Illinois at Urbana-Champaign, United States, making4@illinois.edu
David Hays, University of Illinois at Urbana-Champaign, United States, dlhays@illinois.edu

Keywords: Theory, Practice, Skepticism, perspectivism, Emerson, Nietzsche, Ortega y Gasset

Landscape architects are familiar with the specter of skepticism—it rears its ugly head at just about every critique. For philosophers, the problem of skepticism is the threat of being unfounded, which amounts to having no foundation or grounds upon which to stand. To be challenged by a skeptic can result in having the rug pulled out from under one’s feet or in the humiliation that arises from slipping on a banana peel. Such indignities are all too familiar for even the most seasoned landscape architects and designers. But the greatest humiliation for landscape architects (and philosophers, depending on who you ask) might be the attempt to theorize the discipline, as if such a gesture will lend the discipline an air of seriousness or importance. Abstracting the discipline of landscape architecture from its everyday habitation into the rarified realm of theory is not only nonsensical, but foolish.

This paper will consider the airiness and aridness of theory, which is contemplation from above or at a distance, for landscape architecture, a discipline rooted in practice and the ground itself. When we design as if we are placeless (atopai—without topography) or without consideration to context, we are called to task (and rightly so). If we theorize the discipline, which entails “looking at the field” from a distance, do we not render landscape architecture itself placeless? (Perhaps safe from slipping on a banana peel, but at what cost?)

We can turn to Continental philosophers such as Jose Ortega y Gasset for a perspective on perspectivism to give ourselves a footing; we can look to Ortega Y Gasset’s primary influence on the matter, Friedrich Nietzsche, who conceived the concept of perspectivism, which entails being grounded in this world and walking the earth in these bodies; finally, we can till more fertile ground in Nietzsche’s own roots—the writings of Ralph Waldo Emerson. Emerson’s “Experience” opens with a question that still animates all landscape architects, even those who do not read him or take him seriously, and offers a grounded theory: “Where do we find ourselves?” The question concerns not merely finding one’s place in the world, which is what landscape architects are entrusted to do, but more importantly, wonders where and how we can even found ourselves, or give ourselves a foundation upon which to stand. In the end, digging in the dirt might be all the theory that is needed.
Toomer’s Oaks: What a Pair of Poisoned Trees Might Tell Us About Ourselves

David Hill, Auburn University, United States, hill@auburn.edu

Keywords: Toomer’s Oaks, Toomer’s Corner, Auburn Alabama

On January 27, 2011, a person who identified himself as Al phoned into the The Paul Finebaum Show, a nationally syndicated sports radio show, and claimed that he had poisoned the two 130+ year old Oak trees at the corner of College Street and Magnolia Avenue at Auburn University, known locally as the Toomer’s Oaks. Located at the epicenter of Auburn’s quaint downtown and acting as a primary entrance to the University, the oaks have been described by Auburn University President Jay Gouge as “the home of countless celebrations and a symbol of the Auburn spirit for generations of Auburn students, fans, alumni and the community.”

It’s not every day that so much attention is placed on plants. While the Oaks have been the scene of a long held tradition to be rolled with toilet paper directly after a significant University sports victory, these trees have also acted more broadly as symbols for a healthy relationship between the city and the University. This paper will examine the role of the Toomer’s Oaks as symbols and will discuss how their collective meaning has evolved over recent years. Once imagined as stable, strong, and firm, recent descriptions of the oaks reveal a more nuanced viewpoint that acknowledges and accounts for the change that occurs through time. The many and varied strategies brought forth by the community to respond to the poisoning of the Oaks reveal a lot of about how we see the world.

In order to discuss the symbolic significance of the oaks, the paper will unpack the events surrounding the poisoning of the oaks, the remediation efforts by the University, the various media stories that resulted from the event, and will finally present a series of future design recommendations that emerged from students in Auburn’s graduate program of Landscape Architecture.
Toward a New Landscape: The Evolution of Modular Form in Ian McHarg's Theory of Design

Kathleen John-Alder, Rutgers, the State University of New Jersey, United States, kjohnalder@gmail.com

Keywords: McHarg, Modular Form, Order, Meaning

This presentation traces the history of modular form in the work of Ian McHarg. The analysis begins with an examination of “The Courthouse Concept” (1957), an early essay by McHarg that argues for a modular system of urban renewal assembled around the court house typology and its self-contained merger of landscape and architecture. Themes from this early exploration are then linked to the rules of organization structuring the environmental urbanism later presented in Design with Nature (1969). Central to this discussion is the close correspondence between McHarg’s intent to transform society through the critical application of an objectively verifiable design language and the intellectual mania for systems of order, which was then permeating the design discourse. Of particular interest is McHarg’s appropriation of images from Module, Proportion, Symmetry, Rhythm (1966) by Gyorgy Kepes, the Director of the Center for Advanced Visual Studies at M.I.T., to support the argument that the multiplicity of forms and patterns that comprise the environment arise from simple modular building blocks interacting with site-specific environmental processes. But perhaps most important, this analysis of the function and meaning of modular form and organization in the work of Ian McHarg challenges the notion that his process driven approach disregarded aesthetics.
Translating “America’s Best Idea”: Charles A. Richey & Post-War Planning of the Japanese National Park System

Heidi Hohmann, Iowa State University, United States, hhohmann@iastate.edu

Keywords: national parks, National Park Service (NPS), Japan, planning

Recently characterized in popular culture as “America’s Best Idea”, the U.S. concept of the national park had a global impact, spawning the development of national park systems worldwide. However, the nature of this influence varied widely, from simple inspiration to organized U.S. technical assistance to foreign governments. This paper documents an early, "official" effort by the National Park Service (NPS) to provide international guidance on national park development in Japan immediately following World War II.

In 1948 the NPS sent Charles Richey, then Assistant Chief of Land and Recreational Planning, to Japan to advise on planning the country’s recovering national park system. Working for the Supreme Commander for Allied Powers under General MacArthur and with the guidance Tsuyoshi Tamura, the so-called "father" of the Japanese national parks in the 1920s and 1930s, Richey produced a series of recommendations for the Japanese system, which included an administrative and management structure as well as suggestions for new reserves.

The paper briefly outlines the history of the Japanese park system from its circa 1870 Meiji Restoration origins to the National Park Act of 1931 and then focuses on the Act’s revision in 1949 and 1957 and post-World War II planning and implementation. Based on archival research of U.S. military and NPS records as well a contemporary comparison of the U.S. and Japanese park systems, this paper demonstrates how American ideology influenced Japanese planning and policy in terms of developing criteria for park designation and organizing a centralizing administration and funding for parks. Perhaps most importantly American influences also helped establish a park management ethic of balancing preservation and public use that has proven as problematic in Japan as it has in the U.S. However, despite similarities between the two park systems, Japanese culture, politics, economics and landscape resources have ensured that some American ideas were “lost in translation,” resulting in uniquely Japanese park planning and management strategies, such as the designation of “quasi-national parks” or the private ownership of national park lands.
Turkish Understanding of Gardens from a Historical Perspective

Bülent Cengiz, Bartin University, Turkey, bulent_cengiz@yahoo.com
Murat Ertugrul Yazgan, Ankara University, Turkey, me-yazgan@hotmail.com
Canan Cengiz, Bartin University, Turkey, canankapuci@yahoo.com

Keywords: landscape history, Turkish garden

This study aims to reveal the main principles of the understanding of Turkish gardening within historical process and to highlight main characteristics of historical Turkish gardening. Turkish garden is not only an excursion spot; it was formed to live in it and feel close to its peaceful existence. In fact, in Turks building was developed after the garden. A spot with beautiful view, clean air and water was picked and most of the time house was built afterwards. In the historical process, culture, which has influenced the formation of all works of fine arts and architecture, has become a basic component of Turkish gardening art. Influenced by various movements from social events to philosophical and religious approaches, the concept of gardening is a concrete cultural component. Gardens of palaces, mansions, and waterside residences echoing from 18th and 19th centuries to today, are structures formed as a result of the effects of several cultures and geographies throughout the history. The understanding of nature in nomadic Turks in Central Asia disappeared within the boundaries of garden. Gardens were planned and built in accordance with the lowlands, rivers, lakes, and mountains that are parts of nature. Considering the fact that, there is a common concept of gardening in Central Asia, it possible to track the features of Turkish gardens in Iranian, Chinese and Indian gardens. According to beliefs of nomadic Turks in Central Asia, sky, mountains, stones, and trees are regarded and blessed as the reflections of the creator on earth. As a result of cultural continuity, this belief has been reflected on Turkish art of gardening in every period, and (it) has been an important element regarding the formation of the gardens. Turks maintained their former beliefs in periods after they had embraced Islam. With the understanding of “heaven” place in Islam, a garden design, which is in harmony with nature and liveable, has emerged as a basic idea. Protecting and considering the characteristics of Turkish gardening with respect to designs of modern green field are of vital importance regarding the sustainability of cultural heritage.
Twelve Prescriptions for an Authentic Vernacular of our “Global Village”

Hyejung Chang, University of New Mexico, United States, hjchang@unm.edu

Keywords: Authenticity, Sense of place, Vernacular landscape, Indigenous environment, Cultural continuity

Studies of indigenous architecture, vernacular landscapes, and regional traditions have confronted the perennial debate on how to negotiate seemingly opposing values: ‘progress’ and ‘tradition’ in theory and practice, oscillating between local identity and global homogenization. Indigenous environments generally are characterized as being regionally diverse yet locally united, and as having an unselfconscious and integrated identity. “The search for absolute authenticity that the doctrine of regionalism implies,” however, often creates no more than an oversimplified picture merely “representing ‘the idea’ of an authentic, regional architecture.”

What does it mean to make an authentic place? How can this value of authenticity be established? The paper seeks to identify the qualities and the properties of an authentic place by exploring units of structural analysis, such as features, forms, and functions, from a number of global and local examples. The argument is premised on an essentially phenomenological and structuralist point of view: 1) Although the geographical surroundings may be widely different, indigenous environments have their own ideological systems (i.e. cultural or a larger symbolic value) in which ‘mental laws’ are manifested in similar ways as an undifferentiated whole (i.e. authenticity); 2) An authentic sense of place takes place anytime and anywhere as a genuine sense of self, which is therefore universal yet at the same time personal.

Four aspects of an authentic vernacular—inhabited, reciprocal, envisioned, and internalized space—are identified as a conceptual framework with the following ‘12 Rs,’ constituting a deeper and perhaps globally shared structure of the vernacular and of the ‘aesthetics of continuity’ in everyday environments. By doing so, the paper aims to establish a number of typological tools for understanding and designing contemporary cultural landscapes.

Inhabited/Livable Space
  Rhythm: ‘musicality’ of repetition, including its variation.
  Repetition: recurrence of the familiar.
  Routine: ordinariness as the ‘ground’ for the ‘figure’ of novelty.

Reciprocal/Communal Space
  Reference: the new that is shared and rooted in the existing.
  Relevance: the unmediated recognition of significance for our existence.
  Relation: the various structures of connectedness.

Envisioned/Legible Space
  Resemblance: the structural similarity of shared features among ‘families’ of things and places.
  Recognition: literally ‘re’-cognition, the pleasure of encountering something again.
  Revelation: uncovering the often hidden essence of something.

Internalized /Empathetic Space
  Remembrance: the presence of the past and of shared values in the new.
  Reverence: a profound respect and appreciation of community and nature.
  Resonance: sympathetic reverberations with our inner being.
Urban Farming and the Reappearance of a Landscape Architectural Tradition

Katherine Crewe, Arizona State University, United States, kcrewe@asu.edu

Keywords: Urban Agriculture; Urban Farming

Urban gardens and urban farms are a growing presence in North American cities. Sometimes referred to as a “middle landscape” between formal and wilderness, this movement for growing fruits and vegetables has spread throughout cities to occupy vacant lots, schoolyards, parks and neighborhoods. Growers have many incentives, chiefly to generate income and employment, but also to alleviate food deserts and experience the earth’s bounty. What is often not acknowledged is that there are distinct types of urban garden today, each with its own ideology, habits of resource consumption, and distinct visual impacts. In Arizona, both dry climate and water shortages and the abundance of vacant urban land, have highlighted diverse approaches to gardening in cities.

Drawing on archival records of farming history, plus contemporary food system literature and interviews with present-day farmers and activists, this paper looks at the goals and strategies underlying Arizona’s urban gardening movements. I focus particularly on contemporary urban farms, which I see in the context of traditional “anglo-style” irrigated farming, brought to Southwest by white settlers since the 1880s and promoted since the 1900s by government legislation. The ready availability of water enabled high production of exotic crops and citrus, creating oases for human settlement. In contrast, I look at Arizona’s traditions of dry-water farming, consciously connecting both with contemporary design practice around rainwater salvaging and arid planting practice, but also traditions of tribal farming with drought tolerant native seeds. Agricultural landscapes have an ongoing (if sporadic) presence in landscape architectural history. Whether through leaders such as Frank Waugh and Jensen arguing for the role of agriculture as part of a North American stewardship; or contemporary designers incorporating agricultural images in otherwise urban designs; or designs demonstrating water retention and water capture for crop planting, the tradition is robust in landscape architecture. Understanding the various roles of urban gardening movement today invites scrutiny of a new reappearance of farming in North American landscapes.
Urban Fruits of the Northeast

Nathan Heavers, Virginia Tech, United States, heavers@vt.edu

Keywords: urban foraging, natural history, cultural history, local food

Foraging was the primary method of acquiring food for most of human history, but now is a peripheral activity in most societies. Surprisingly, in the affluent First World, foragers are once again entering the food chain—though in small numbers and mostly for secondary sustenance. In urban areas, this growing population looks to parks where plants and fungi are the usual objects of the hunt. This resurgence of food gathering in parks raises many questions, including: can foragers and parks coexist and how might we design for foraging? This poster addresses these two questions by taking stock of a dozen sought after species in the Northeast.

Each species today’s foragers seek has distinct natural and cultural histories. This study examines these histories through direct field observation and an extensive review of nearly four centuries of literature on edible plants of the Northeast. This poster represents investigations of the lifecycles and cultural uses of the dozen selected species and references William’s Key of 1643, Thoreau’s rediscovered manuscript, Wild Fruits, and “Wildman” Brill’s contemporary guide to edible plants, among others. In addition to this historical literature search, a review of recent newspaper articles on foraging focused on The New York Times and The Washington Post, reveals a spike in food coverage on foraging, a topic un-addressed in print during preceding decades and coincident with the growing local foods movement.

Within this recent coverage are discussions about the legality of harvesting in parks, health and safety concerns (poisoning in particular), and the impacts of harvesting on plant populations. This poster addresses directly the latter issue of how harvesting impacts populations of particular species, which varies by species and the culture and techniques of the harvesters. The spectrum of findings on the plant/forager relationship suggests that fallen fruit is up for grabs (even in public parks), picking foliage requires moderation, and whole plant harvesting can decimate populations. What parts of each species are desired, when they are harvested, the size of their populations, and their ability to regenerate under the increased pressure from foragers are critical aspects explored. The findings suggest that if the recent return to foraging is to persist and indeed be designed for, then one key aspect to growing and sustaining harvestable populations in parks is to address the cultural and biological relationships between forager and plant, species by species.
Variations on a Theme by Clarence Stein

Michael Martin, Iowa State University, United States, mdmartin@iastate.edu

Keywords: Radburn, Wildwood Park, Kitimat, Village Homes, Clarence Stein

The purpose of this presentation is to describe the evolution of the Radburn model through both concept and construction. The concept (expressed within a succession of designed places) evolved over time mostly because of changes in automobility; the constructed landscapes in each place changed significantly as residents adapted them to suit evolving cultural sensibilities.

Stein’s reversed house arrangement around a park-like commons and roadway minimalization, as exemplified at Radburn (Fair Lawn NJ, 1928), was an experimental variation on “garden city” principles but was also an explicit response to the problem of the integration of automobiles into everyday neighborhood life.

The Great Depression of the 1930s and the Second World War immediately followed the building of the first phase of Radburn, halting further development and in effect stymying further experimentation by imitators. Immediately following the war, Hubert Bird developed Wildwood Park (1947) in Winnipeg MB, a scheme directly influenced by Radburn but owing as much to Levittown as it did to Stein’s concept. Like Levittown Wildwood Park consisted of inexpensive pre-fabricated houses, but more significantly it featured infrastructural enhancements within common areas such as the looped lane, which afforded easier access by service vehicles while providing on-lane parking. Even more significantly, Wildwood Park “stretched” the dimensions of backyard space in order to accommodate automobiles and to afford a greater degree of resident design control in these private and semi-private areas.

The third experimental variation on Radburn was accomplished by Stein himself at Kitimat BC (1951), a “new town” that was possibly influenced by Wildwood Park but was certainly an effort by Stein to refine his original concept in a manner that acknowledged the increasing numbers of automobiles within neighborhoods. The latest experiment, Village Homes in Davis CA (1974), was an “eco-burb” variation on Radburn, introducing sustainability principles and a fluid, suburbanesque form that re-established the cul de sac and the dendritic street system as the vehicular circulation pattern.

Each of these experiments represents a refinement of Stein’s original idea, adjusting dimensions, pattern and landscape relationships for sake of automobiles but also to afford a greater degree of autonomy within private and semi-private neighborhood spaces. Each also has evolved considerably over decades of vegetative growth and resident constructions and re-constructions. As a design lineage, these experimental neighborhoods reveal a great deal about the negotiated landscape of North American neighborhoods.
Viking Cities: The Other Medieval Planning Tradition

Nancy Volkman, Texas A&M University, United States, nvolkman@arch.tamu.edu

Keywords: City planning history, Medieval era, Scandinavia, Ireland

Much focus in Medieval city planning history has been upon what could be referred to as the Southern tradition of planning, epitomized by Italian hill towns. In these studies communities, such as Siena or Florence, represent the key model of Medieval urban development. In fact, another tradition of Medieval planning, which could be referred to as the Northern tradition of planning, also exists, but has not been as well studied. This Northern tradition was influenced, depending on geographical location, by several precedents, including the Romans, but an important under-recognized influence was that from the Vikings, more correctly the Norsemen (from Norway), who conquered areas of northern and western Europe during the three hundred year period from 800 to 1100. It is this Norse-influenced tradition that the research presented in this paper will discuss.

This research grows out of work done by the author, working in several disciplines, over the last thirty years, beginning when she was employed at the archaeological site investigating the Viking origins of Dublin, Ireland in the ninth century A. D. Further research by the author during the past ten years has focused upon cities in the Viking heartland of Scandinavia, especially Norway. While this project relies on primarily on secondary sources, the fundamental research methodology was an assessment of city plans based upon archaeological, historical and contemporary mapping, as well as non-Norse written records, since the Vikings themselves did not document their planning efforts in either graphic or verbal form.

This paper will first examine the city plans from the Viking era in Scandinavia in general and then focus upon three Viking-founded towns: Birka, Sweden, Dublin, Ireland, and Oslo, Norway, as examples of the Northern tradition. A comparison of similarities and differences between the Northern and Southern traditions will then be made. Similarities include the use of what are called largos (enlarged street spaces) in Italy as open spaces and presence of irregular, non-geometric streets patterns. Important differences between the two broad traditions, such as the hierarchy of streets, topographic location of streets, and the absence of community-scale plazas in Viking towns, will then be discussed. The paper will conclude with a summary of some of the major northern and western European cities that demonstrate the influence of this northern tradition.
Virginia’s Crooked Road and the Landscape of Bluegrass

Brian Katen, Virginia Tech, United States, bkaten@vt.edu

Keywords: Cultural Landscape, Heritage Landscape, Place, Tourism, Memory

Virginia’s Crooked Road and the Landscape of Bluegrass

“The lay of the land…. played a big part in my music.”
Bill Monroe

This paper explores the dynamic and intimate relationship between Bluegrass music and the landscape of the Appalachian Region of Southwest Virginia. Today, tourists and Bluegrass aficionados traverse that landscape as they travel the Crooked Road: Virginia’s Music Heritage Trail, an over 300 mile network of rural byways that leads from music venue to music venue engaging communities, musicians, tourists, and regional tourism organizations and initiatives through the medium of Bluegrass.

Conceived to focus upon the “uniqueness and vitality of this region’s heritage music,” Virginia’s Music Heritage Trail, today serves to link musical venues, outdoor recreational activities, museums, regional craft exhibits, and historic and cultural programs in four cities and thirty towns across fifteen Virginia counties. Plans are being developed to transform the original Heritage Trail into a 19-county National Heritage Area. Missing from today’s Crooked Road travel experience, from the visitor’s experience of Bluegrass music, and from the current discussions focused on the Heritage Area designation, is an understanding of the role Bluegrass has played, and continues to play, in the active production of place. Building on earlier studies of the “place of music” (Cohen, 1998) and using the Crooked Road experience as a contemporary lens, this paper will explore how a particular place, Appalachian Southwest Virginia, and the resident’s deep attachment to that place is “socially, culturally, and materially produced through musical practice” (Cohen, 1998), a practice inspired by the landscape and expressed through Bluegrass lyrics, music, and shared performances.

Finally, this paper will demonstrate that listening to selected Bluegrass lyrics and music while traveling along the Crooked Road has the potential to enhance the visitor’s understanding, appreciation, and experience of the Appalachian landscape of Southwest Virginia and transform the Crooked Road into a sonic transect of the Appalachian landscape of Southwest Virginia.
White Gloves/Work Gloves: On-Site with Beatrix Farrand

Linda Jewell, University of California, Berkeley, United States, ljewell@berkeley.edu

Keywords: Farrand, On-site, Design, Women

“Unfailingly courteous she used competently her expressive hands to explain the work to the mason and the bricklayer: or to demonstrate how and when to prune: or even, when teaching a novice, to lay a few yards of drain herself.” Mildred Bliss, in Beatrix Farrand, An Appreciation. 1959

Although Farrand’s family background as a “society girl” with ties to wealthy families underlines her insight into the elegant lifestyles of her clients, Farrand never hesitated to roll up her sleeves and tackle the dirty side of building and maintaining gardens. Her time working closely with gardeners, carpenters and stonemasons resulted in designs grounded in the natural character, scale and eccentricities of each site. Her incremental decision-making through on-site clay models, full-scale mock-ups and field staking influenced both the final design and the signature images of her most successful projects. By examining timelines created from archival drawings, photographs and correspondence in the UC Berkeley CED Archives, Dumbarton Oaks and the Rockefeller Center this paper will evaluate Farrand’s process of making incremental design decisions on-site and the role of this process in creating her two best known gardens.

Between 1926 and 1935 Farrand supervised the design and construction of the Abby Rockefeller Garden, locating statuary, pathways, walls and plantings in the field as she developed the design. A key field decision occurred after she drew multiple sketches for a requested moon gate and then had movable plywood “dummy” walls constructed with moon gate designs. After photographing the mock-ups from multiple views, she made subtle changes to the exact location of the gate relative to two existing spruces and eventually located the moon gate entrance directly focused on the spruces and blocking the direct view into the garden to create the garden’s signature image.

Farrand’s oversaw a constant flow of field decisions over 26 years. (1921-47) at Dumbarton Oaks. Using dimensioning posts and “dummy” curbs, walls, benches and structures she incrementally adjusted each element to the site’s subtleties. Her photographs indicate the garden’s memorable “horseshoe stairs” began with a series of clay models placed in front of the stair’s proposed location. Construction proceeded incrementally with substantial modifications made to the stair including changes in the surrounding grades, retaining walls and the shapes of each individual step. With these two landmark projects, the study makes a case for the important role of an on-site design process in creating memorable landscapes.
Landscape Planning & Ecology
A Geodesign Approach for Energy Development-enabled Sustainability

Brian Orland, Pennsylvania State University, United States, b-orland@psu.edu
Timothy Murtha, Pennsylvania State University, United States, t,murtha@psu.edu
C. Andrew Cole, Pennsylvania State University, United States, cac13@psu.edu

Keywords: Geodesign, Marcellus, shale gas, community design

The health and sustainability of our cities will depend on the existence of viable inter-urban landscapes embedded with healthy and productive communities whose form is the result of deliberate design and planning. Instead, rural people remain dispersed, they drive to remote jobs and stores, and land and water are poorly protected. The rural population of Pennsylvania is 28% of the state total but growing—6% annually vs 4% for the cities. 25% job growth vs. 13%. Some of that growth is driven by recent and unexpected economic development opportunities. 18 million of the total 29.5 million acres of Pennsylvania are underlain by one of the most valuable energy resources in the world. The Marcellus shale gas beneath parts of Pennsylvania, New York, Maryland, West Virginia and Ohio is valued at over $1.5 trillion. Royalties for landowners could amount to $250 billion The potential windfall of shale gas development provides an extraordinary opportunity to consider and shape the fundamental sustainability of the rural supporting structure—its beauty, social and cultural vitality as well as its responsible use of energy, water, land and materials—but at the cost of imposing its own impacts. The landscape in which Marcellus shale gas development occurs is a “front line” for critical examinations of environmental sustainability relevant to numerous regions—nationally and internationally.

Design can be transformational in:
• Protecting existing values from resource extraction efforts.
• Long-term creation and conservation of energy within the immediate region
• Acquisition of water for sustenance of people, wildlife and land.
• Resilient adaptations or alternatives to the existing fabric of small-town and rural areas.

Approach and outcomes
In two consecutive years a geodesign approach in studios and research studies has addressed these goals for northern Pennsylvania landscapes:
• Community planning to support food, water and energy security
• Empowering citizens to create their own sustainable futures
• Graduating students in all fields willing and able to engage these pressing problems

A rule-based design approach aims to balance the multiplicity of technical, administrative, resource protection and quality of life mandates applying to these resource-rich landscapes. Parallel funded research activities use responses to the shale development as the vehicle for informal science education for adults. This paper will describe and evaluate the utility of the geodesign approach both as a student and adult learning mechanism as well as for its ability to develop novel and useful design alternatives for stressed rural landscapes.
ALL-IN: Speculative Landscape Infrastructures for Leveraging, Celebrating, and Contesting Dynamic Systems in Biloxi, Mississippi

Douglas Pardue, University of Georgia, United States, pardue@uga.edu

Keywords: landscape infrastructure, place-making, symbiosis, coupling, Biloxi, risk

Highly dynamic, pedigreed in risk, and periodically tabula rasa, Biloxi has long been a place for speculative designs. Since Katrina’s destruction in 2005, several plans, ranging from futuristic vertical visions to traditional town centers, have been proposed to potentially guide Biloxi’s renewal, but few address the specific potentials for landscape infrastructure to intermediate between environment, casino, and community scales.

Today’s polarized landscape of subdued economic growth, stalled recent mega tourist visions, and little prospect of reduced residential costs offers the perfect opportunity to revisit potentials for catalyzing Biloxi. Can a landscape infrastructural approach provide a productive interface between lost residential fabric, casino fantasies, and Biloxi’s incredible natural character? How might the landscape scales of infrastructure be brought into accord with the experiential scales of architecture and smaller landscape surfaces? What specific challenges and opportunities does this approach present to landscape studio teaching?

Within this context, a combined studio of landscape architecture and architecture students was tasked with developing symbiotic a public infrastructure network capable of leveraging Biloxi’s powerful, uncertain, and often antagonistic forces to achieve multiple objectives. Commensurate with place, game-based methods adapted from CHORA’s scenario games and Michaux’s graphemes were developed to advance design ideas and paired with readings on Second Nature, Infrastructural Urbanism, and Coupling. Working between scales of planning, site, and object, students developed network designs, prototypes, and ultimately, specific points within this network for human-scaled use in concert with other objectives.

This paper presents the studio’s process and findings of the studio and draws lessons for a shifting practice and pedagogy that pairs architectural and landscape infrastructural across scales and levels of intervention, and an increasing ability of landscape infrastructure to act as a symbiotic and catalytic framework. These visions provide valuable discourse for experimenting with the interface between human use and infrastructure operations, and specifically, for a place such as Biloxi, where few areas escaped Katrina, these visions provide valuable traction toward an urban growth framework that can adapt to, resist, and provide unique engagement with exceptionally unstable systems.
An Analysis of Permaculture Designed Communities in the Southeastern United States

Claire Ritchey, Auburn University, United States, ecr0001@auburn.edu
Charlene LeBleu, Auburn University, United States, leblecm@auburn.edu

Keywords: Permaculture, Ecological Design, Sustainable community, Green Housing, Landscape Architecture

There is a new way of thinking about how we live on our Earth; a way in which to view how we interact with it and sustain ourselves from it. A way in which human-ecosystem interdependence is recognized and the human-nature divide is minimized. Permaculture communities are created from a design system based on set principles and ethics which respect ecological systems. These communities are not the communes of the 1960's; they are urban or rural communities of people who are striving to integrate a supportive social structure, a thrifty economic model and a stronger respect for our Earth. They are our culture's escape from dirty cities and suburbia America. The purpose of this study is to examine and establish how Landscape Architect's can use permaculture design to create better communities.

Sources of research included case studies, journals, articles, books, and online databases. Cross reference, processing, and critical analysis were performed to understand the potential role of permaculture within Landscape Architecture.

The findings of this research show that permaculture is an ecological design system that withholds the triple bottom line of sustainability: Social, Economic, and Environment. It works toward a integrated relationship between landscape and people to provide food, shelter, energy and other needs in a harmonious way. Permaculture is governed by twelve principles of design that can be applied on a small scale, such as one's backyard garden, or a large scale, such as the development of suburbs. It takes into account food production, housing and structures, technologies, energy, and natural resources. It's methodology lies in a systems approach of the flora, fauna, geology, climate, culture, and economic systems.

The importance of this research is shown by the identification of permaculture communities currently located in the Southeastern United States and assess of them at multiple scales. More importantly, the twelve principles of permaculture design are applied to Landscape Architecture and more specifically, housing development. And most importantly, the intent, design, implementation, and effect of the twelve principles are evaluated and scenarios for potential improvement offered.
Applying Ecological Footprint and Ecosystem Services Methods to Calculate Ecological Capacity and Demand at a Countywide Scale

Christopher Sass, Kansas State University, United States, csass@k-state.edu
Bryce Lawrence, Kansas State University / Dortmund University of Technology, Germany, United States, btl8899@k-state.edu

Keywords: Ecological footprint, Urban metabolism, Landscape Ecology

Humans are consuming resources faster than can be produced by the biosphere, a global phenomenon called ecological overshoot measured by the Ecological Footprint, or EF (Rees and Wackernagel, 1996). Industrialized urban regions require global energy and material inputs while contributing harmful materials back to urban hinterlands at rates greater than can be remediated by natural systems (Wackernagel and Kites, 2006; Ripl, 2003; Brunner and Rechburger, 2004). The EF analysis method was developed to quantify this phenomenon and compare ecological deficits between nations (GFN, 2013). However, the EF method utilizes national level data, which when extrapolated to a regional level becomes less sensitive to variations in primary factors of the method (Umweltbundesamt, 2007). Therefore a case is made for a regional EF method that does not utilize global yield equivalency factors, instead comparing direct resource production to resource demand.

Urban region EF calculation methods were integrated into GIS (Luck, 2000) to develop spatially explicit EFs, and current local datasets were utilized in lieu of national datasets. The USDA Agricultural Census was utilized to estimate food biocapacity (USDA, 2007) and the USDA food pyramid was utilized to estimate food demand (USDA, 2011). Renewable electricity was estimated from a recent Council of Government greenhouse gas analysis (Mehta et. al., 2009) and carbon sequestration estimates for above ground and below ground carbon were culled from current research (Nowak & Crane, 2002; Follett, 2001). Renewable water capacity was developed from the USGS (USGS, 2012) and demand was estimated from actual usage rates (MoDNR, 2012). Waste flows were culled from a recent MARC report (MARC, 2003).

Results indicated that Jackson county provides 10% of the food demand from internal bioproductivity, can sequester 15.6% of the 20 million tons of carbon emitted annually (MARC, 2009), and excess water exists in our region for human, industrial and agricultural use. Approximately 11% of the total material flow in the county is cycled, leaving 89% of all waste in the county to be landfilled (MARC, 2003), and less than 1% of the electricity demand in the county is created with renewable electricity sources. The results support previous findings that urban regions cannot supply all categories of biocapacity and waste absorption needed for its population (Luck, 2000). Application of regional EFs in comprehensive planning help identify one-way material and energy streams in order to transform them to cyclical semi-closed thermodynamic units more akin to balanced ecological systems (Odum, 1971; Brown, 2005).
Channel Change in Northeast Kansas Streams

Christopher Sass, Kansas State University, United States, csass@k-state.edu
Tim Keane, Kansas State University, United States, whisker@k-state.edu

Keywords: Channel Change, Rosgen, Geomorphology

Changes in riparian systems and stream dynamics themselves are of growing concern worldwide, which ultimately threatens freshwater supplies. This study assessed and measured eighteen stream reaches in Northeast Kansas that contribute sediment to Tuttle Creek Reservoir, a U.S. Army Corps of Engineer reservoir near Manhattan, KS. This monitoring was completed in order to gain an understanding of the processes responsible for channel change and degradation in this ecoregion, as streams behave differently depending on hydrophysiographic controls of the specified ecoregion.

Eighteen reaches in the Black Vermillion watershed (410-square miles) were assessed and monitored over a four-year period beginning in 2007, annually May through June, utilizing Level IV Rosgen techniques and assessments. Streams were compared for channel changes in dimension, pattern, profile, sediment shifts, facet movement and overall bank stability. During this extent, general stream changes exhibited lateral migration and bed deposition (generally classified as a G-type or F-type stream using Rosgen nomenclature, or Stage IV-V using the Simon-Hupp model). The watershed is composed of mostly tillage agriculture with scattered acreages of pastureland.

Results over the four-year study period demonstrated the movement of streams through the landscape, sometimes at alarming rates. Banks as high as 25-feet experienced as much as three to four feet per year of bank erosion. Sediment shifts from gravel bottom streams changed to silt-clay bottom streams demonstrating the bank erosion was having profound effects on stream facets. Implications from studies such as this include increased awareness of stream processes in differing ecoregions, increased knowledge for stream restoration projects and a knowledge base for planning and implementation of landscape works.
Commemorating Africatown: A New State Park in Alabama

Charlene LeBleu, Auburn University, United States, leblecm@auburn.edu

**Keywords:** Africatown, slavery, state park, master planning

On July 1860, the ship Clotilde entered Mobile Bay loaded with people from West Africa destined to be enslaved in an area of Mobile County, AL now called Prichard, AL. Thirty-two of the Africans were taken to the Meaher Plantation in northwest Mobile County. They were released from slavery at the end of the Civil War and left on their own to survive. The group built shelters of whatever they found growing in the Alabama forests, and adapted their hunting to the delta area. They spoke their native language and are known to have remained a distinct community caring on their tribal traditions as late as 1958. This is the beginning of the community called Africatown, Alabama.

In order to preserve and interpret to the public the historic and cultural properties at and near Africatown, U.S.A., the Alabama Commissioner of the State Department of Conservation and Natural Resources donated in 1985 a parcel of land within the city limits of Prichard, AL to be known as “The Africatown, U.S.A. State Park.” This state park is to be built within the city limits of Prichard and is to be utilized as a park for recreational use by the general public. The park will recognize the significance of Africatown, U.S.A. in American history and culture and commemorate African heritage in the United States of America.

This paper reports research on a remnant ethnic population still living today in the bayous of Mobile County, Alabama. It discusses the reparation by the State of Alabama to recognize the existence of this population and describes the planning process of a new state park to celebrate their lives and those of their ancestors that will include: 1) an Institute of Ethnic Science and Technology, 2) a visitor's center, 3) museum, 4) theatre, 5) library and 6) other facilities for the interpretation of the historical-cultural features of the park and area. Methods include archival research, interviews, park planning and site analysis. Main findings show the development of a new state park master plan that will bear significance to the cultural history of Africatown, U.S.A. as associated with the historical events relating to the ship Clotilde as recognized by the Alabama Historical Commission in Montgomery, AL.
Endangered Species in the Parliament of Things: Climate Change and the National Wildlife Refuges

Catherine Seavitt Nordenson, The City College of New York, United States, cseavitt@seavitt.com

Keywords: Climate change, adaptation, animals, migration, endangered species, National Wildlife Refuges

Climate change adaptation is extensively studied in relationship to densely populated human settlements throughout the world, particularly in coastal environments, but there has not been an equivalent inquiry addressing the effects of climate change on non-human biota within or beyond those urban settlements. If we consider the environmental ethics of the stewardship of the wild, and if we acknowledge Bruno Latour’s position that we might assemble a human / non-human collective, the importance of the establishment of an adaptation plan for this broader biotic population is evident, and urgent.

One realm which has begun to address animal adaptation is found in the National Wildlife Refuges, the protected and managed system of publicly-held federal lands conserving wildlife and plants, overseen by the Department of the Interior’s US Fish and Wildlife Service. Established in 1903 by President Theodore Roosevelt, an avid hunter and naturalist, the enhancement and protection of the multiple habitats of migratory species is a fundamental aspect of the NWR mission. Scientists have noted shifting animal migrations as temperatures rise; these shifts, both temporal and spatial, are characterized by movements both pole-ward and upward in elevation.

This paper focuses specifically on the very few urban National Wildlife Refuges within the system of 555 refuges, and addresses the NWR’s proposed strategy to develop more urban refuges. The existing urban properties held by the system include the Detroit River International Wildlife Refuge, in the shrinking border city of Detroit; and the Bayou Sauvage National Wildlife Refuge, just beyond the levee-protected areas of New Orleans. A future 570-acre NWR has been proposed just south of downtown Albuquerque. The relative proximity of this site to the US-Mexico border will require a consideration of migratory animals, such as jaguars, hawks, and hummingbirds, whose movements are further challenged by the proposal of an illuminated double fence at this politically charged crossing. Species loss and possible mass extinctions are expected as sea levels and temperatures rise, droughts increase, and climates change. The land acquisitions established by the NWR have been historically delineated by the migratory paths of specific species and the demands of the Endangered Species Act (1973). The ESA linked the concept of the prevention of species extinction to land conservation. The NWR system and its 95 million acres of publicly-held lands must begin to address and respond to projected futures and the risks of habitat fragmentation and disappearance caused by global climate change.
GeoDesigning Wildlife Corridors: Merging Conservation Planning, GIS, and Landscape Design

Ryan Perkl, University of Arizona, United States, rperkl@email.arizona.edu

Keywords: GeoDesign, Wildlife Corridors, Conservation Planning, GIS, Landscape Connectivity Modeling

Conservation planners continue to face challenges in understanding and quantifying the negative ecological effects of landscape fragmentation on species populations. Stemming from this, landscape connectivity science has made significant strides in both the methodological and analytical components of tools designed to quantify fragmentation and model landscape connectivity. While these advancements have led to more analytically robust assessments and corridor delineations, the end result of these efforts is often the demarcation of such areas void of any insight as to their physical design. Few have taken the necessary next steps in exploring the functional effectiveness of the various policy, planning, and design alternatives that may be implemented within these modeled areas.

The emerging field of GeoDesign holds promise in addressing these design shortcomings via integrating additional methodical components and capabilities within connectivity assessments. Such improvements specific to conservation planning include the visualization of design components, graphic articulation of spatial characteristics, illustration of design stratagems for mitigating edge effects and increasing corridor function, and implementation tactics as they apply to linkage design. This work illustrates how methods developed in conservation planning can be utilized by traditional planners to better help inform the land planning and decision making process. Further, this work bridges the planning-design divide by integrating graphically stimulating design solutions as a means of implementing the modeled analysis.

To examine these methodological amendments and design components, a landscape-scale connectivity assessment was conducted within the Sonoran Desert, a large transboundary region which spans portions of the southwestern United States and northern Sonora in Mexico (311,000 km2). A down-scaled human footprint (30m resolution) was utilized as a landscape permeability surrogate. In so doing, a GeoDesign-based framework was coupled with a newly developed, data-driven, Automated Design Module (ADM) to physically design the modeled interiors of wildlife corridors. The ADM provides design guidance via referencing a series of spatial models which have been developed as part of a regionally specific native species vegetation library. The ADM then employs the use of several pattern generators to arrange the selected vegetation in configurations known to facilitate wildlife movement, mitigate edge effects, and increase a corridors connectivity function. Further, the ADM allows for corridor design at the landscape-scale which is often impractical via traditional design methods. This presentation focuses on the development of the ADM and showcases the modeling efforts and design outcomes for the Tucson metropolitan area and noncontiguous portions of Saguaro National Park in southern Arizona.
GIS-Based Coupled Cellular Automaton Model to Determine Irrigated Agriculture Land Use in the High Plains Aquifer Region

Peiwen Wang, Kansas State University, United States, penguin@ksu.edu
Eric Bernard, Kansas State University, United States, ebernard@unm.edu

Keywords: GIS, Agricultural Land Use, High Plains Aquifer, Cellular Automata Model

The Kansas High Plains region is a key global agricultural production center with ideal physiography and semi-arid climate (US GS, 2009). To augment water needs in crop production, farmers become increasingly dependent on the groundwater resource underlying the High Plains and Ogallala Aquifer formations. Given the growing global population, current policy and subsidy programs, the declining aquifer resource coupled with regional climatic changes call into question both short-term and long-term resilience as well as obvious questions of food and water security for the nation.

In this research, a Cellular Automata (CA) modeling approach is used to simulate potential land use distribution based on collection of raster cells reacts to its immediate neighbors (Batty, Xie & Sun, 2004). The CA approach considers existing infrastructure resources, industrial and commercial systems, existing land use patterns, and suitability modeling results from agricultural production. The results of the irrigated land distribution produced from the CA model provide necessary variable inputs for the next temporal modeling iteration. The raster are comprised of groundwater, economic, crop, and demographic models that are generated from the larger National Science Foundation (NSF) Coupled Natural Human Systems project investigating the theory of hyper-extraction. For example, the groundwater model indicates water availability for a growing season informing where irrigation can occur. The economic model projects which crop will be grown based on water availability and nearest food demand, while the crop model estimates potential yield of a crop under specific soil, climate and growing condition which further informs the economic model providing an estimate of net profit, which informs regional economic and population models.

Integrating the CA model into the coupled modeling system enriches the models by using actual landscape conditions across the study area and allows a key visualization component of coupled model results via land use maps. The outcome of this project hopes to afford decision-makers, including farmers, ability to use the actual landscape data and developed coupled modeling framework to strategically inform decisions with long-term resiliency.
Implementing Corridors for Climate-Induced Wildlife Migration: On-the-Ground Successes and Challenges in New York and Vermont

M. Margaret Bryant, State University of New York, United States, mbryant@esf.edu

Keywords: implementation, biodiversity conservation, landscape connectivity, climate change

Landscape connectivity, linking protected areas through landscape corridors, has long been a goal of conservationists, but climate change has significantly elevated the need and heightened awareness of this approach. This research evaluates conservation corridor implementation strategies undertaken in the federally funded Staying Connected Initiative (SCI). Implementation actions and results in two landscape linkage areas (approximately 12 towns located between the Tug Hill Plateau of New York State and the Adirondacks and 12 towns between the Adirondacks and Vermont’s Green Mountains) are compared. Planning strategies include easement acquisition and land use planning policies; design strategies include wildlife-friendly road crossings.

Conservation science often does not lead to conservation action, especially if implementation depends on privately held land and municipal planning and regulation. Biodiversity conservation research identifies this as a research-implementation gap. This research addresses the gap by developing a framework for understanding the relationship between science-based conservation plans, local and regional government planning capacity, and municipal government policy, planning, and design actions.

This research (1) describes and categorizes the different approaches to implementation being carried out by SCI partners in Vermont and New York, (2) evaluates the implementation environment in the two landscape linkage regions with an emphasis on successes and challenges to planning/design implementation, and (3) makes recommendations for bridging the conservation science - land use planning implementation gap. The results inform other linkage projects conducted in the New York to Maine region where SCI is being carried out, and could be more broadly applicable to landscape connectivity initiatives in other locations. Methodology includes municipal comprehensive plan review and evaluation, and semi-structured interviews with SCI staff partners, regional planners, and local government representatives in communities with adopted plans that address landscape conservation. This research addresses a growing need to implement biological conservation that extends well beyond a single project like SCI, especially as climate change concerns prompt greater demand for landscape corridors for species movement.

By participating in this session, attendees will
Identify the benefits of landscape strategies for climate adaptation and their role in protecting biological diversity
Compare the strengths and weaknesses of specific planning and design strategies for on-the-ground implementation of corridors
Learn how to combine multiple strategies to bridge the science-implementation gap
Outcomes will be assessed through end-of-presentation questions and answers.
Intentional Adaptation: Shaping the Land to Create a Dialogue Between a City and an Eroding Coastline

Grey Elam, University of Virginia, United States, kge3du@virginia.edu
Gwendolyn McGinn, University of Virginia, United States, gdm5hb@virginia.edu
Kristina Hill, University of California at Berkeley, United States, kzhill@berkeley.edu

Keywords: coastal erosion, accretion, landscape perception, fluctuation

By transporting sand from dredging operations, the coast of Virginia is maintained as an idyllic linear beach that appears to never erode. The proposed Virginia Beach Sand Engine replaces annual beach nourishment techniques with an extension of the beach built to erode over a period of twenty years and re-accrete along the shoreline.

Our design is based on the Netherland's Sand Motor precedent, constructed in 2011 by Rijkswaterstaat and the provincial authority of Zuid-Holland. It is located along the coast of the Hook of Holland to Scheveningen. The Sand Motor was designed by a team of engineers as an innovative form of coastal protection. Creating a landscape designed to erode is innovative in terms of economy and engineering; these proposals reimagine this technique through landscape architecture as a way of engaging a community with natural processes.

The objectives of this exploration are threefold; first, to make legible the processes of erosion and accretion over time; second, to link city to beach by breaking the hard edge manifested as a boardwalk; and third, to propose a form that will adapt to weather conditions and sea level rise.

Included are two strategies for meeting these objectives. One thickens the threshold of city to beach through a gradient of visibly constructed hydrological features. The other reveals change over time through the exposure of sand accretion along a transect perpendicular to the coast.

To bring to attention coastal erosion, Tidal Translations proposes placing tidal pools beside the traditional boardwalk. With the addition of 120 hectares of sand, the water table would rise significantly. Instead of discarding this excess water off-site, it is exposed in the form of constructed tidal pools. As the sand engine erodes, the water table will decrease, and the tidal pools will begin to disappear. The coastline that was 1500 feet from the boardwalk will once again be 300 feet. The presence of water will switch from ocean, to tidal pool, back to ocean.

Through a series of steel trellises Sequential Reveal intends to thicken the threshold from city to beach, while allowing the body to traverse through until no longer accessible. The trellises serve as an armature for North-South dune formation, while also revealing the processes of accretion and erosion at the body scale. The trellises serve as an armature for North-South dune formation, revealing the processes of accretion and erosion at the body scale.
Naturalness in Stream Restoration Projects: Learning from Johnson Creek

Nhasala Manandhar, University of Texas at Arlington, United States, nhasala.manandhar@mavs.uta.edu
Taner Ozdil, University of Texas at Arlington, United States, tozdil@uta.edu

Keywords: naturalness, stream restoration, greenness, openness, access to water

This research is to develop methods to assess the naturalness of restored stream environments by studying user perceptions and preferences in the Johnson Creek project in the Dallas and Fort Worth (DFW) metropolitan area. This research specifically concentrates on measuring three indicators of naturalness: greenness, openness, and visual access to water (Hepcan, et al., 2004; Dramstad, et al., 2006; Kaplan and Kaplan, 1978). This research also examines the suitability of GIS tools to measure naturalness in order to conduct similar studies without on-site surveys.

Streams are not just an urban infrastructure but also part of an ecosystem (Pinkham, 2001). Restored stream corridors can also be a significant component of a green and open spaces network in metropolitan areas. The re-introduction of such environments to green infrastructure in DFW is critical due to limited availability of such natural assets near densely populated urban areas (North Texas 2050, 2010). Although literature emphasizes the presence of nature as a determinant in users’ participation in such environments, there are limited numbers of reliable methods to measure naturalness especially in stream environments in urban settings.

This research uses quantitative methods, in the form of an on-site walkthrough survey, to measure user perception of naturalness; greenness, openness, and visual access to water and also in form of GIS tools to measure the presence of these three components of naturalness in restored stream environments (see also Holtan, 2012). A segment of Johnson Creek was chosen as the study site due to its recent restoration and its relevant importance for the users of the area.

In conclusion, the result illustrates that all three components studied in this research seem to be present in the study location, but users preference of greenness, openness, or visual access seem to vary from one data collection point to the other. GIS findings were similar to users ratings of the presence of the three factors in the on-site survey, illustrating that GIS tools has certain limited capabilities to provide tools to assess the presence of nature in restored stream environments. Research also illustrated that users’ preference of greenness, openness, or visual access seem to positively correlate with the presence of these attributes in most cases. Research also suggests that the GIS methods developed here could be utilized in other settings (such as riparian corridors or forests) which are not easily accessible but prone to design intervention to create a desired pedestrian environments.
Networking School Green Roofs to Achieve Storm Water Benefits: Brier’s Mill Run Watershed Case Study

Wenjie Li, University of Maryland, United States, kelly515@umd.edu  
David Myers, University of Maryland, United States, dnmyers@umd.edu

Keywords: storm water management; green roofs; Prince George’s County

In 2010, the United States Environmental Protection Agency (EPA) determined the Total Maximum Daily Load (TMDL), a “pollution diet”, for the Chesapeake Bay watershed for six states (New York, Pennsylvania, Delaware, Maryland, West Virginia, Virginia) and the District of Columbia. EPA required responsible agencies to develop statewide Phase I Watershed Implementation Plans (WIPs) to support the implementation for TMDLs. Previous planning efforts included the development of Subwatershed Action Plans (SWAPs), which provided a baseline of conditions, proposed tools for achieving TMDL reductions, and visions for the subwatersheds.

In 2012, the Phase II WIP process was developed to refine Phase I plans at the county level, including more local details about a variety of green infrastructure interventions to optimize nutrient and sediment load reductions. While green roofs were considered an important tool in the SWAP plans, they were not included in Prince George’s County’s Phase II WIP plans. Recently, Prince George’s County has implemented a new green roof incentive policy. In light of this new policy, this research explores how green roofs might contribute to reducing TMDLs. The research uses Brier’s Mill Run Watershed as a case study to demonstrate the benefits of both the incentives and the green roof as a tool in the SWAP plan.

This presentation is organized into four sections. First, we provide an overview of relevant storm water plans and TMDL targets for Maryland and Prince George’s County. In addition, we discuss the role of green roofs in the SWAP plan and the feasibility of green roofs on educational facilities, which provide the dominant amount of flat roof area available for green roof restoration. Secondly, we present two precedent studies: 1) the Bronx Design and Construction Academy and 2) the Calhoun School in New York City. These precedent studies demonstrate successes and educational programs and opportunities of completed green roofs in school facilities. The third section focuses on the role of green roofs in reducing runoff and improving water quality in the context of the case study. Brier’s Mill Run Watershed has a potential to provide 9 acres of catchment by green roofs. In the last section, we present a summary of existing green infrastructure incentives in Prince George’s County including the proposed rebate programs for green roofs. Finally, we summarize the importance of green roofs to planners and designers in achieving multiple benefits and continuing research questions.
New Beach Designs as an Urban Adaptation to Sea Level Rise

Rachel Stevens, University of Virginia, United States, rrs3es@virginia.edu
Kristina Hill, University of California, Berkeley, United States, kzhill@berkeley.edu
Nathan Burgess, University of Virginia, United States, nab3vw@virginia.edu
Amy Grady, University of Virginia, United States, aeg4q@virginia.edu

Keywords: beach nourishment, coastal ecology, community planning, climate change, urban adaptation, sea level rise

Recreational beaches and beaches with a structural role in coastal protection in the United States are regularly replenished with offshore sand. Increasing rates of relative sea level rise, both observed and predicted, present a challenge to the sustainability of all sandy beaches. Adaptation strategies where those beaches function as storm protection for urban areas, in addition to habitat and recreational resources, will become increasingly critical in this context.

For this study, we reviewed recent design prototypes for urban beaches that use a beach replenishment strategy known as “mega-nourishment,” in which very large amounts of sand are placed every 20 years, rather than smaller amounts every 1-5 years. With mega-nourishment, waves and wind re-distribute sand along the shore, rather than bulldozers and feeder tubes alone. Studies also show that typical beach nourishment techniques disturb coastal habitats, while mega-nourishment may offer superior habitat, creating large sandy beaches that are relatively undisturbed by additional nourishment for decades. Dredging methods and placement of sand in deeper water zones are cost-saving aspects of the Dutch experience that are transferrable to other sites. These beaches also provide a different range of aesthetic and recreational experiences than the typical tourist beach, and therefore require design investigation.

Our approach was to examine present conditions and future trends at Virginia Beach, Virginia, a region of historic significance that has one of the fastest rates of relative sea level rise in the continental United States. Our method was to develop a set of criteria for beach performance, and generate simple forms at multiple scales that could meet or exceed those criteria. We found that certain forms are most likely to perform well without generating new safety issues for swimmers, but that almost all of the prototypes would require designers to pro-actively engage the public about new aesthetic experiences not previously associated with beach resorts, or with other beach types. We met with city officials to gather feedback about the desirability of this adaptation strategy, and found mixed reactions to the aesthetic implications but strong interest in the cost savings.

Our findings are valuable because of their generalizability to adaptation efforts in many regions of the world. We also believe our results demonstrate the pressing need for design excellence in the mediation of aesthetic experience, as cities pursue adaptation strategies that seek to optimize multiple performance goals including cost, ecological benefits, storm protection, and recreational value.
Prescribed Grazing in Urban Settings: A Survey of the Legal Framework of Grazing Efforts Across the United States

Zachary Richardson, University of Georgia, United States, zachabides@gmail.com
Mikey Salter, University of Georgia, United States,
Eric MacDonald, University of Georgia, United States, eamacdon@uga.edu

Keywords: Targeted grazing, Prescribed grazing, Goats, Sheep, Ecoreveletory landscape management, Land use policy, Invasive species

Abstract: PURPOSE: This paper surveys municipal-level regulatory frameworks that govern the use of livestock for ecological restoration and land management in urban areas. Specifically, it examines how municipal ordinances may obstruct or facilitate the use of targeted-grazing by goats and sheep as a method for managing invasive vegetation, and suggests how public policy-makers may alter existing codes to support research and environmental remediation via targeted grazing. The paper discusses the potential benefits of targeted grazing, the key unanswered research questions about its effectiveness and “best practices,” and the roles of landscape architects, planners, scholars, and public policy makers in reshaping the legal landscape to support this emerging frontier of urban land management.

BACKGROUND: In cities throughout the U.S., landscape architects, planners, and other land management professionals are experimenting with the use of goats and sheep as biological agents for controlling invasive plants and assisting in the restoration of ecological function in woodland and riparian environments. A number of such initiatives are emerging in connection with scholarly research aimed at investigating the effectiveness, environmental impacts, and community-engagement potential of targeted grazing. In many cases, however, these efforts are constrained by municipal ordinances and policies that govern the use of domestic livestock in urban settings. Much of this legal framework was established decades ago, and it reflects a view of animal husbandry and other agriculture-related activities as “nuisance” land uses within urban settings.

METHODS: The authors conducted a literature review of communities throughout the U.S. where targeted-grazing initiatives are currently underway. To understand how the local regulatory environment affects such efforts, the authors interviewed individuals involved in targeted grazing in several of these communities. Using online databases, the authors reviewed land-use and other regulations that impact targeted grazing. Additionally, the authors interviewed local officials to determine what, if any, modifications were under consideration.

FINDINGS: The authors used the interview results and code analyses to develop guidelines to help municipalities revise land use policies to allow urban prescribed grazing as a landscape management tool.

IMPORTANCE: While many communities review land-use and other public in response to popular interest in urban agriculture, these reform efforts also should consider the roles of domestic animals as potentially useful agents for ecological restoration and remediation. In addition to providing guidelines to achieve this result, the paper offers a number of recommendations for how landscape architects may play a leading role in designing this legal landscape.

Joshua Cerra, Cornell University, United States, jfc299@cornell.edu

Keywords: urban ecology, habitat enhancement, development

Urban areas are complex landscapes that serve the needs of many populations, both human and wildlife. Historically, many of these areas have developed with limited concern for the environment, generating negative impacts on ecosystems and the landscapes that support them. However urban landscapes still harbor habitat features that provide important ecological functions for hundreds of species. Publicly maintained sites certainly provide examples of such spaces. A study in the greater St. Louis area, for example, highlighted the value of the city’s large urban parks as habitat for avian species (Oliver et al, 2011). Additionally, other research and modeling indicate that even in heavily populated areas, wildlife may use private, as well as public, properties during their life histories within a network of landscape ecological corridors that exist independently of ownership types (Rudd et al, 2002).

While habitat enhancement of large sections of public property may be achieved through existing mechanisms for public lands management, strategies for improving habitat value on private property are more challenging and elusive. As development pressures in cities rise, how is it possible to strategically address issues of habitat quality on private land? New approaches must be explored to encourage coordinated, beneficial habitat improvements on private property (Nassauer, 1997).

This paper outlines several strategies used by the author and others for enhancing habitat quality on private land that are compatible with private property ownership and landowner preferences. It highlights recent initiatives and programs, including market–based sustainable development certifications, policy programs, and community planning efforts that reposition private projects as opportunities to actually support urban ecological goals by working in cooperation, rather than in conflict, with development. The author will also outline new research that seeks to refine approaches for working with private property landowners at the neighborhood scale to coordinate urban habitat enhancement. With most of the world’s population now living in urban areas, these approaches to habitat enhancement on private property are emerging as important strategies for maintaining ecological function in cities in an era of rapid urbanization and landscape change.
Programming the Middle Landscape: Cherry Grove Farm Case Study

Holly Grace Nelson, Rutgers, the State University of New Jersey, United States, hgrace@rci.rutgers.edu

Keywords: agriculture landscape openspace

Leo Marx defined the middle landscape, between wilderness and the city, as subject to pressures from both extremes. For Marx, the middle landscape was a garden, but that garden was often farmed land—neither purely wild nor overly humanized. The farm used to be the transition between city and wilderness; today, suburbia is often that transition between city and wilderness. Agricultural land today is often more in “the middle” than ever—wedged between city, suburb, and wilderness— with new challenges such as regulations (land use, zoning, etc.), neighbor conflicts, and the inefficiencies of smaller scale farming (due to high land costs).

This paper explores the potential urban, community and environmental benefits of public programming on small farms through a case study of Cherry Grove Farm. We have a new type of exurban landscape where suburban life, agriculture, and natural ecosystems struggle for landscape dominance. Many farms struggle to remain profitable, and the future of farming in this new landscape requires new strategies. “Agriculture in the middle’s” strength is not maximum efficiency— it’s flexibility and innovation that allows smaller farms to produce niche market items, including a growing demand for fresh, organic products that cost more. Farms could become part of regional foodsheds, providing direct consumer access to fresh food.

Small and mid-sized farms, like Cherry Grove Farm in Lawrenceville, New Jersey, are exploring transformative opportunities in their location near populous areas. Cherry Grove proposes two ways to increase direct farm experiences: a farm education center and a farm. The Cherry Grove studio directly engaged students at the farm scale but also at a regional scale when students developed educational connections to nearby schools and to inner city students and made connections from the farm trail to regional trail systems. This on-farm programming for people will enliven the farm in new ways, broadening public support for local farming while increasing profits through direct sales. These are programs previously not seen as typical farm facilities but are becoming a societal necessity.

New paradigms are emerging. More farms are embracing the peri-urban condition by inviting the public in—to improve their bottom line, but also to offer solutions to larger community issues such as walkability, access to recreational facilities and healthful food, as well as ecosystem services (habitat diversity, soil fertility, etc.). Landscape architects know how to integrate people and places and are well-positioned to facilitate these changes.
Reimagining a Sustainable Future for Mine-Scarred Lands

Angela Campbell, West Virginia University, United States, angela.campbell@mail.wvu.edu
Peter Butler, West Virginia University, United States
Jing Chu, West Virginia University, United States, jing.chu@mail.wvu.edu
Ayaka Hosogaki, West Virginia University, United States, ahosogak@mix.wvu.edu

Keywords: sustainable energy, low impact development, mine restoration

Surface mining has historically dominated the economy and landscape of West Virginia and Central Appalachia. While coal mining remains an important industry to the area economy, it is no longer the major provider of jobs and has left the region with a degraded and polluted landscape. Processes associated with mining have led to increased stormwater runoff, soil degradation, contamination of streams, accumulation of airborne toxins, and loss of biodiversity. These processes and their impacts pose serious risks to environmental and human health. Mine restoration procedures typically involve grading and compacting nutrient poor soils and sparsely planting scrubby vegetation, which yield marginal improvements to landscape performance and aesthetics. Faculty and students are working to envision a sustainable future for a 600-acre former coal mine in McDowell County, West Virginia. Plans for the site will provide a green energy industry alternative to coal through sustainable development initiatives, while restoring, to the extent possible, ecosystem services adversely impacted during mining operations. Community engagement focus group meetings and a multi-disciplinary environmental assessment where used to build a framework that demonstrates the viability of alternative energy and green infrastructure practices that respond to a local need for mixed-use development. Using cultural vernacular, recreation, housing, commerce and transportation will blend practices such as biomass, solar, and wind energy production. The site will not only generate local economic growth through the development of renewable technologies, but will restore ecosystem services which foster ecological and social benefits within the community. A three-dimensional model of the site using LiDAR (ground-based aerial) was created to test a variety of planning scenarios and landscape visualizations for site. On-site experimental stations will test green infrastructure and biomass production viability prior to implementation. The visioning for this space may become a model for sustainable energy and low impact re-development on mine-scarred brownfield landscapes throughout West Virginia and the Appalachia Region.
Re-presenting Nature: Developing a Stream Swamp Forest Interpretive Exhibit

Robert Brzuszek, Mississippi State University, United States, rbrzuszek@lalc.msstate.edu
Timothy Schauwecker, Mississippi State University, United States, tjs2@lalc.msstate.edu
Gordon Lackey, Mississippi State University, United States, gml60@msstate.edu

Keywords: stream, ecological design, students, wetlands

This study explored the design and development of a Small Stream Swamp Forest Exhibit at the Crosby Arboretum, Picayune, Mississippi. At Pinecote, the Crosby Arboretum’s 104-acre public interpretive center, exhibits are constructed that incorporate and showcase locally-occurring ecosystems. The proposed exhibit will provide a venue for public education and their experience of these vulnerable landscape types. The Crosby Arboretum Foundation was awarded a grant to create a Small Forested Stream exhibit within approximately four acres of Arboretum property. Graduate students in the Department of Landscape Architecture at Mississippi State University utilized a semester-long class service-learning project in spring 2011 to research and design the Stream Exhibit. Students conducted a literature search on forested streams and related wetlands, and visited several natural creeks in Mississippi. Students recorded environmental data at the natural wetlands to inform the detailed design as well as a review of spatial data and aesthetic elements. Participants also conducted an environmental inventory and analysis at the proposed exhibit site that recorded the site’s physical, biological and cultural processes. A design charrette was conducted with associates from Jones and Jones landscape architecture office in Seattle, WA and other specialists in order to analyze and conceptualize the preliminary design. From the four charrette group proposals, one design was drafted that synthesized the proposals. While the methodology includes steps used in traditional ecological restoration process, the additional study of spatial considerations and design elements was useful to result in better influence visitor experiences. The value of this research is to synthesize a methodology that hybridizes scientific restoration principles with aesthetic concerns. The resulting plan was an interpretation of a forested stream and includes a variety of program elements to enhance the educational and experiential nature of this exhibit. By utilizing research and in situ studies of representative forested wetland communities, the end design was better informed to include the variety of plant community habitats found near forested streams--which can serve as teachable experiences for wetland education. The exhibit will serve as an outdoor classroom for area schools and the visiting public and the project will include an environmental education program that focuses on the water quality values that forested wetlands contribute in the Gulf Coastal Plain. This will be accomplished through the development of study learning guides, wayside signage, and trail brochures. Exhibit construction is scheduled to be completed by June 2013.

Chingwen Cheng, University of Massachusetts Amherst, United States, chingwen@larp.umass.edu
Elizabeth Brabec, University of Massachusetts Amherst, United States, ebrabec@larp.umas.edu
Robert Ryan, University of Massachusetts Amherst, United States, rryan@larp.umass.edu
Paige Warren, University of Massachusetts Amherst, United States, pswarren@eco.umass.edu
Craig Nicolson, University of Massachusetts Amherst, United States, craign@eco.umass.edu
Michael Strohbach, University of Massachusetts Amherst, United States, strohbach@eco.umass.edu

Keywords: stormwater BMPs, flooding risk, future scenarios, climate change

One of the major impacts of the impervious surfaces associated with urbanization is the alteration of hydrological cycles, resulting in excessive runoff, lack of infiltration, and insufficient aquifer recharge. Consequently, flooding related disasters remain a significant threat for many communities, particularly under the increased intensity and duration of storm events promised by climate change. Population growth is projected to increase 11% from 2000 to 2030 in the Boston Metropolitan Area (MAPC 2009). Given the hydrological impacts of climate change and land cover change derived from urbanization, increased urban population implies the fact that more people are likely to be exposed to flooding hazards thus increasing flooding risks.

The Boston Urban Long Term Research Area (ULTRA) project outlined four population growth and greening scenarios. A Current Trends scenario serves as a baseline in comparing to a Metro Future scenario outlined by the Metropolitan Area Planning Council. Additionally, the ULTRA team created a Green Equity scenario focusing on greening investment in low-income neighborhoods, and a Compact Core scenario emphasizing concentrated development in the inner core communities. Each scenario varies in the level of population projection and degree of greening investment (e.g. stormwater BMPs, trees). Based on this project, this study aims to answer the following questions: (1) How does population growth alter land use and urban landscape as a result of increased housing demands? (2) In what way does development density affect land cover associated with stormwater best management practices (BMPs)? (3) To what degree does stormwater BMPs reduce long-term flooding risks in future land use and climate change scenarios?

We analyze flooding risks in 33 municipalities in the Charles River watershed within the Boston Metropolitan Area. We conduct housing density analysis for land use scenarios in 2030. In addition, we develop land cover scenarios based on potential stormwater BMPs implementation in Low-Impact Development strategy for future scenarios. Finally, we assess flooding hazards using Soil and Water Analysis Tool (SWAT) hydrologic modeling (Cheng 2012).

The results indicate that the aggregated benefits of applying stormwater BMPs have some effects yet BMPs alone are insufficient in mitigating climate-induced flooding risks. Preserving large open space (agriculture and forest lands) from development demonstrates a greater benefit for flooding mitigation in future land use scenarios. Therefore, comprehensive landscape planning integrating both structural and non-structural stormwater BMPs plays a significant role in reducing the climate-induced flooding risks in the Boston Metropolitan Area.
Sea Level Rise Adaptation Strategies: A Case Study of Mokpo, Korea

Yumi Lee, Seoul National University, Korea, Republic Of, yumil@snu.ac.kr

Keywords: Sea Level Rise, Adaptation, Reclamation, Coastal Development

Introduction
Two major factors causing the coastline changes are: coastal land reclamation, which has significantly contributed to waterfront development in the past, and sea level rise, which is expected to gradually alter the global coastline in the future. Large-scale coastal land reclamation has led to the creation of large buildable areas over the past century and has pushed the coastline outwards. On the other hand, sea level rise is expected to bring the coastline inwards, resulting in massive inundation and damage to major shoreline infrastructure and waterfront settlements.

Sea Level Rise Adaptation Strategies: Mokpo, Korea
Climate Change and Sea Level Rise issues bring up the necessities of adaptation strategies for coastal areas. The paper carries out a case study of Mokpo as a sea level rise adaptation experiment site and suggests five adaptive strategies for sea level rise: defend, accommodate, retreat, attack, and buffer.

Mokpo is an old port city on the southwestern tip of Korean peninsula, formed by tidal flats and low hills. Mokpo has been expanded through 100 years of land reclamation history, and as a result, about 60% of total land area is reclaimed and most of these reclaimed areas are susceptible to future inundation caused by sea level rise which is predicted to be 1.36m higher in 2100. Currently, Mokpo has been experiencing frequent floods during the high-water and storm events, and planning for large-scale flood prevention project.

Conclusions
This paper argues that reclaimed land is most susceptible to future inundation due to its low elevation and land subsidence. For existing coastal developments, the protection of major infrastructures and the retreat of urban development are the fundamental adaptation strategies. However, it is utmost important to consider the impact of Sea Level Rise for on-going, and future coastal developments. The paper attempts to offer insight into understanding nature as a living organism and adapting to its transition and, in the process, highlights both the challenges and opportunities for future coastal development.
Study of Landscape Fragmentation as an Impact of Natural Gas Drilling in North Texas

Anjana Pradhananga, University of Texas at Arlington, United States, anjana.pradhananga@mavs.uta.edu  
Pat D. Taylor, University of Texas at Arlington, United States, pdt@uta.edu  
Taner Ozdil, University of Texas at Arlington, United States, tozdil@uta.edu

Keywords: landscape fragmentation, natural gas drilling, land use, longitudinal data, and GIS tools

The objective of this study is to determine the degree to which natural gas drilling contributes to landscape fragmentation in North Texas. The study is done on the Barnett Shale in North Texas where the first natural gas play kicked off in the 1980s (Arthur and Alleman 2008.) The findings of this study are expected to be useful for understanding and foreseeing the ecological impacts over time and pointing-out solutions for future developments. The study also provides guidance in setting priorities for efforts to reduce adverse impacts on natural gas drilling on landscapes. The findings are expected to be useful integrals in state, regional and local planning processes associated with surface drilling for natural gas in the region.

Serrano (2002) defines landscape fragmentation as "landscape's lack of connectivity, the mechanisms that cause it and the subsequent alteration of ecological processes" (p. 113.) Landscape fragmentation can also be defined as "the breaking up of a habitat, ecosystem or land-use type into smaller parcels" (Forman 1995.) Gulinck and Wagendorp (2002) add that "fragmentation is the disintegration of existing geographical patterns by the introduction of new elements or structures, in such a way that the existing or desired functions are impaired" (p. 138.)

In the case of North Texas, landscape fragmentation results from road construction, urbanization, and other human development which impact wildlife and habitat, including many species whose sustenance is of concern (Forman et al. 2003.) Natural gas drilling is one of the more recent activities which have changed the landscapes of North Texas. Barnett shale accounts for 16,346 gas wells (Railroad Commission of Texas 2012.) The clearing of land for well pads, access roads, pipelines, and heavy truck traffic from hauling water and waste materials, causes erosion of top soils thereby affecting the condition of landscapes (Paleontological Research Institute 2012.)

This study is carried out by collecting longitudinal data primarily from literature related to surface drilling and landscape fragmentation in North Texas. In-depth interviews of key informants such as landscape architects, planners, environmentalists, industry representatives and others are used to verify connections between natural gas drilling and fragmentation. GIS tools are used in the search for fragmented conditions, both historic and current.

Learning outcomes for this session include the identification of components of natural gas drilling that are responsible for landscape fragmentation. It also includes identification of procedures and steps to follow to lessen the impact in future developments.
Tangshan Nanhu Eco-city Central Park - From Brownfield to Green Park

Jie Hu, Beijing Tsinghua Urban Planning & Design Institute, China, tsinghuala@gmail.com

Keywords:

The purpose of this presentation is to introduce landscape performance benefits provided by a brownfield development project in China: Tangshan Nanhu Eco-city Central Park. The project was selected for as one of the Landscape Architecture Foundation (LAF) Case Study Investigation (CSI) projects in summer 2012. The significance of this presentation is the international awareness of the need of landscape performance, as well as metrics used to quantify the performance benefits.

Tangshan is the birthplace of Chinese modern industrial civilization, with abundant underground coal resources. In 1976, Tangshan suffered a 7.8 magnitude earthquake, a large area mined out space collapsed and settled. Nanhu area became a typical urban brownfield filled with urban and industrial waste, as well as domestic sewage. The total area of the Eco-city is 105 km², and the Central Park within the core area is 630 ha.

In August 2008, based on the analysis and research regarding the geological structure and potential risk of continued coal mining subsidence in Nanhu, designers started a series of research and planning studies: utilizing Geographical Information System (GIS) for the analysis of the status of land use, collecting eco-factors, evaluating land eco-sensitivity and construction suitability, and determining an appropriate and secure basis for land development.

The park was designed as an urban public space focusing on the ecological restoration of a settling area. Designers integrated the factors of natural environment, historical culture and modern civilization, preserving and restoring the existing essential landscape elements to form a holistically spatial structure and created a security, open and comfortable urban park. The park is divided into northern and southern parts. The northern part is basically stable and featured with large natural landscape construction and public recreational facilities. The southern part is still partly unstable and designed as ecological conservation and restoration. A 270 ha lake has been formed and large area wetland landscape was designed. There were over 160 types of plants used to form a diversity of ideal habitats. Following the completion of Nanhu Central Park, the extreme minimum temperature has increased 3-4°C and extreme maximum temperature has decreased 3-4°C; urban green coverage has increased to 44%; the number of wild bird species has increased to more than 100; in holidays, an average of over 100,000 people visit the Park everyday; land value surrounding has increased at least 16 billion dollars.
Urban Trail System Planning in Western United States: An Analysis of Process and Implementation Efforts

Carlos Licon, Utah State University, United States, carlos.licon@usu.edu
Kenneth Richley, Utah State University, United States, richleys@comcast.net

Keywords: urban trail systems, greenway planning, greenways Western US

Rapid growth in the Western US is creating pressure on communities to plan and provide open space. One critical element in open space systems is connectivity, most often in the form of greenways. In many cities these greenways contain urban trail systems that provide significant recreation and other open space benefits.

This study investigates the current models used for greenway planning, synthesizes them into a recommended model process and compares case studies that have implemented urban trail systems against this model framework. The case studies include cities in the West with populations between 50,000 and 100,000, not part of a metropolitan area, with demonstrated planning and implementation of urban trail systems.

The study builds a model framework for greenway planning from the analysis of publications and government implementation documents. A selection of cases helped to contrast and verify the transfer of the model process suggestions into implemented actions. A checklist of relevant stages of plan development was produced to guide communities in their greenway planning and implementation efforts.

Three critical factors arose common to all case studies. First, the need to follow a trail-specific planning process. All the communities studied have made efforts to plan for trails apart from their general plans. Second, the planning process needs a robust public participation process. This ensures that community needs are met and buy-in is achieved for successful implementation. Lastly, the early identification of trail corridors is essential to the long-term planning process. This ensures there are no surprises when implementation begins. These factors should receive particular attention from communities wishing to develop urban trail systems.

Developing a recommended model process will aid communities in planning for greenways by providing a step by step process from concept to implementation. This can provide a roadmap for communities that do not have experience with these planning models and can be used by citizens and non-planning professionals as well. In addition, the model process is presented in a “quick-reference” format. This step-by-step guide, together with a list of resources facilitates greenway planning implementation efforts.

Learning objectives and outcomes include: learning about the ideal steps in a process of greenway planning from concept to implementation; identifying key moments for public participation; and learning from successful implementation efforts through the case studies reviewed. Assessment may be demonstrated by the discussion of the model framework applicability and case studies findings.
People-Environment Relationships
A Comparative Study of Perceptions and Barriers to Walking in Residential Neighborhoods

Chuo Li, Mississippi State University, United States, cl1004@msstate.edu
Robert Jackson, Mississippi State University, United States, rj185@msstate.edu

Keywords: residential neighborhood, walking, physical activity, environmental perception

In the past decades, rapid urban growth and industrialization have brought significant changes to human settlements and have resulted in some negative impacts on public health (Vlahov and Galea 2002). A significant increase in death rates attributed to chronic diseases raised concerns about decentralized urban forms and land-use controls (Foley et al. 2005). The high prevalence of physical inactivity is considered an underlying cause for obesity and some of these chronic diseases, which partly results from the modern patterns of the transportation system, land use development, and urban design characteristics (Frank et al. 2004).

Many studies have been conducted to explore various characteristics in the urban environment that can affect physical activity (Gebel et al. 2007). However, most of them have examined multiple but discrete environmental features. Relatively few evidence-based studies have examined how community design features operate in concert to create places that have the right combination and the composite characteristics that encourage physical activity (Alfonzo et al. 2008). In addition, many studies were conducted in an urban context. It remains unclear whether these research findings can be equally applied in a rural context that has different socio-economic conditions, low residential density, and predominantly agricultural land uses. It is especially necessary in the region of the American South, which has the highest obesity rates of the nation to conduct a context-specific examination on perceptions toward physical environments that would encourage or discourage physical activity. Also important is an empirical understanding of the perceived environmental barriers that hinder the local people from living a more active lifestyle, so that these might be understood and overcome.

This paper studies six neighborhoods in the city of Starkville, Mississippi, of which two neighborhoods are considered traditional neighborhoods that were developed before WWII, two are early modern suburban neighborhoods that were built in and after the 1970s, and another two are late modern suburban neighborhoods built in and after the 1990s. Through comparative analysis of the three typologies of neighborhood, the research adopts mail-back surveys to access residents’ perceptions of neighborhood characteristics and perceived barriers to walking, which are grouped into four indices including accessibility, traffic safety features, aesthetics, and social environment. It then uses Analysis of Variance (ANOVA) to analyze the differences among the three typologies of neighborhoods and explore the combined neighborhood characteristics that have the most effect on walking.
A Home Away From Home: Biophilic Design for Confined, Long-term Dwellings Synonymous with Spaceflight and Spaceflight Analogous Environments

Scott Begly, Pennsylvania State University, United States, ssb5184@psu.edu
Sean Burkholder, Pennsylvania State University, United States, slb59@psu.edu

Keywords: biophilia, biospherics, bioregenerative systems, space colonization, environmental psychology

The human population continues to grow exponentially. By the end of 2011 the human population was predicted to, and reached 7 billion (Kunzig 2011). The rapid increase in human population and the post-industrial-revolution world’s insatiable appetite for land, energy, and raw materials has placed a demand surpassing our planet’s resources; propelling space colonization and off-earth resource acquisition to satiate current and future material needs (O’Neill 1976, Schmidt et. al. 1996, Harrison 2001).

Traditionally, space flight has been less-than economical; but with the privatization of the space industry, companies such as SpaceX, Virgin Galactic, and Blue Origin, are working to provide an inexpensive means to reach beyond Low-Earth-Orbit (LEO) by way of Single-Stage-To-Orbit (SSTO) spacecraft. The development of SSTO craft will eliminate the current ‘terrestrial dark age’ and provide functional and economical shipping vectors of mined space resources, from space colonies to earth, as required by asteroid mining companies such as the Seattle, WA-based Planetary Resources, Inc.

Environments synonymous with long-term isolation (urban living, submersibles, prisons, space colonies) promote high levels of tension, anxiety, depression and anger (Palinkas 2004). Conversely, Erich Fromm and E.O. Wilson’s avant-garde theory of biophilia, or the “love of life or living systems” is an essential concept in promoting a livable, built environment through landscape architecture and architecture. The integration of biophilic components into the built environment has been shown to improve both physical and mental health in humans while simultaneously improving their productivity (Ulrich 1984, Kaplan 2001, Hauplik-Meusburger 2011, Browning et. al. 2012). Landscape architects have the exquisite opportunity to be proactive, and look to biophilic design to mitigate mental disorders associated with confined space habitation, in contrast to the traditionally reactive stance of the discipline. This implementation of designed natural landscapes in unnatural settings can be utilized to explore solutions to future obstacles that will be encountered to maintain the present and future quality of life for the human population.

As applied to long-term spaceflight and spaceflight analogous environments, biophilic design has the potential to drive the successful design, development, and implementation of aesthetic Self-Contained-Bioregenerative-Systems (SCBS) and foster In-Situ Resource Utilization (ISRU) required to maintain the delicate ecoopoiesis of long-term space habitation. Furthermore, using biophilic and landscape architecture design principles as a framework, a consilience of knowledge of concepts derived from art, science, and technology is feasible and essential to solving the challenges associated with long-term residency in confined environments.
A Visual Inquiry into Metropolitan Areas and How They are Perceived by Urban Planners

Frank Sleegers, University of Massachusetts, United States, sleegers@larp.umass.edu
Martin Kohler, Hafen City University Hamburg, Germany, martin.kohler@hcu-hamburg.de

Keywords: walking, mental map, geography, urban, planning, landscape, legibility

This study investigates urban planning experts’ perception of the former U.S. manufacturing cities Springfield-Chicopee-Holyoke through photo-driven interviews. The photos were taken from a walking tour through predominantly suburban areas of these cities as a transect of the planners’ urban territory. How do urban planning experts mentally order these regions? Understanding complex metropolitan regions and particularly the disperse patterns of urban sprawl is a challenging task. Relevant to this is the perception of place. Place is a most comprehensive term that describes an environmental character or atmosphere. Depriest-Hricko & Prytherch investigated the relationship of sense of place and urban planning through a study that employed a mixture of methods for gauging sense of place expressed as stories from community participants and community visions.

An approach that reflects the comprehension of complexity in cities is the activity of walking. The relationship between the understanding place and urban walking has been extensively discussed in the social sciences. De Certeau wrote on the practice of everyday and linked the movement in urban environments to the analysis and production of places.

The paper had following results: 1) urban planning experts have little knowledge about the areas between the cities’ cores. The planners were surprised by the huge amount of photos from suburban areas, only a small number of these photos were assigned with the correct geographical place, reaction to the representation of these areas had sometimes a belittling undertone, planners at times seemed to be overwhelmed by the task to order photos of these areas; 2) areas that are clearly recognized possess either distinct physical objects or edges or have polarizing character such as rural, high density urban or heavy industrial. Lynch’s theory of identifying elements of the city is verified for edges, paths, landmarks, gateways but less for the more abstract element of residential districts; 3) the professional planners demonstrate personal knowledge of their main planning territory defined by administrative boundaries. The study revealed that planners have a focus on their planning territory with little overlapping knowledge between municipal boundaries; the knowledge seem to gradually diminish from core to periphery.

Taken together a noteworthy fact emerged: the prevailing suburban residential areas do rarely occur as key themes in the interviews and seem to be underrepresented in the planners’ perception.

As a methodology, the basic activity of walking is suggested to improve planner’s knowledge and understanding of cities and suburban areas.
Ahupua’a as A Model for Sustainable Productive Urban Landscapes

Judith Stilgenbauer, University of Hawaii at Manoa, United States, jstilg@hawaii.edu

Keywords: ahupua’a, productive landscapes, sustainability, urban agriculture

This paper investigates the ancient Hawaiian land management system known as ahupua’a as a design and management model for contemporary self-sufficient productive urban landscapes. Through analysis and dissemination of key ahupua’a principles this presentation enriches the current ecological urbanism discourse on multi-purpose urban agricultural systems. Further, this research examines the modern-day applicability of the ahupua’a concept in urban contexts.

The self-sustaining ahupua’a system of land and resource management was the organizing principle behind ancient Hawaiian life and land use. Ahupua’a was based on the protection of common resources that sustained all life and the profound understanding that the health of the land and its elements was directly related to the long-term health of the people who occupied the land. Community-based, self-sustaining resource management and land stewardship with a focus on fresh water formed the basis for a functioning productive system that did not compromise natural resources, ecosystem performance, and biodiversity. In recent years environmental designers have focused intensively on the integration of productive landscape components such as systems of local food, resource, and energy production into urban landscapes (Crawford, 2010; Imbert, 2010; Viljoen, 2005; Waldheim, 2011; Yu, 2010; et al.). Public urban agriculture and forestry concepts that make productive processes experienceable—particularly the idea of integrating local food production and distribution into design concepts and operational strategies for public parks and urban leftover spaces—are on the rise (Stilgenbauer, 2012).

However, for more public productive/ornamental hybrid open spaces to come to fruition, new land-use, management and maintenance practices are required. In this context, important lessons can be learned from the pre-colonial Hawaiian ahupua’a concept that was deeply rooted in the interplay of landscape systems, infrastructure elements, and community involvement.

Today’s urban communities are characterized by a dramatic disconnect between city dwellers and performative (problem-solving and productive) resource systems. A thorough understanding of ahupua’a’s underlying principles contributes to the development of more sustainable and interconnected 21st-century urban resource management systems. By raising awareness, this paper intends to disseminate knowledge of an ancient concept that is of great relevance to contemporary efforts to move towards more self-sufficient communities. Lessons learned from this ahupua’a study further the contemporary discussion on sustainable productive landscapes and contribute to the development of urban landscape design solutions and operational strategies that allow for the conversion of input-intensive, underutilized, fruitless landscapes into site-appropriately performative, productive and at the same time beautiful and useable urban systems.
Bugs, Prairie Dogs, and Tranquility: Why Stapleton Residents Love Stormwater Parks

Jessica Canfield, Kansas State University, United States, jesscan@ksu.edu
Huston Gibson, Kansas State University, United States, hgibson@ksu.edu

Keywords: stormwater parks, infrastructure, multi-functional, preference, Stapleton

The past few decades have seen a fervent outpouring in the design and implementation of innovative stormwater management systems. This emerging trend, in part, can be attributed to increased demands for multi-functional urban landscapes, as well as greater recognition that stormwater infrastructure, when designed and engineered with utility and amenity in mind, can have added community values such as aesthetics, recreation, and wildlife (Echols & Pennypacker, 2008; Meyer, 2008; Stahre, 2008).

Stapleton, located in Denver, Colorado, has incorporated innovative stormwater management into many of its community parks, capitalizing on sites’ inherent topography, drainage patterns, and high Plains ecosystem character. In pairing open-air stormwater infrastructures with native/naturalized vegetation, critical habitat, and passive recreation amenities, Stapleton’s stormwater parks are distinctly different, aesthetically and functionally, from its non-stormwater parks. Being that Stapleton’s stormwater parks are an atypical urban park typology, we set out to discover residents’ perceptions and use habits for these parks.

To first assess residents’ perceptions, surveys were mailed to approximately one quarter (1000) of all Stapleton households in May 2011. Using a likert-type scale and open-ended questions, residents evaluated the scenic qualities, safety, and usability of Stapleton’s parks. 263 completed surveys were returned. To understand the nuances behind these findings, in May 2012 we held walking interview/focus-group sessions with residents in the parks surveyed. This presentation will discuss the findings from our survey and walking interviews, revealing what residents think of their stormwater parks. By understanding user preference of stormwater parks, we are able to better plan and design future communities which coalesce infrastructural requirements with natural systems and amenity.
Bukit Brown Cemetery Landscape Scenario

Yun Hye Hwang, National University of Singapore, Singapore, akiyhh@nus.edu.sg

Keywords: Built environment, Diverse habitats, Environmental impact, Site Specificity

90% of Singapore consists of built environment, whereas only 5% of its land is regarded as primary forest. Situated in the southern patch of the forest, Bukit Brown Cemetery is one of the few undeveloped area which is full of memories and more importantly, diverse habitats. However, the ongoing development plan states that a dual four-lane expressway will cut through a 200ha-sized site in the near future. The long term plan shows that the site will eventually become a new housing district for 50,000 residents in 30 years time. It is obvious that the new development plan will significantly threaten the current rich ecology of the land.

How then could landscape architects balance between the increasing built environment and decreasing nature? When urban redevelopment happens in a land-scarce city, how do we guide our environment towards a more ecologically sustainable direction? Would we work as a convincing mediator by assessing the environmental impact of the site? The project aims to answer these questions by research associated with multiple issues of identity, connectivity, and livability.

Site specificity is the fundamental research methodology for the project since its feasibility can only be realized through intensive field research. The paper contains the full range of research processes at a variety of scales, describing layers such as its context (urban & nature), its depth (history & socio economic considerations), and its flows (ecology & system). The site characteristics would be revalued through various mappings and analytical visualizations. Consequently, the project highlights how actively these intensive research data interweave and integrate with the actual site proposal.

With understanding of both nature and human’s need, the Bukit Brown Cemetery Landscape Scenario hopes to generate basic guideline towards our ecological and social responsibility in the field of landscape architecture.

Shimon Zimbovsky, University of Illinois at Urbana-Champaign, United States, szimbov2@illinois.edu
William Sullivan, University of Illinois at Urbana Champaign, United States, wcsulliv@illinois.edu

Keywords: children's play environments, nature-based play, social / cognitive development, qualitative research

Play is the work of children. Play facilitates social skills and pro-social behavior (Taylor, 1998). Dramatic play is associated with sustained attention, memory and logical reasoning (Berk, 2006) and explorative play has been shown to positively impact experimentation and problem solving techniques in children (Barnett, 1976). We see that play is vital, however the environment also plays an important role. With respect to the environment, children simply prefer to play in vegetated settings (Taylor, 1998). Green spaces also enhance attentional capacity and levels of vegetation are related to behavior disorders, anxiety and depression in children (Spencer, 2011). However, 61% of children between 3-5 years old spend the majority of their day in daycare centers, which commonly lack considerable vegetation (Raver, 2002). Nature-based play environments respond to the growing need for vegetation in children’s playgrounds. These playgrounds promote physical activity, creativity, exploration and cooperative behavior through play elements and materials based on highly vegetated natural settings.

Considerable evidence demonstrates that the 3-5 year age group is a critical developmental period during which vital physical behavior patterns are established (Sugiyama, 2012). Thus, playgrounds are important settings for facilitating developmentally vital play. However, since the majority of children in this age group spend their days in childcare centers with playgrounds commonly lacking in vegetation and natural play elements, are these children exposed to the full range of critical play activities vital to healthy social and cognitive development?

This paper discusses recent findings from a study in which we conducted a series of observations of 3-5 year-old children in nature-based play environments and traditional playgrounds considerably lacking in vegetation. Our observations were based on the Rubin Play Observation Scale and coded children’s social and cognitive play patterns as well as negative non-play behaviors. In addition, we administered a 22-question survey to caregivers at participating daycare facilities containing the nature-based and traditional playgrounds. The surveys asked caregivers to respond to questions regarding children’s spatial preferences as well as rate how their respective playgrounds perform with respect to the social, cognitive and non-play measures of the Play Observation Scale. Our findings indicate a greater incidence of higher order social play and less instances of non-play behaviors in nature-based playgrounds.

This paper’s contribution is to measure the specific social and cognitive benefits associated with nature-based playgrounds and the extent to which these settings impact children’s development relative to traditional playgrounds with fixed equipment.
City Parks and Cities: A Demographics Impact Model for Park-Related Expenditure

Lanbin Ren, University of Oregon, United States, lren@uoregon.edu  
Mark Gillem, University of Oregon, United States, mark@uoregon.edu

Keywords: City park, expenditure, demographics, impact

Many studies have shown that city parks provide a variety of environmental, social and economic benefits. Originally the city parks were considered as the way to contact nature as gifts from people to themselves. City parks are also popular destinations for people’s gathering, recreation and special social events. In recent decades, there is an emerging view of city parks as an economic engine of city development. However, there is very little existing information about how cities make budgets for park-related expenditures. This research discusses the relationships between city demographics and cities’ park-related expenditure which will help decision makers better understand the roles of city parks. In this research, data is collected from the annual park survey 2001-2011 released by Center for City Park Excellence. Dependent variable is park-related expenditure per resident includes expenditure on grounds and facilities maintenance and repair, expenditure on recreational programming and activities, and expenditure on construction, acquisition or other capital activities in that fiscal year. Independent variables of city demographics include population density, city size and average income per household. The operational model of this research is a combination of logistic regression and fixed effect models.

Results and findings are discussed in three demographic categories: high, medium, and low population density cities. The effect of political power and park policies in park-related expenditure are also briefly discussed.
Combating Obesity with Mud Pies and Tree Cookies: A Case Study of Three Natural Play Spaces in Northwest Minnesota

Eric Castle, University of Minnesota Crookston, United States, castl047@umn.edu
Daniel Handeen, University of Minnesota, United States, hande020@umn.edu
Sarah Reese, Polk County Public Health, United States, SReese@co.polk.mn.us
Virajita Singh, University of Minnesota, United States, singh023@umn.edu

Keywords: natural play space obesity social capital

With rising obesity rates community health is suffering, human connections to nature are dwindling, and social capital is in decline. A growing body of research highlights the positive connections between human health and relationships with natural places. Early public parks capitalized on the provided benefits to community health and some argue that urban planning and public health policy have since diverged. Given that parks provide opportunities to improve physical, mental, spiritual, social, and environmental health, reevaluation of the relationship between community health and parks should be a revitalized component of community dialog (Maller et al. 2002). Of particular interest to public health officials is the epidemic of childhood obesity. From 1995 to 2010 Minnesota’s obesity rate increased from 14.6% to 25.3%, ranking in at the 38th most obese state (U.S. Census 2010). In Northwest Minnesota, 52% of 9th grade students are reported overweight or obese, compared to the state percentage of 46% (Minnesota Student Survey 2010). Natural play spaces are reemerging as a method for engaging children to improve health through physical activity and provide opportunities for less structured free play with natural materials in outdoor environments.

In 2010 public health officials, researchers and concerned citizen set out to design and implement natural play spaces in communities throughout Northwest Minnesota with a short-term goal of promoting an increased sense of community ownership and a long-term goal of promoting healthy, active lifestyles to curb disparate obesity rates. This case study examines the collaborative process between academic, local government, and community stakeholders in the planning, design and implementation of three natural play spaces in rural Northwest Minnesota and evaluates the ability of these types of spaces to foster social capital and provide a setting to improve community health through reconnecting people with nature.
Cow Country: Parsing the Global in the Local Beef Landscape

Denise-Hoffman Brandt, The City College of New York, United States, hoffmanbrandt@nyc.rr.com

Keywords: food systems. global, western landscape

Landscapes are the physical manifestation of social forces, not simply through being the arena for functional organization and economic operations, but as the “face” of the polity, “a reflection of the political landscape.” This paper examines the complexity of reading the nuances of polity in landscapes animated by global corporate flows through looking at the landscape of industrial farming, malls and sub-divisions in Greeley and Loveland, Colorado. In the past fifty years, the area around Greeley and Loveland Colorado has transformed from an agricultural center characterized by family-owned farms and processing plants (Montfort) sustained by federally-financed water projects, to a regional economy dominated by American global corporations (Swift/ConAgra/Loveland Products), to the home of a Brazilian-owned and managed global beef conglomerate (JBS SA). All supported by the aforementioned international chemical producers and water subsidies. Under both the American and Brazilian corporate flags, the industrial agricultural landscape overlays the aesthetics of the suburbs – built into domestic and employee service areas – onto the operations of an industrial agricultural terrain.

Project photo-documentary and map research explores the physical terrain of the production processes of the beef industry in the complex political terrain of Greeley and Loveland, Colorado: tilling, watering, propagation for feedstock, as well as feeding, cutting/packing, distribution, management/marketing and local/food retail. The in-depth examination of the production cycles animating the region are the basis for considering whether or not there is any discernible difference between the “face” of the American global corporate realm and that of the extra-national Brazilian corporate territory. Landscape architects work in these increasingly complex global-local territories, to design responsibly will necessitate development of an expanded repertoire of tactics for “reading” their overt and covert operations. Questions for consideration include: how does the landscape of beef reflect a local context driven by American ideas of the western landscape, and how do global economies co-opt images of the western landscape to obscure the scope and scale of their operations.
Cultural Landscapes Under Climate Change

Elizabeth Brabec, University of Massachusetts Amherst, United States, ebrabec@larp.umass.edu
Elizabeth Chilton, University of Massachusetts Amherst, United States, echilton@anthro.umass.edu

Keywords: climate change, place attachment, cultural heritage, cultural landscape

Around the globe, the impacts of climate change are increasing the risk of catastrophic events and the resulting loss of human life and communities. To date, responses to these events, and planning for future occurrences, have focused on the ecological and social impacts, to the almost total exclusion of the impacts on heritage.

Cultural landscapes are a physical form of cultural heritage, and include archaeological sites, historic buildings, and artifacts, but—most importantly—the meanings, values, and contemporary social behavior associated with these tangible forms of heritage. Thus, place attachment, sense of place, and its associated forms of intangible heritage are major factors that must be integrated into climate change adaptation and risk management models. In this paper we call for the recognition that cultural landscapes play in our communities, and the effect that climate change will have on them, thus arguing for their inclusion in the process of planning for the critical and slow-onset disaster mitigation that will face communities under conditions of climate change. Communities, towns, and governments typically disassociate cultural/historical resources from natural resources in issues of planning and development. Likewise, in the academy the fields of history and archaeology are not only segregated from each other, but they are often further separated from ecology and regional planning. What is needed is a transdisciplinary approach to cultural heritage in risk management, and the overwhelming impacts that climate change will have on the landscapes within which people live.

There is critical need for this approach, since climate change will result in accelerated changes for human communities—from dislocation to a change in the physical manifestations of place. As ecosystems shift, impacts will be seen across a wide range of scales, from the mega-region to the local site. The resulting dislocation and social change has the potential to destabilize society, and finding ways to mitigate that outcome is critical. In this paper we explore both theoretical and methodological approaches to disaster and climate change adaptation through the lens of cultural heritage using two cases studies: (1) the Gullah Community of South Carolina, U.S.; and (2) the diverse heritage communities of Eleuthera, Bahamas. The case studies serve as a vehicle to vet theoretical policy changes and their potential on-the-ground impacts as we rationalize the role of heritage in disaster management.
Defining Successful Elements of Community Gardens in Small U.S. Towns

Meghan Schultz, Mississippi State University, United States, mcschultz85@gmail.com
Cory Gallo, Mississippi State University, United States, cgallo@lalc.msstate.edu

Keywords: community, gardens, local, agriculture

The success and social benefits of community gardens in large cities has been well documented in literature, but how do the positive aspects of a community garden translate to a smaller and more rural community? The merit of a community garden is in the building of relationships within a community and harvesting positive fruits from the labor involved, benefits, which are needed in communities of all shapes and sizes. Learning the social capital and personal benefits community gardens offer for the users and surrounding community in small cities was goal of this study.

This study questioned over 200 community garden leaders located in towns with populations less than 40,000 what makes their gardens successful. A web-based survey was used to ask questions about their garden’s leadership, members, operation, and community context. The survey also asked a series of open-ended questions, which provided further insight into the garden’s specific operation. Responses to the survey were positive and painted a clear picture of the setup and operation of each garden project.

Preliminary results indicate trends, which are most common of these types of community gardens including organizational structure, management, property ownership, and age of community gardens. Additional trends were observed which indicate the differences between towns with and without colleges or universities where the education level and life experiences of the users may influence the perspectives on community gardens as well as the effectiveness of its practices.

This study will be able to help guide other small towns looking to start a community garden determine which strategies may be most appropriate. It also points to the need for future research on the implications of how the physical location, design of the gardens, and experience of users influences its rate of success.
Design Elements and Applications to Solving Obesity: The Behavioral Responses in the University of Georgia Lunchscapes

Pongsakorn Suppakitpaisarn, University of Georgia, United States, psuppak@gmail.com  
Sungkyung Lee, University of Georgia, United States, sklee@uga.edu

Keywords: landscape, obesity, eating, health, built environment, psychology, attention-restoration theory, environmental psychology

Obesity is an epidemic. Scientists have proven that chronic stress and built environment are the cause of obesity as much as food consumption. ‘Natural Deficit Disorder’ by Richard Louv points out the problem from the lack of exposure to nature in our daily life by illustrating a strong correlation between the built environment and obesity. Drawing on the existing empirical research of the restorative benefits of the exposure to natural settings in reducing stress, restoring attention capacity, and reducing obesogenic hormones, this research tries to illustrate positive/negative obesogenic design elements and features found on university campus. Among various settings on campus, this research focuses on outdoor lunch spaces commonly used by students and investigates the relationship between nature/ lack of nature and behavioral responses related to healthy/unhealthy eating behaviors. University campus can be a very stressful environment for students, faculty members, and staffs with busy schedules that prohibit people from taking a break or restorative natural exposure. This research investigates the use of outdoor settings on UGA campus using lunch break because lunch break provides the opportunity for daily natural exposure. First, the study will examine common outdoor spaces used by students during lunchtime on the University of Georgia campus and categorize them based on the extent of natural elements present in the space. Each environmental setting will be observed on the use by students and analyzed based on the degree of interactions with natural design elements. Findings from this study will build on the existing studies and guidelines on outdoor campus design with an emphasis on natural elements. The result may reciprocate the design elements proposed by Claire Cooper Marcus’s study on campus design or bring attention to different environment settings that are suited to accommodate students heavily dependent on electronic devises. For most people in the urban setting who have strict hours of work, the opportunity to be exposed to the green environment daily is important to retain health. The design of spaces that allow human interaction with nature will have to be further researched. This study will create a stronger potential for future studies to utilize a relationship between built environment and human health.
Developing a Shorter Version of the Irvine-Minnesota Inventory for Youth

Mallika Bose, Pennsylvania State University, United States, mub13@psu.edu

Keywords: built environment and public health; instrument development; environmental audit

Background and Purpose
The prevalence of obesity in this country has been recognized as a public health issue requiring timely attention. It has prompted researchers to focus attention on factors that are causally linked to obesity and chronic diseases associated with obesity. This line of research has lead to the recognition of the important role played by the built environment in advancing health-promoting behavior. Research has resulted in the development of (environmental) audit tools to assess built environment factors related to physical activity - especially moderate physical activity like walking. One such instrument is the Irvine-Minnesota Inventory (IMI). The IMI consists of 162 items organized into four domains: accessibility (62 items), pleasurability (56 items), perceived safety from traffic (31 items) and perceived safety from crime (15 items). It comprehensiveness is at once its strength and weakness. The length of this instrument makes its use very resources intensive. Moreover, recent research using this study illustrates that many items in this audit are not related to physical activity. This study uses a data driven approach to reduce the IMI and develop a shorter version (referred to as IMI-S) of it particularly suited to youth.

Method
The original IMI was used to collect data from two inner city low-income neighborhoods (111 segments in Neighborhood 1 and 122 segments in Neighborhood 2) in Harrisburg Pennsylvania by five pairs of trained raters. Principal components analysis was used as a data reduction strategy to develop the reduced IMI-S. Focus groups were conducted with youth to discuss the relevance of items included in IMI-S.

Findings
The end product of the principal components analysis is a shorter version of the IMI, consisting of the four original domains: accessibility – 16 items; pleasurability – 10 items, perceived safety from traffic – 16 items; and perceived safety from crime – 4 items. The items in IMI-S resonated with the youth in the focus groups, though it was evident that different weights were given to different items included in IMI-S. The end product is a shorter version of IMI with some suggestions for weighting of the different items.

As a next step, the construct validity of IMI-S needs to be tested with physical activity (especially walking) data from youth.
Do People Understand Infiltration Along Urban Streets? – A Comparative Survey of Infiltration Systems and Their Aesthetic Values

Frank Sleegers, University of Massachusetts, United States, sleegers@larp.umass.edu
Elizabeth Brabec, University of Massachusetts, United States, ebrabec@larp.umass.edu

Keywords: green infrastructure, stormwater, landscape aesthetics, urban stormwater management, landscape design evaluation, environment

In the past decade, numerous infiltration systems have been implemented along urban streets to reduce the impact of runoff on urban watersheds. Most of them are designed to respond to functional challenges without regard to design aesthetics. However, public acceptance and value of these systems is key to their long term sustainability and the support of public investment into their maintenance. While high aesthetic value is important, little empirical research has been done in this area. A previous study by the authors evaluated the aesthetics of infiltration systems along urban streets as a design-based expert approach and investigated the attributes of unity, complexity, legibility, mystery, spaciousness and naturalness in two case study projects. The findings demonstrated that the design of infiltration systems has unrealized potential to engage aesthetic values through the use of basic design principles - especially the enhanced legibility of infiltration.

This lack of legibility of the design intent identifies the questions for this study: do people understand the function of infiltration systems along urban streets and the importance of legibility of a landscape’s ecological functions? Does the legibility influence their perception in a positive or negative way?

Using the three cases studies of Seattle High Point (WA), Hannover Kronsberg (Germany) and Freiburg Vaubon (Germany), we investigated these questions. Using a survey and open ended-interview techniques, people on the streets of the respective case study locations were asked to participate in the questionnaire. These findings were generated:

1. The beauty of streets is very important and affects the reputation of a whole neighborhood. e.g. trees and specifically old trees that have been saved during development are considered to have high aesthetic value.
2. People that know about the function of infiltration systems value them more highly than people who do not know.
3. Involvement in the process of designing the neighborhood increases appreciation and value.
4. Impediments created by the infiltration systems, e.g. standing water, that impede daily functions diminish the aesthetic value.
5. Low maintenance is perceived either as naturalness or neglect.
6. People who garden regularly have a stronger affection for and awareness of infiltration systems.
7. Standing water in an infiltration system is perceived negatively; flowing water evokes neutral to positive responses.

One finding was common to all of the case studies: a focus on ecological principles in the design of the housing developments creates a high sense of identity that affected the positive perception of the landscape.
Doing Time in this Place | Mother-Child Gardening Programs in Prison

Julie Stevens, Iowa State University, United States, jstevens@iastate.edu

Keywords: Prison Mother-Child Garden Therapy

This study explores scenarios for employing the prison landscape as a therapeutic space where incarcerated women can build stronger relationships with their children, thereby decreasing recidivism rates. The Iowa Correctional Institute for Women is currently undergoing a $68 million dollar expansion project. The Iowa Department of Corrections is committed to making this a state-of-the-art facility dedicated to transcending confinement and to developing innovative therapeutic programs.

The women on the inside are not the only population to consider, there are currently 2.3 million invisible victims in the United States due to increasing rates of incarceration. When a father is sentenced to prison, the primary care giver is usually the mother, in contrast, when a mother is sent to prison, the child is often placed in alternative care situations. This pattern has serious consequences, 70% of small children have psychological issues while a parent is incarcerated and 50% of school-aged children experience poor grades, aggression and strained relationships. While men makeup the majority of incarcerated persons in the U.S., 58% of incarcerated women are mothers and nearly half of their children will follow them into a life of crime and corrections.

Research shows that there are two primary ways to decrease recidivism rates amongst female populations: provide educational and vocational training, and improve mother-child relationships. A gardening program can provide vocational and life skills while fostering healthy familial relationships. Many incarcerated women express having a difficult time making connections with their children while they are in prison. They are unsure how to communicate and need an outlet for building this critical relationship. When familial connections are damaged or severed, a woman is less successful in therapeutic programs therefore, regular visits with ones family and children are particularly critical. Family members, particularly children, need a safe and comfortable place to visit or they will not return.

A gardening program would foster a sense of pride and accomplishment while providing the mother and child with a topic to discuss and share. The new administration building at ICIW includes an outdoor courtyard for visitors, a feature absent from the current campus. The design, however, is not conducive to outdoor activities or personal conversations between offenders and their loved ones. This courtyard space can be expanded to provide opportunities for mother-child gardening programs that foster reform and break the cycle of incarceration.
Dumping on Dixie "Is Public Participation Needed in the Landfill Creation Process"

Kenneth (Dale) Speetjens, Auburn University, United States, kds0025@auburn.edu  
Charlene LeBleu, Auburn University, United States, leblecm@auburn.edu

Keywords: Landfills, Public Participation, Moratorium

Current laws within the state of Alabama allow for the creation of landfills without much public input or knowledge. This lack of public participation has affected several communities in the state including Sumter and Conecuh Counties. This situation has led to the creation of waste sites that accept discarded material from other states, and have the potential to pollute both the aquatic and terrestrial environment of Alabama. Through an examination of academic articles, case study analysis, and other related literature, this paper addresses the current state of affairs in the Alabama system regarding the creation of landfills.

The state of Alabama is becoming a popular place for the nation’s mounting waste problems. With the lowest dumping fees per ton of any state in the continental United States, Alabama is receiving five times more trash than it generates annually (Raines, 2010). Alabama currently permits nine landfills that accept trash from multiple states. Much of the decision making process about the formation of landfills is left up to local governments that often place short-term monetary gains over the environmental and community health. Citizens claim a lack of public participation and lack of transparency by public officials has spurred this controversy. With a two-year moratorium on the formation of landfills in the state, Governor Robert Bentley has made the first step to reevaluate the current landfill process.

Main findings report that Alabama’s large landfills are located in rural and/ or low income communities of where the majority of citizens are African Americans. This is problematic because of the low land value in the community, or because some companies view rural inhabitants as being undereducated, either way the people of Alabama are being targeted.

The permitting process is also found to be lacking. With little oversight from the state or regional planning commission, the decision is left up primarily to local community leaders. The current permitting process offers few checks or balances. Furthermore, the manner in which the public is notified about the proposed landfill does not reach a large section of the public. Perhaps the most troubling issue surrounding the permitting process of landfills in the state of Alabama occurs when a city or county does not vote on the landfill within ninety days, leading to an automatic approval.
Effects of Landscape on Psychological Response and Brain Region Activity

Ying-Ju Lin, National Taiwan University, Taiwan, b94612026@ntu.edu.tw
Chun-Yen Chang, National Taiwan University, Taiwan, cycmail@ntu.edu.tw

Keywords: landscape benefits, functional magnetic resonance imaging, attention restoration theory, restorative environments, restorative experience

Many studies have shown that people prefer natural environment than urban environment, and exposure to the natural environment can restore attention from fatigue. Most of these studies used indirect measurements such as scales or biofeedback data. Seldom was direct evidence obtained. With the development of functional magnetic resonance imaging method, observation of the activation of brain regions helps us to understand further of psychological reactions and behavior. Therefore, the purpose of this study is to understand brain region activity when viewing different landscapes using questionnaire and fMRI. Perception of landscape was measured with questionnaire constructing of restorative experience and perceived restorativeness. Brain region activity was tested by fMRI. The current study was divided into two parts. First, four types of landscapes, which include city, mountain, forest, and water body, were used to test perceptions toward them. As the second part, four restorative environmental characteristics based on Attention Restoration Theory were tested. The results showed that viewing pictures of urban landscape had lower perception of attention restoration than nature while viewing forests had lower attention restoration than mountains and water bodies. Furthermore, brain region activity showed that right superior parietal lobe was activated while viewing city pictures. Moreover, only two brain regions related to visual reaction activated while viewing mountains and water bodies. On the other hand, Coherence of environment showed lowest possibility of restorative experience among the four restorative characteristics. There were no significant differences on restoration among Being Away, Fascination, and Compatibility. However, Compatibility had slightly higher attention restoration than the other three. Brain region activity, however, showed that the brain region activities related to visual reaction were all active with the four specified environments. Notably, lots of brain regions on frontal and parietal lobe were activated while viewing fascination environment. Frontal and parietal lobes are considered to direct high-level cognitive system and may consume resources highly. Right superior parietal lobe relates to top-down attention and may possibly relate to the directed attention. In conclusion, natural environment seems to have more attention restoration effect than urban environment while mountain and water effect better than forest in both perception measurement and brain region activity. Further studies into the effectiveness of the perception mechanism are necessary. These works could help to confirm the importance of the relationship between human and environment.
Engineered Ecologies of the Pearl River Delta

Dorothy Tang, University of Hong Kong, Hong Kong, dstang@hku.hk

Keywords: China, Hong Kong, Engineering, Hydrology, Urbanization

The Pearl River Delta (PRD) region is one of the densest urban areas of the world with a complex hydrological system that blurs, stretches, and redefines the traditionally binary relationships between artificial and natural. Engineered processes such as land reclamation, dredging, and aquaculture have altered the natural cycles of erosion and sedimentation, salinity levels, and ultimately the ecological systems of the delta.

This study examines the interdependency between human settlements and biophysical systems of the Pearl River Delta beginning from the Southern Song Dynasty (1127-1279 AD) to the present day through historical maps, original Chinese texts, and GIS data. This information is compiled through a series of scaled drawings that reveal continuously shifting ecologies that are as natural as they are artificial.

These unique relationships are illustrated through three case studies that document environmental change over the past millennia. First, land use changes during the political unrest of the Southern Song Dynasty initiated large-scale shifts in natural sedimentation cycles that naturally expanded habitable areas of the PRD. Contemporary land reclamation is constructed with dredged sand from the upper reaches of the Pearl River, further modifying its hydrological conditions. Second, flood protection infrastructure in the PRD change the salinity levels of the estuary and aquaculture practices move south of the delta to maintain productivity. Oyster farming, particularly, is sensitive to fluctuating salinity of the delta, and leaves unique architectural and landscapes remnants in its wake. Lastly, the change in political regimes in 1949 once again moves population south to Hong Kong where migrant shrimp farmers build tidal shrimp ponds (Gei Wai’s) that ultimately become a crucial RAMSAR site along the East Asia-Australasian Flyway.

These case studies demonstrate the inseparable relationship between human beings and the environment. Each modifies the other and eventually collaborate for productive ecologies that are engineered and natural simultaneously.
Enhance Health of Pre-school Children Through Prolonged Engagement on Playgrounds

David Watts, Cal Poly San Luis Obispo, United States, djwatts@calpoly.edu

Keywords: play, children, health,

Obesity has become a major issue concerning children’s health today, but another issue has arisen. Over 70% of children in the United States have insufficient levels of vitamin D. This deficiency can lead to rickets, osteoporosis, cardiovascular disease, and a host of other chronic ailments (Kumar et al, 2009, Reis et al, 2009). To maintain a healthy level of vitamin D requires 10-15 consecutive minutes of exposure to the sun twice a week (Brender, Burke, Glass, 2005). The barriers to children not being outside or having a limited range of play space have shifted over time from physical attributes to social ones. Reasons that children are not spending time outdoors include an increase in supervised activities, technology, and parental fear (Clements, 2004, Pyle, 2002).

Research was undertaken at the Preschool Laboratory at Cal Poly in San Luis Obispo to discern if an enriched play environment would engage children for longer periods of time. Research indicates that when preschoolers play, they have brief spurts of activity punctuated by rest periods (Bailey et.al, 1995). Does the design of the playground influence the duration of each of these and does it influence the overall duration of their engagement of play outside? This longitudinal study examines the play patterns of children when nature-based play opportunities supersede traditional playground equipment. The existing pre-school playground is a rectangular space bisected into two relatively equal spaces by a concrete sidewalk, and is surrounded by a masonry block wall. One half is a flat open lawn with a climbing structure and two large magnolia trees, and the other is a concrete slab with minimal traditional playground equipment, and a perimeter walkway defined by five foot wide planters. Children were observed in play for the fall quarter in this space with two video cameras positioned to record the largest area possible. Following this, a donor afforded the opportunity to redesign and construct a new nature based playground experience. I created a new design, which was constructed the following year and children were observed again during the fall quarter utilizing the same protocol measures. Initial analysis of the data from the original playground shows a limited number of children engaged in outdoor play. It also confirms results from the Bailey study, and additionally sheds light on play preferences exhibited by the children.
Environmental Correlates of Health-related Quality of Life in Hispanic Children

Jeongjae Yoon, Texas A&M University, United States, yjj2324@neo.tamu.edu
Chanam Lee, Texas A&M University, United States, chanam@tamu.edu
Jun-Hyun Kim, Texas A&M University, United States, JHKim@arch.tamu.edu

Keywords: Health-related quality of life; obesity; built environment; Hispanic; children; environmental perception

Health-related quality of life (HRQOL), as a status of physical and mental well-being, is an important health outcome that can benefit from having supportive environments. However, there are few empirical studies addressing the role of built environments in promoting HRQOL. Further, minority children tend to have lower levels of HRQOL and be at higher risks for developing many other health problems. Therefore, identifying attributes of the built environment that nurture good health especially among the high-risk groups is an important area awaiting more empirical studies. This paper is to identify significant environmental correlates of Hispanic children’s HRQOL, captured using the Pediatric Quality of Life Inventory (PedsQL) developed by James Varni.

Ninety-two Hispanic children in the third to fifth grades and 95 mothers were recruited in 2009 from five elementary schools located in the East End district of Houston, TX. They completed surveys measuring: (a) children’s HRQOL captured with PedsQL’s child self-reports and parental proxy reports, (b) children’s perceptions of neighborhood environments covering five constructs of accessibility, attractiveness, safety, comfort and convenience, and neighborhood satisfaction, and (c) socio-demographic factors of the children and their family/household. The outcome variable for this study was the total mean PedsQL scores, ranged from 0 to 100 with higher scores indicating better HRQOL. Latent factors were extracted from the environmental perception variables. Two multivariate linear regression models were estimated to identify significant (p<0.1) correlates of both self-reported and proxy-reported PedsQL scores.

After controlling socio-demographic factors, children’s self-reported PedsQL scores were positively associated with walkability to play spaces (e.g. playgrounds, parks, streets), and the presence of attractive views (e.g. attractive building, gardens, natural features, parks), while negatively correlated with safety concerns against exhaust fumes, strange smells, noise, or injury risks while walking/biking, and encounter with wildlife (e.g. sounds of nature, encounters with birds, squirrels, rabbits). Results from the mothers’ proxy-reported PedsQL scores showed that the presence of pharmacy and religious institutions were positive correlates, while the presence of service facilities (e.g. laundries, post offices, libraries, banks) and safety concerns against strangers or gangs were negative correlates.

Children’s HRQOL was associated with perceptions of neighborhood environments encompassing safety issues, walkability to play places, and attractiveness. These findings suggest that physical and mental well-being of children can be enhanced by supportive neighborhood designs featuring safe streets, attractive buildings, and accessible recreational and play amenities.
Establishing A Dose-Response Curve for The Impact of Community Forests on Recovery from Acute Stress

Bin Jiang, University of Illinois at Urbana-Champaign, United States, jiang25@illinois.edu
William C. Sullivan, University of Illinois at Urbana-Champaign, United States, wcsulliv@illinois.edu

Keywords: Saliva Cortisol, Dose of Nature, Community Forests, Trier Social Stress Test, Acute Stress

Although it is well established that exposure to urban forests can help reduce stress in individuals, the shape of the dose-response curve is entirely unclear. We do not know if a small amount of nature is enough to induce calming effects, whether or not increases in the density of canopy cover produce additional calming effects, or even if the relationship is linear. Lack of this knowledge prevents landscape architects from making science-based design and management decisions that might improve the health and longevity of people in the communities they serve.

Our hypothesis is that moderate increases in exposure to urban forests result in measurable reductions in stress as measured by salivary cortisol. The release of cortisol is regulated by hypothalamic-pituitary-adrenocortical (HPA) axis. Hundreds of studies have demonstrated that psychological stress is accompanied by increased HPA activity that pumps cortisol into the blood stream. This cortisol is detectible in saliva. We recruited 160 healthy adult participants for this study. Each participant first sat quietly for five minutes, then engaged in a standard Trier Social Stress Test (TSST) to induce psychological stress. Participants were then randomly assigned to watch one of ten, three-dimensional videos of street scenes that varied with respect to the percentage of tree canopy along the street (ranging from 2% to 62%). Three saliva samples were collected from each individual in order to measure cortisol levels at the end of the rest period, at the end of the TSST, and at the end of the video.

What is the shape of the dose-response curve? Results of polynomial analysis indicate a significant quadratic relationship between percent tree canopy and recovery from acute stress(r2=04, df=148, p<0.05). As canopy cover increased from 2% to 40%, there was a significant reduction in cortisol levels between the end of the stress test and at the end of the video. Additional increase in canopy cover after 40%, however, yielded a significant increase in cortisol level between the two times.

For centuries, philosophers, poets, and artists have suggested that people can reduce the stress they feel by escaping to nature. Emerson, Whitman, and Thoreau all wrote about the sense of peace and tranquility that comes with being in nature. These results are the first empirical evidence that describe a dose-response curve for the impact of community forests on the levels of stress. These findings should be of significant interest to practitioners, policymakers, and public health officials.
Healing the Invisible Wounds of War: Therapeutic Landscapes for Wounded Warriors Suffering from Post Traumatic Stress Disorder (PTSD)

Sarah Ashmun, University of Maryland, United States, capps.sarah@gmail.com  
Jack Sullivan, University of Maryland, United States, Jack@umd.edu  
Victoria Chanse, University of Maryland, United States, vchanse@umd.edu  
Nicholas Watkins, HOK, nick.watkins@hok.com

Keywords: Therapeutic, Landscape Design, PTSD, Wounded Warriors

At some point in their lifetime, approximately seven percent of Americans experience posttraumatic stress disorder (PTSD)(Kessler 2005). Many of these individuals are war veterans. Characterized by pervasive symptoms of intrusion, numbing, and hyperarousal, coping with PTSD can be a tenacious and lifelong challenge for sufferers(Cahill and Foa 2010). Given the recent surge of war veterans resulting from Operations Enduring and Iraqi Freedom with a high prevalence of PTSD, landscapes may provide a free and accessible means for veterans to successfully cope with their PTSD symptoms and seek treatment. Yet, while the role of therapeutic environments in alleviating stress is well-documented, little is known about how landscape design functions as a therapeutic tool for specific mental disorders and diseases (Ulrich 2003; and Cooper Marcus and Barnes 1999). What limited design research there is on how landscapes function as therapeutic modality for PTSD does not focus on healthcare settings (Watkins, 2010). To date, most hospital designs for psychiatric care facilities have more often than not, failed to directly consider the link between patients with mental illness and outdoor environments (Cooper Marcus and Barnes 1999).

This project explores the potential for landscape design strategies and elements to address the needs of wounded warriors suffering from PTSD. This project’s intention is to translate successful therapies for PTSD into landscape design. Methods used include precedent studies, an examination of symptoms and challenges associated with PTSD and the therapies used to treat it. A series of campus and woodland environments at Walter Reed in Bethesda, Maryland will incorporate successful holistic therapies used to treat PTSD as part of the programmatic framework.
Hospitals and Immigrants: Revitalizing/Replacing the Gateway Neighborhood

Susan Dieterlen, State University of New York, United States, sdieterl@esf.edu

Keywords: sociocultural issues, revitalization, gentrification

In cities that have suffered from the decline of manufacturing, the Great Recession merely deepened existing trends of decline and disinvestment. The challenges facing these postindustrial places are well documented, but recent work focuses on the conditions facing smaller cities (Tumber 2011). Within this context, neighborhood revitalization and gentrification may appear as a savior, but the potential displacement of lower income residents is an important though controversial concern (Freeman and Bracconi 2004). This is particularly true where vulnerable communities surround growing anchor institutions, the spatial impact of which has generally been understudied (Bostic, Lewis, and Sloane 2006).

This research profiles two immigrant gateway neighborhoods also home to growing hospitals, comparing them to identify similarities and differences. These neighborhoods are situated in Lansing, Michigan, and Syracuse, New York, postindustrial cities of 100,000 to 150,000 residents. Case studies of each neighborhood focus on built environment, economic, and demographic characteristics, with analysis focusing on similarities and differences. Findings indicate that despite many similarities, levels of gentrification and displacement differ, associated with differences in revitalization strategies and the cultivation of a distinct neighborhood identity within the context of the larger city. The overall economic health of the city also appears to play a role, with gentrification more likely where the city’s overall economic picture is more positive.

These findings provide lessons for other places where new development, desirable for the postindustrial city as a whole, impacts immigrant neighborhoods, especially those with newly arrived immigrants. Given the high stakes for economic revitalization and catalysts in the current economic climate, cities such as these require the contribution of all constituencies to move forward. Neither the power of anchor institutions nor the energy of immigrant communities can afford to be squandered. This research seeks ways for them to work in tandem toward a bright inclusive future.
Human Health and Well-Being Benefits of Urban Greening: The Scientific Basis for Emerging Landscape Design Norms

Theodore Eisenman, University of Pennsylvania, United States, etheo@design.upenn.edu
Tom Daniels, University of Pennsylvania, United States, thomasld@design.upenn.edu

Keywords: Urban Greening, Health and Well-being, Ecosystem Services, Design, Livability

Municipalities in the United States and around the world are showing an increasing interest in urban greening (Beatley 2011; Young 2011). From Lagos to Los Angeles, cities are promoting tree-planting initiatives. Seoul and Toronto are leading a wave of new municipal policies promoting green roofs. Berlin and Seattle have established green area ratios, innovative regulations that establish the minimum proportion of a site required to contain vegetated features (Keeley 2011). Community gardens are likewise on the rise (Draper and Freedman 2010). Underlying these initiatives is a long-held belief in the salutogenic value of nature contact (Ward Thompson 2010), and an appreciation for ecosystem services: the supporting, provisioning, regulating and cultural functions of the earth’s natural systems that sustain human health and well-being (Millennium Ecosystem Assessment 2005).

Yet, it is not fully clear how a city’s green infrastructure – its parks, forests, vegetated streetscapes, green roofs, living walls, community gardens, greened vacant lots, recreational fields, and riparian greenways – benefits human health and well-being. To shed light on this subject I conducted a review of literature in peer-reviewed journals addressing the association between urban vegetation and air pollution, heat-related morbidity and mortality, nutrition and food security, physical activity, mental health, and social cohesion. Evidence from these discrete bodies of research reveal some unexpected findings and suggest that psychosocial benefits may be one of the most defensible human health and well-being rationales for urban greening.

This has implications for policy and funding related to the urban landscape. It also has design and research ramifications. Indeed, current science seems to support normative calls for greening that break down the perennial divide between nature and city through the “interweaving,” “stitching,” and “conflation” of landscape with infrastructural systems (Waldheim 2006), “along necessary journeys" (Pincetl and Gearin 2005), and “at every doorstep” (Kaplan 1985).
If You See Something, Say Something: Community Response (and Non-response) to Outdoor Advertising Regulation in Los Angeles

Bryce Lowery, University of Southern California, United States, bryce.lowery@usc.edu
David Sloane, University of Southern California, United States, david.sloane@usc.edu

Keywords: Stewardship, outdoor advertising, spatial inequality, citizen participation, public policy

Outdoor advertising has long been a problematic part of the American landscape. To some, it amounts to little more than visual clutter; detracting from the inherent beauty of nature and architecture, but to others it is essential to community development and the economic vitality of place (1).

Recently, Los Angeles experienced an unprecedented increase in outdoor advertising as supergraphics and digital billboards appeared across the city. Both local officials and communities took notice; opponents and advocates alike squared off over new land use regulations in an effort to control the appearance of the city.

Los Angeles has a long history of addressing concerns about outdoor advertising through public policy. Starting in 1906, social reformers called for stringent controls over their placement and content and characterized them as “eyesores to civic beauty” (2).

The current proposal relies on zoning to guide the placement of outdoor advertising; designating the 21 regional centers of the city as sign districts. Despite suggestions that this solution represents a compromise, the ordinance remains controversial, as community members fear more advertising while billboard advocates suggest the proposal allows communities far more control over the appearance of local neighborhoods. Ultimately, communities have few options when confronted with a nuisance like outdoor advertising (3). Here, I hypothesize that communities most adversely impacted by their presence would be the most vocal in their response to this proposal. Their opposition would be salient in local policy discussions, developing into social relationships that become codified into law (4). But this does not seem to be the case in Los Angeles where affluent, white communities, spatially removed from the 21 regional centers, are overrepresented in their opposition to outdoor advertising. This research intends to explore why this is the case.

To understand the response to outdoor advertising in Los Angeles, I employ two datasets and qualitative data gleaned from public records, journalistic accounts, and interviews (5). The first dataset reflects the number and content of articles from the Los Angeles Times containing the words “outdoor advertising” from 1881 to 2013. The second dataset is a geo-referenced account of the quantity and content of comments made at public meetings about the sign ordinance. Qualitative data is derived from a review of policies related to outdoor advertising in Los Angeles as well as interviews with individuals associated with the sign district communities.
Influences of Plants' Motion on Landscape Preference, Attention Recovery and Affective Response

Man-Chun Hsiao, National Taiwan University, Taiwan, manchunhsiao@gmail.com
Chun-Yen Chang, National Taiwan University, Taiwan, cycmail@ntu.edu.tw

Keywords: motion, landscape preference, attention recovery, affective

We live in a dynamic environment. For example, there are micro climatic changes, seasonal transformations, alternating light and shadow, gusts of wind, and flowing water. These changes are an important part of visual environmental information. Kaplan (1995) addressed that there are four fundamental elements in a restorative environment, and he pointed out that many of the fascinations afforded by the natural setting qualify as “soft” fascinations: clouds, sunsets, snow patterns, and the motion of the leaves in a breeze. These readily hold one’s attention, enabling us to recover from the depletion of directive attention. Many studies have demonstrated that people prefer the natural environment, and that the natural environment can bring positive benefits, including reducing stress, restoring attention, and enhancing positive emotions. Previous research has confirmed that the visual information from natural scenery can bring about experiences of recovery. Moreover, most previous studies explored the effect of different landscape types and different natural elements on our landscape preference, affective experience and attention restoration, but there has been little research on the benefits to people of the dynamic information from the natural environment.

Our study discusses the effect of the motion of leaves in a breeze, as described by Kaplan. We took three videos of natural scenery with three different levels of motion strength as stimulation. Data was collected from 209 participants by Internet questionnaires distributed using random and snowball-sampling methods. The results indicated that as the strength of motion was enhanced, assessments of landscape preference, dimensions of affective response, and the fascination of four elements were elevated. The results and factors influencing this are discussed. Future research should investigate the effect of different motion factors, such as the dynamic of light, water flow, or transformation of seasons on our psychological and physiological responses.
Interpretive Signs in the Landscape: Are People Learning from Them?

Emilie Carter, University of Maryland, United States, emilie.c.carter@gmail.com
Christopher Ellis, University of Maryland, United States, cdellis@umd.edu

Keywords: environmental education, interpretive signage, stormwater, green infrastructure

Awareness and understanding of natural systems and processes can have a significant effect on the acceptance rates of green infrastructure and technologies. It has been documented in recent years that stormwater professionals and landscape architects are finding it increasingly necessary to include educational plans and public participation components when designing successful stormwater management systems (Neiswender, 2010). Much of this is due to regulatory requirements from the EPA and state or local governments, but it is also clear that education on stormwater issues is necessary for local decision makers (elected or not), homeowners, and citizens in order for those entities to make informed decisions regarding stormwater design and policies. (Neiswender, 2010). One way that designers incorporate education into designs is through the use of interpretive signage. By including interpretive signage on a site, designers aim to take advantage of a passive education opportunity to inform visitors as to how the landscape is assisting in managing and treating stormwater. While this practice is being implemented among many sites around the United States, it is unclear how effective these installations are in educating the public - specifically adults.

This study takes an in-depth look at the effectiveness of interpretive signage located around low-impact design elements, such as rain gardens, bioretention, and floating wetlands. In addition, general signage design is also being documented and analyzed. Data is being collected at two sites – Back Creek Nature Park in Annapolis, Md., and in Baltimore City’s Inner Harbor. Methods include surveying site occupants, field observation of occupant interactions with signage, and interviews with project designers. Initial data analysis from the pilot studying shows that interpretive signage does positively affect people’s views on environmentally sensitive design, but a variety of factors such as signage location and visibility of installation can affect the percentage of people who read signage. More robust data collection will continue into the spring of 2013 and results expect to identify design and implementation characteristics that may be more effective in communicating information to site users.
Into the Woods: An Anecdotal Study Exposing Children to Outdoor Classrooms

Amy LaTomme, Ball State University, United States, aclatomme@bsu.edu
Jody Rosenblatt-Naderi, Ball State University, United States, jrnaderi@bsu.edu

Keywords: Outdoor Learning Environments, Forest Kindergartens, Children,

“Ponds, brooks, patches of dirt, scrubby wastelands of bushes and trees, and tall manicured grass” are important features for children’s learning and development (Porteous). The landscapes accessible to children - home, school and public spaces - limit the diversity of natural and ecologically dynamic experiences children engage in and encounter. Because of this, children have developed aversions to interacting in and with natural and less manicured landscapes. With natural landscape elements missing in their formative years, it is no wonder that a third of all children are nervous about getting dirty (Day).

Recent interest in a public educational movement to teach young children in the outdoors has steady increased in Europe. Preschool classes, known as “wild” or forest kindergartens, allow children ages three to five to be in the outdoors learning, interacting, and playing with each other within natural landscape settings. In a forest kindergarten, children spend their entire day in their discovered outdoor classrooms receiving similar education to those children who are in an indoor preschool.

A child care center located in Muncie, Indiana, transported a group of three to five year olds to a local old growth forest. The children were joined by a group of undergraduate landscape architecture students who conducted observational research based on Clare Cooper Marcus’ book, People Places: design guidelines for urban spaces (1997).

With each visit to the forest, the dimension of the children’s experiences changed. Entering the forest on the first visit was structured and restricted. During that visit, the children were nervous and timid about experiencing their natural surroundings and the adults were nervous about letting the children experiencing it. During the next visit to the forest, the children were permitted by the adults and subsequently allowed themselves to explore and experience their surroundings. The final visit to the forest was child led. The children mimicked their natural, un-manicured setting.

The observations from the forest visits indicate that repeated exposure and experiences in a natural environment allow children to not only understand their surroundings but how they relate to their surroundings cognitively, spatially, and socially.
Investigating Children’s Play Space in the Context of Rapidly Developing City

Dongying Li, University of Illinois at Urbana-Champaign, United States, dli13@illinois.edu
Xiaolu Zhou, University of Illinois at Urbana-Champaign, United States, xzhou11@illinois.edu

Keywords: built environment, play space, participatory planning, GIS

Children are reported to be much less engaged in outdoors play. One important cause of the decline is the change in built environment characteristics (Brockman et al., 2011; Trost et al., 2002). This situation is particular serious in rapidly developing countries. In China, urban school age children face the severe problem of rapid shrink of traditional yard and neighborhood alley activity space, as well as the increase of high volume traffic arterials. Therefore, it is important to locate places where children choose to play and those where children avoid, and uncover the underlying environmental factors, in order to be able to propose design interventions (Walker et al., 2009).

In addition, being an underrepresented group, children’s real demands and preferences of the urban space remain largely unheard (Dennis, 2006). Traditional data collection methods such as interview and travel log are suggested to be problematic for such research on children. Therefore, it is urgent for us to develop a method that initiates the dialog between children and urban researches in an innovative way (Wridt, 2010).

The specific objectives of this study include: 1. To understand the specific places where children play and places where they identify as bad places in an urban environment. 2. To build an interactive platform that allows children to states the amenity and disamenity in their neighborhood from children’s perspective to create healthier and safer children’s geographies.

In order to achieve the objectives, we first developed a web-based platform using Google Map application programming interface (API) which allows children to identify the places they visit and draw on the map. Then, we conducted the online survey in a primary school in Yantai, China. 340 students aged 10-12 participated in this study. Locations of play places and bad places, as well as Likert-scale ratings concerning the functionality, destination, safety and aesthetics of the place were collected.

The result suggests that the activity space shows a more clustered pattern of play place than the perceived bad places. Regression analysis shows that the percentage of commercial and residential land use types, and the presence of educational facilities associate highly with play place density (p=0.010, 0.075, 0.009 respectively). Results of this study provide a better understanding of children's play space and suggest a way to make children’s voice heard. These efforts will establish a strong, evidence-based foundation for future neighborhood planning and design.
Just in Time: Psychophysiological Coherence in the Landscape

Brittany Harvey, Ball State University, United States, bdharvey@bsu.edu
Jody Rosenblatt-Naderi, Ball State University, United States, jrnaderi@bsu.edu

Keywords: psychophysiology, coherence, walking, contemplative landscape

This paper introduces general concepts of psychophysiological coherence (the synchronization of activity among the body’s oscillatory systems, such as respiration, heart rhythm, brain waves, etc.) as they relate to evidence-based landscape architecture. The harmonious synchronization of psychophysiological coherence (PPC) is associated with improved cognitive functioning and alleviation of stress and fatigue-related symptoms. These outcomes are associated with peak performance and improved health and well-being in users. Based upon a supportive review of literature, this paper presents the hypothesis that spaces effectively designed to aid meditative or contemplative walking are linked to patterns in the environment that are further linked to the synchronization of psychological and physiological processes leading to PPC. This could be of significance particularly to designers of therapeutic gardens working with landscapes that include a walking function.

Many researchers have studied the psychological and physiological benefits of healing, restorative, and contemplative environments in the design of evidence-based landscapes. However, the literature in therapeutic landscapes currently has a gap related to the link between the design of walking places and psychophysiological coherence as a measurable health outcome. For landscape architects, particularly those focusing on health, coherence may offer designers another metric for predicting health outcomes from the design of walking environments.

Walking has long been used as method to regulate cognitive rhythm associated with the body’s physical tempo. Meditative walking in particular has been shown to lower heart rate variability (steadier rhythmic pulse) independent of heart rate (emphasizing pattern and rhythm as opposed to speed) and increase cardiovascular synchronization (coherent respiration and heart rhythm) in both experienced and inexperienced meditators. These conditions are key components of PPC.

This paper examines patterns in case studies such as labyrinths and philosopher’s walks that have been historically used to promote the conditions necessary to elicit PPC in order to demonstrate the application of coherence principles in design. These types of landscapes in particular have been utilized for centuries for their ability to help shift awareness, focus the mind, and influence users’ experience through pace and consistency.

This paper serves to help bridge the gap between coherence research and the design of walking environments to enable better understanding of the underlying relationships between PPC, walking, and landscape pattern. This deeper understanding could affect the way we design for certain types of walking environments in order to yield these specific health outcomes.
Land, Water, and Territory: A 3,000-year Study of Niche Construction and Culture Change at Tikal, Guatemala

Timothy Murtha, Pennsylvania State University, United States, tmurtha@psu.edu
Kirk French, Pennsylvania State University, United States, kdf146@psu.edu

Keywords: landscape archaeology; cultural landscape; landscape history; gis; environmental modeling; Maya

This paper investigates the long-term spatial and temporal dynamics of land use management, agricultural decision-making and patterns of resource availability in the tropical lowlands of Central America. Overall, our project combines diachronic environmental simulation with historic settlement pattern survey to address a series of long-standing questions about the coupled natural and human landscape history in the Central Maya lowlands (at the UNESCO world heritage site, Tikal). This paper describes our preliminary results, including changing patterns of land, water, settlement and political history using climate, soil and hydrologic modeling and time series spatial analysis of population and settlement patterns. The critical period of the study, 1000 BC until today, begins with dispersed settlements accompanied by widespread deforestation and soil erosion. Population size and density grew rapidly for 800 years, while deforestation and erosion rates declined. This period was also characterized by striking evidence of political evolution, including the construction of monumental architecture, hieroglyphic monuments detailing wars and alliances, and the construction of a defensive earthwork feature, signaling political territories and possibly delineating natural resource boundaries. Population decline and steady reforestation followed until more recent migration into the region, which has impacted the biosphere ecology. Building on our previous research in the region and comparative research completed in Belize and Mexico, we are modeling sample periods the 3,000-year landscape history of the region, comparing land and water availability to population distributions and what we know about political history. Simulations are generated using historic climate and land use data, primarily relying on the Erosion Productivity Impact Calculator (EPIC) and the Penn State Integrated Hydrologic Modeling System (PIHMgis). Importantly, we are also analyzing the spatial patterns of land and water availability under simulated extreme climate conditions, e.g. drought and hurricanes, thereby not only addressing modern issues of migration and water availability, but also studying climate events as compared to the cultural history of the Ancient Maya.

This study primarily contributes to understanding long-term environmental change, agrarian decision-making, settlement patterns and critical issues facing agrarian communities globally. Specifically, our research provides an enhanced understanding of one of the most compelling landscape narratives of coupled human and natural history, i.e., the rise and fall of the Maya in the lowland tropical forest of Central America. Importantly, we offer a new approach to studying these broad issues, by integrating coupled climate, soil and hydrologic modeling, with more traditional landscape and anthropological research methods.
Life in the Ruins: Endings, Limits + Continuations

Jennifer Griggs, University of New Mexico, United States, jenn.griggs.nm@gmail.com
Katya Crawford, University of New Mexico, United States, katyac@unm.edu

Keywords: Ruination, Metabolism, Site Analysis and Narrative

The research presented at this conference focuses on ruined environments and communities, as defined by Laura Stoler. Ruin(ation) has a double meaning as it describes how capitalist industrialization degrades environments and community structures, one example being the destruction of local knowledges. Even in these ruins, there is still life, whether human or nonhuman, that provides a way to talk about the failure of mastery and control. I am interested in narrating this double ruination, of violence and of life, as a way to expose histories of violence and stories of resilience.

What emerged as an issue is after hegemonic structures ruined places, traditional remediation practices ignored the life within and the history of ruination. The problem is this approach adds another layer of ruin, especially as outsiders to communities often define the practices and aesthetics. How can landscape architects help insure they are not adding to the problem?

This theoretical foundation in discourse narrative is important to consider as remediation and restoration does not attend to violent histories and is not always sensitive to the degraded community structures that may still exist. Before design begins, I am calling for ‘site narratives’ that allow the polyvocal stories of humans, nonhuman animals and abiotic elements, or actants as Jane Bennett refers to them, to be considered as part of a metabolism defining that site. Metabolism has been used within Political Ecology (Robbins, Kaika and Swyngedouw) to refer to both the interconnectedness of things and also their transformative qualities, where there is a mix of endings, limits and continuations. Site narratives can hopefully attend to metabolisms rather than static entities.

To look at how metabolisms within ruination can be narrated, I conducted interdisciplinary case study research, some of which includes the work of Stewart and Hinchliffe. Within my thesis, the qualities and patterns that have emerged were then applied to site narratives made by landscape architects to see how the findings worked as guidelines. The poster constructed for this conference will use those findings to experiment with a narrative of an Albuquerque neighborhood. The last piece of this research is closing the gap between analysis and design. The final piece will be to use narratives as the foundation for design, and to then evaluate those outcomes.
Linking of Social values for Riparian Ecosystem Services and Quality of life

Jung A Lee, Korea University, Korea, Republic Of, arch-jung@Korea.ac.kr
Jinhyung Chon, Korea University, Korea, Republic Of, jchon@korea.ac.kr

Keywords: ecosystem service, social values, assessment of ecosystem, decision making process, ecosystem management

The provision of goods and services by ecosystems can bring many types of values in terms of benefits to human society (Daily et al., 1997). Ecosystem services are considered as a major factor promoting healthy and prosperous human life. While all aspects of ecosystem service values, such as economic, social, cultural, and ecological values, should be taken into account, special attention should be paid to the social values of ecosystem services, because the benefits of ecosystem services are associated with human well-being (Costanza & Folke, 1997; de Groot et al., 2002). In particular, the social values of ecosystem services should be taken into consideration during the decision-making process for sustainable landscape planning.

The purpose of this study was to investigate attitudes regarding the importance and contribution of the social values of ecosystem services, focusing specifically on riparian ecosystems. Following this investigation of social values, the study proposes goals for the planning and management of riparian ecosystems. Yangjaecheon, which is located in the Korean city of Gwacheon, was selected as the study site. A set of survey instruments was designed to examine residents’ attitudes. In September 2012, a series of on-site surveys was simultaneously conducted at several survey stations using a random sampling method. Five hundred and sixty respondents participated in this study and the collected data were analyzed using statistical processes [descriptive statistics, Importance- Contribution Analysis, and Fuzzy Control System].

The results revealed that, for the residents, Yangjaecheon is perceived as an important riparian ecosystem that contributes to the social values of ecosystem services. Although several items of the social values were shown to make little contribution to social values, these are considered important items in terms of ecosystem service value. The study also found that the highest social value with respect to the importance and contribution of riparian ecosystems is the “life-sustaining value.” The life-sustaining value of riparian ecosystems would be a significant element in achieving planning and management goals for riparian ecosystems.

The results of this study present the residents’ attitude regarding the importance and contribution of riparian ecosystems for the enhancement of ecosystem service values. These attitudes can also play a significant role in guiding fair and equitable decision making to help maximize the values of ecosystem services to the community. This work will contribute to formulating sophisticated planning and design strategies and technologies to enhance human well-being based on consideration of the social values of ecosystem services.
Lost Love: Thoughts on Canals, Chemicals, Caps, and Lingering Resistance to Climate Science

Denise-Hoffman Brandt, The City College of New York, United States, hoffmanbrandt@nyc.rr.com

Keywords: climate change, environmental advocacy, brownfield, ecology

The publication of Silent Spring and the discovery of the Keeling Curve marked monumental moments in the history of the human species’ understanding of its own positioning within global ecosystem relationships. On the fiftieth anniversary of The New Yorker’s serialization of Silent Spring, Rachel Carson’s challenge to governmental lassitude toward industrial chemical contamination of the American landscape, it is evident that her message has not curtailed the development of more complex pesticides and genetically modified foods. Her observation that: “For the first time in the history of the world, every human being is now subjected to contact with dangerous chemicals from the moment of conception until death.” foreshadowed the scope of climate change projections based on C. David Keeling’s upward-rising curve of measured atmospheric carbon dioxide. The Keeling Curve presents the foundational data substantiating climate change, yet it is not well-known.

This scenario reveals the ongoing resistance to a core idea underlying both projects: the concept that human landscape practices have the capacity to alter environmental cycles sustaining life on earth. In 1979, Love Canal entered the American environmental lexicon as an emblem of top-down municipal failure and bottom-up environmental activism, yet today, it is a relatively unmarked memorial to a tragedy that Americans appear to prefer to forget. This paper examines the popular resistance to perceiving destructive human ecological impacts through the lens of the chemical industry, capping, and current development of the Love Canal site in Niagara Falls, New York.
Neighborhood versus Route Environments for Active Commuting to School

Jae Woong Won, Texas A&M University, United States, jaewoongwon@neo.tamu.edu
Chanam Lee, Texas A&M University, United States, clee@arch.tamu.edu

Keywords: Active living, Built environment, School commuting, Active transportation, Children

Background: The built environment plays a pivotal role in promoting active commuting to school. Active travel modes (walking and bicycling) can bring health benefits as physical activities, and environmental benefits as clean travel modes. Active commuting to school has shown to be related to perceived and objective measures of the built environment, such as distance, route characteristics, and crime and crash risks. An important area less explored is the relative roles of the environments around homes, schools, and along the home-to-school (HTS) routes.

Purpose: This study examines if and how environments around homes versus HTS routes may influence active commuting behaviors differently. The school environments are excluded due to the smaller sample size (multiple students attending the same school) and the fact that they are destinations (origins and routes are more immediate environments influencing the mode choice for home to school travels).

Method: Cross-sectional survey data (N=4,562) were collected in 2010 from the parents of students from 20 elementary schools in Austin, Texas. All but objective environmental variables were collected from this survey. Objective measures around home and HTS routes were measured in Geographic Information System (GIS) for each survey respondent. A half mile circular buffer around each respondent’s home was used as the spatial boundary to capture home environmental variables, and a 100-feet buffer along each side of the shortest HTS route was used to capture route environmental variables. A multilevel logistic regression was employed to estimate the odds of using active travel modes to school. This method helps to account for the potential clustering effect at the school level.

Findings and Conclusion: After controlling for all significant survey variables and GIS-measured distance to school, different objective environmental variables from home versus route were shown to be associated with the odds of using active modes to school. Crime density was significantly correlated with active commuting only when captured from the home buffer, while infrastructure variables were more important when measured from the route buffer. Preliminary findings suggest that objective measures to analyze the built environment for the purpose of identifying effective interventions to promote active school commuting need to consider different spatial settings. More empirical studies are needed to systematically compare similarities and differences in the specific built environmental features around homes, schools, and HTS routes that can contribute to encourage active commuting to school.
New Tools for Measuring and Predicting Place Attachment on a Neighborhood Level

Aliaa Elabd, North Carolina State University, United States, aaelabd@ncsu.edu
Robin Abrams, North Carolina State University, United States, Robin_Abrams@ncsu.edu

Keywords: Place attachment-People-place relationships- Physical environment-Parks and Playgrounds-walkability-Amenities

The aim of this study is to propose new tools for measuring and consequently predicting the place attachment construct, in relation to the physical features of the built form. Place attachment as a phenomenon incorporates several aspects of people-place bonding and involves many inseparable, integral and mutually defining features (Low & Altman, 1992). Place attachment construct can be fostered through the frequent interaction with the built environment and people. Although, place attachment is relevant to ‘place’, it has been mostly studied from a phenomenological and social perspective. There is a relative paucity of research that has focused on how the attributes of form and space within a neighborhood might contribute to the residents’ sense of attachment. For the multiple benefits of place attachment, and its importance for the health, stability, residential livability, and quality of life on a neighborhood level, there is a need to consider it on a larger physical scale by both designers and planners.

This research proposes several potential formal, spatial, and social factors that are hypothesized to relate to place attachment, through studying two communities in Durham, NC. The findings identified perceived walkability, the variety and convenience of the neighborhood and downtown amenities, including parks and open places, as major physical factors correlating to the residents’ sense of attachment. In addition, communal and social factors such as friends in the neighborhood and the frequency of interacting with neighbors also correlate to the sense of place attachment.
Parsing Wildness: Parks in the Shrinking City

Susan Dieterlen, State University of New York, United States, sdieterl@esf.edu
Meghan Holtan, State University of New York, United States, mtholtan@yahoo.com

Keywords: postindustrial, open space, methods

The postindustrial city park is a landscape in flux. Here the traits associated with shrinking cities (Oswalt 2005) intersect with rising populations of invasive exotic flora, wild and feral fauna, changing preferences for more natural-looking recreational landscapes, and growing demand to address ecological concerns such as air and water quality. The resulting changes in turn impact residents’ and users’ perception and use of the parks (Ryan 2005), extending to the social and economic health of adjacent neighborhoods. Amidst this change, the physicality of the park remains largely fixed in the time of its design and construction.

While recent scholarship has addressed the increase in wild urban spaces (Jorgensen and Keenan 2012), what defines this quality of wildness? As a fundamentally interdisciplinary construct, how can wildness be defined and measured to allow comprehensive yet substantive study of change over time, causes, and impacts?

This research produces a transdisciplinary definition of wildness through the combination of design, social, and natural science viewpoints. It operationalizes that definition through use of GIS (Geographic Information Systems) and remote sensing to measure an increase in wildness over the past thirty years in an urban park, located in Syracuse, New York. Findings show a marked increase in wildness as defined in the study, aiding in the definition of this elusive yet pervasive quality of critical import to postindustrial place and space. Additional findings suggest an association with changes in park management and use, lower income and socioeconomic status in adjacent neighborhoods, and the presence of wild and feral fauna in neighboring areas.

The definition and method developed promise to be instrumental in the larger study of wildness throughout the city of Syracuse, and to in turn illuminate the costs and benefits to residents and ecosystems in postindustrial small cities throughout the US.
Planting Design and Its Impact on Efficacy in Therapeutic Garden Design for Dementia Patients in Long-term Care Facilities in North Texas

Cuiyan Mei, University of Texas at Arlington, United States, cuiyan.mei@mavs.uta.edu
David Hopman, The University of Texas at Arlington, United States, dhopman@uta.edu

Keywords: Planting design, therapeutic garden, dementia patients, long-term care facilities

This research addresses planting design and its therapeutic benefits for bringing life-enhancing therapy to people dealing with dementia. The senses heightened by plants have proven to be powerful stimulators of early, emotional childhood memories due to the structure and evolution of the human brain (Minter, 2005). Plant materials used in therapeutic gardens are carefully chosen to stimulate the senses of dementia patients (Marcus and Barnes, 1999; Minter, 2005; Chalfont, 2008) and to enhance safety and security, orientation, stimulation and autonomy.

Many long-term care facilities for dementia patients have been built in the United States to provide settings for optimal care (Desai and Grossberg, 2010). A number of studies demonstrate the healing benefits of plants and the natural environment (Marcus and Francis, 1998). However, researchers suggest that there is a need for more empirical studies on the therapeutic or healing benefits of gardens in health care facilities (Marcus and Barnes, 1995, cited in Ghose, 1999).

This study adapts the theoretical, anecdotal and clinical research of the therapeutic effects of plants and nature into the realm of landscape architecture. A set of preliminary planting design guidelines used for therapeutic gardens is proposed from the review of relevant theories and research. The study primarily follows qualitative research methods (Taylor and Bogdan, 1998) and evaluation (Rossi, Lipsey and Freeman, 2004) in order to assess the patterns of use in existing gardens and the possible therapeutic benefits experienced by their users. Passive observations of the principal user groups in a long-term care setting are utilized as basic data. Also, a number of interviews are conducted with staff and patients’ family members in these facilities. The preliminary planting design guidelines are tested against the existing qualities of the therapeutic gardens relative to the preference of the users.

Landscape architects designing gardens for dementia patients in long-term care settings can include special plants which are aromatic, colorful, have seasonal interest and fine texture, produce special sound, attract wildlife and provide appropriate sun or shade. Chosen either to suit a particular group of residents, or as an expression of a regional plant and materials palette, these gardens can be used by horticultural therapists and nursing staff to provide many benefits to dementia residents in long-term care facilities.
Reading Place Through Reconnaissance Running

Noah Billig, University of Arkansas, United States, nsbillig@uark.edu
Kimball Erdman, University of Arkansas, United States, kerdman@uark.edu

Keywords: running, cultural history, natural history, place studies, reading landscapes

This study examines running as a means to understand place and landscape. In particular, the “reconnaissance” run in unfamiliar places is used as a mode for strengthening cognitive maps that are cues for further study of place, including natural and cultural history. These runs also provide clues to the networks and connections of places. Previous work has evaluated reading landscape and place through other modes of moving, e.g. walking (Vaughan 2009 and Wunderlich 2008), biking (Spinney 2009), and driving (Appleyard, et al. 1965). Also, the use of running in site design has been explored (Pollan 1997). However, running as a means of understanding place on the larger scale – namely its study of cultural and natural history and its networks, connections and places – has not been thoroughly explored, despite running’s pervasiveness and continued growth in participation (SGMA 2012). This study hypothesizes that, to some degree, many runners implicitly read place through running. It is also contends that running can often contribute to a unique and valuable evaluation of place and landscape that is not possible or as easy when in a car, walking, biking and/or in transit.

For this study, the authors draw on their own experience of running in unfamiliar territory in North America, Europe and Asia. Case studies explain multiple experiences with reconnaissance runs. In particular, two aspects are described in detail – the specific cultural and natural history that was discovered on a run; and the current networks and connections of places. It is found that, while a great deal is discovered on the run itself, deeper readings are contingent on study of place beforehand and further study about a place conducted after the run. Prior analysis includes such things as map reading/memorization and reading about cultural and historic elements. The further study of place – including study of what was and what is in the greater cultural and natural landscape – is found to greatly add to the reconnaissance run’s value.

Running is found to be a means to a way-finding end in the act itself. It also can act as an impetus for the further study of place. Running as a mode for reading and understanding place is important because of the possibilities it allows one to envision and the history it inspires one to explore. Deep readings are made that otherwise would not be discovered.
School-based Environmental Approaches to Promote Walking to School: Modifiable Micro-scale Environmental Factors

Chanam Lee, Texas A&M University, United States, chanam@tamu.edu
Woosung Lee, Daegu University, South Korea, wslee1980@gmail.com
Hyungjin Kim, Kansas State University, United States, hyungjin@ksu.edu
Diane Dowdy, Texas A&M Health Science Center, United States, Dowdy@srhs.tamhsc.edu
Deanna Hoelscher, University of Texas - Austin, United States, Deanna.M.Hoelscher@uth.tmc.edu
Marcia Ory, Texas A&M Health Science Center, United States, MOry@srhs.tamhsc.edu

Keywords: built environment, school, walking, children

Background: Walking to school has been recognized as a key strategy to help school-aged children incorporate daily physical activity. Built environments are important determinants of walking to school. Despite the growing number of empirical studies on environmental factors, empirical evidence on the roles of specific micro-scale variables is limited. Further, compared to the large number of studies focusing on neighborhood environments, studies on school environments which are effective intervention targets are scarce.

Purpose: Addressing two of the understudied links in built environment and walking-to-school relationships, this study is to identify: (1) readily modifiable micro-scale built environmental variables, and (2) school environmental factors including school campus design and nearby streets, associated with school-level walking mode share.

Methods: This study examined 77 elementary schools across Texas. The data came from classroom tallies for school-level walking mode share (outcome variable), audits (micro-scale built environmental variables), and Geographic Information System and Census (macro-scale variables), collected and analyzed from 2009 to 2011. Audit and tally instruments used in this study had good reliability in previously published studies. Linear regression models were used to predict walking mode share.

Findings: After controlling for the neighborhood demographic and macro-scale variables (e.g. urban-rural setting, attendance zone size, economic and racial compositions, street connectivity, and crime density), walking mode share was higher in schools surrounded by primarily residential areas, than those surrounded by mixed land uses or vacant lots. Sidewalks, crosswalks, safety signs, street parking, and street lights around school were associated with increased walking. In terms of the school campus designs, pedestrian only entries/exits, pedestrian-friendly amenities like picnic tables and connected pedestrian pathways from streets to school buildings, were positively associated with walking. However, school bus only entries/exits and sports fields on school campus were negative factors. School bus entries/exits can create unsafe environments for pedestrians, due to complex bus traffic patterns related to dropping off and picking up students with busy peak hour operations. Sports fields, compared to other on-site amenities such as sports courts, paths, picnic tables, benches, etc., require a large land area and therefore can reduce pedestrian accessibility or connectivity to school buildings.

Conclusions: Micro-scale environmental features at and around schools were significant predictors of walking mode share. This is one of the few studies that assessed a wide range of micro-scale variables and identified a small subset of promising school-level intervention targets for promoting walking to school.
Spatiotemporal Soundscape Variation of Large Urban Parks: An Analysis of Psychoacoustic and Physical Indicators of St. James’s Park, London

Mark Lindquist, University of Sheffield, United Kingdom, mark.lindquist@sheffield.ac.uk
Jian Kang, University of Sheffield, United Kingdom,
Eckart Lange, University of Sheffield, United Kingdom,

Keywords: Environmental acoustics, Landscape experience, Psychoacoustics, Soundscape

Soundscape is defined as the “overall sonic environment of an area, ranging in size from a room to a region” (Porteous & Mastin, 1985, p. 19). Interest by government and policymakers is increasing in this area, particularly in the regulation and abatement of sound in the form of environmental noise (e.g. Directive 2002/49/EC, 2002). Soundscape research aims to examine the ‘acoustic environment primarily where the sounds present produce outcomes that enhance, enable, or facilitate, human enjoyment, health, well-being or activity.’ (Brown, Kang, & Gjestland, 2011, p. 391). In a landscape context research and policy are often aimed at making an environment quieter, with the assumption that quietness (i.e. dB level) is necessary for enjoyment of a place. Soundscape is perceptual, however, and as such context dependent (e.g. loudness in one context may not necessarily be perceived as loud in another setting). This was the point of departure for the current research project, the aim of which was to identify soundscape variation of a large park over the duration of a day, to inform a larger research project investigating perceptual responses to landscape and sound.

The research analysed the soundscape of St. James’s Park, London, UK. Sounds were recorded digitally in hi-fidelity (48 kHz sampling rate, 24-bit resolution) with an Edirol R-44 4-channel portable recorder using 1 channel (mono) and a mono microphone, while simultaneously measuring L&Aeq, L&amin and L&amax with a 01dB Solo Sound Level Meter. 2-minute recordings were taken at 6 sites within the park, with a seventh site on the periphery added for a comparison of sound level. Each site was recorded and measured at 4 times (0700, 1200, 1700 and 2200) over a 24-hour period. Psychoacoustic characteristics, which aim to merge objective physical properties of acoustic stimuli with physiological and psychological responses, were analyzed in addition to measured sound pressure level for each 2-minute recording using HEAD ArtemiS software (Head Acoustics, 2012). Four well known psychoacoustic metrics were chosen to evaluate the soundscape of the park as they have been used in multiple studies previously: 1. Sharpness; 2. Fluctuation strength; 3. Loudness; and 4. Roughness. The results indicate significant variation of both physical measurements and psychoacoustic properties over the 24-hour period, clearly demonstrating that late evening (2200) has the lowest measured SPL and psychoacoustic characteristics. The results are examined in relation to current research, and the implications for designers operating within the urban context discussed.
Temporal Agents and the Power of Play in the Built Environment

Jane Choi, Colorado State University, United States, jane.choi@colostate.edu
Scott Carman, Colorado State University, United States, scott.carman@colostate.edu

Keywords: play, temporary interventions, healthy environments, community engagement

Researchers have long touted the many developmental benefits of physical play for children (Ginsburg, 2007). More recently, evidence has been accumulating of the importance of play for people of all ages. Some of the documented personal and community benefits of play include improved fitness, greater social cohesion, stress relief, greater creativity and productivity in the workplace and improved interpersonal relations (Kemp, Smith, DeKoven and Segal, 2012). The integration of play into the urban environment, however, has long been approached and even legislated in stark diametric terms, with playgrounds and recreational areas built specifically as destinations for play, with various forms of play either implicitly or explicitly prohibited in many other public urban settings. In order to bring the benefits of play to a greater number of people and communities, designers must begin to explore opportunities for introducing unexpected and limited-duration ‘play interventions’ in settings where people are otherwise going about their daily routines. Indeed, this ‘discovery’ of the unexpected is one of the key elements of play, imbuing an otherwise ordinary routine with surprise, delight and a sense of whimsy. This effect can be seen in interventions as diverse as a temporal public art installation, such as Christo’s ‘Gates’ in New York’s Central park, or a participatory community gathering or event. Though artists have been at the forefront of this movement, landscape architects are well positioned to understand, allow for, and encourage such interventions in the built urban environment. Designers and artists (John Bela, ReBar Group, Howeler Yoon, Daily Tous les Jours) and community and civic organizations (MOMA PS1, LiveWell, The National Institute for Play) have offered important examples of these principals in action that are worth understanding and emulating. Through precedent studies, behavioral research and theoretical writings, the significance of time-limited and unexpected events and interventions within the built environment will be presented not only as a topic of design consideration for landscape architects and students of landscape architecture, but also as an urgent contemporary planning issue with greater ramifications for the physical and psychological health of the community. Viewed through the writings of behavioral researchers, anthropologists, and play and health advocates (John Fox, Dr. Stuart Brown, Kevin Carroll, LiveWell), we will seek to reach an understanding of the design possibilities for temporal interventions as part of an integrated approach to building more playful, inclusive and socially responsive places within our built environment.
The Case Studies of Treatment Effect of Horticultural Therapy Activities on Dementia Patients

Chih-Fan Tung, National Taiwan University, Taiwan, fan770109@hotmail.com
Chun-Yen Chang, National Taiwan University, Taiwan, cycmail@ntu.edu.tw
Sheng-Jung Ou, National Chung Hsing University, Taiwan, sjou@dragon.nchu.edu.tw

Keywords: Horticultural Therapy、Dementia、Case Study

The horticultural therapy is one of complementary therapy applying plants to promote individual physical, psychological, cognitive, and social well-being. Except for the medication, horticultural therapy has been adapted for cares of dementia patients. The purpose of this study was to explore what kind of benefits can be generated from horticultural therapy programs for dementia patients, and to provide specific design guidelines for different levels of dementia patients. Three different levels of dementia patients were chosen as the study cases. The in-depth interview and the semi-structured interview were adopted to collect data by the video camera. The in-depth interview was applied to understand overall feeling of patients during activities and the semi-structured interview was conducted to collect more observation data after activities from patients' family and social workers. Responses and dementia patients' facial expressions were analyzed with the Atlas.ti 7 qualitative analysis software.

The results of responses showed that there were physical benefits (e.g., promoting physical health), psychological benefits (e.g., expressing thanks and modest, increasing sense of pride and accomplishment, decreasing anxiety, improving positive emotion, thirsting for knowledge, feeling interested), cognitive benefits (e.g., evoking past memories, improving observation, thinking and sensory stimulation, inspiring imagination, enhancing memory function), and social benefits (e.g., improving share, help, engagement, and praise). Furthermore, their positive facial expressions were also elicited during activities. The activities in the horticultural therapy guidelines should be considered from various perspectives such as patients' interests, habits, experiences, symptoms, and etc. For the patients with better abilities, new and interesting activities are important that can create new experiences. For the patients with low abilities, the use of repeating activities to evoke their past memories is recommended. The results could help medical staffs and family caregivers to design the special program of horticultural therapy for dementia patients in the future.
The Cognitive Play Behavior Affordances of Natural and Manufactured Elements within Outdoor Preschool Settings

Zahra Zamani, North Carolina State University, United States, zzamani@ncsu.edu
Robin Moore, North Carolina State University, United States, robin_moore@ncsu.edu

Keywords: natural elements, preschool, cognitive play behavior, children

The reduction of accessible natural outdoor spaces within urban conditions, increasing number of manufactured playground elements, and children’s reduced chances of independent mobility have impacted young children’s reduced chances of contact with nature. The importance of integrating natural features in playgrounds has been neglected, while it has a critical role in children’s development, health, and learning. Many professionals are manipulating the physical environment without considering the developmental consequences of the design approach. Hence, empirical data is required to establish policies and design decisions associated with children’s developmental requirements. In the current study the concept of affordance was implemented for assessment of outdoor environments based on their functional characteristics. Gibson (1979) explains that when a structure in an environment invariantly supports a specific behavior of a given organism, it affords that behavior. Based on an educational perspective, and through the application of behavior mapping, the purpose of this study was to indentify outdoor elements that afford cognitive play behaviors for children. The researchers assumed that natural elements within outdoor earning environments are more flexible and inspiring, thus affording diverse types of cognitive play behaviors. Two outdoor preschool settings in North Carolina, designed by Natural Learning Initiative as natural learning environments and with a variety of natural and manufactured elements, were intentionally selected for this study. Sixty two, four-to-five year old children were systematically observed during free play and coded for cognitive play behaviors (Rubin, 2001), and the type of elements they were interacting (natural loose, natural fixed, manufactured loose, and manufactured fixed). Through implication of a correlational approach, the results of 471 data points revealed how natural elements can afford opportunities for multiple types of cognitive play behaviors. For instance, natural loose elements had potentiality in affording constructive, dramatic and exploratory play behaviors, compared to manufactured fixed equipments that mostly afforded functional behaviors. The fact that exploratory play was the least afforded type of behavior within both environments suggests the requirement to increase the implementation of features that afford discovery and engaging opportunities for outdoor learning environments. The results of this study accentuate the importance of integrating natural elements within children’s outdoor learning environments to provide a range of cognitive play behavior opportunities. By identifying the cognitive play behavior affordances of specific elements, the results can also provide guidelines for policy makers to create high quality outdoor learning environments that will encourage complex levels of cognitive play behaviors of young children.
The Decommissioning of Parks in Detroit, Michigan: A New Strategy

Erik Bush, Pennsylvania State University, United States, erikbush18@gmail.com
Sean Burkholder, Pennsylvania State University, United States, slb59@psu.edu

Keywords: Parks, Sustainability, Detroit, Vacancy

The city of Detroit, Michigan is in a severe financial crisis. Numerous city services have been cut, one of which is park maintenance. Detroit has made the decision to decommission nearly 1600 acres of park space and reposition nearly 550 acres of park space in the city, leaving it to become overgrown and at first glance, unusable for residents. This research accepts the reality of Detroit’s unsustainable park management costs and looks at the methodology of this decommissioning and evaluates if and to what degree social and ecological factors were taken into account. The consideration of social/demographic characteristics was evaluated through Geographic Information Systems (GIS) analysis. It was hypothesized that the city of Detroit chose to decommission parks based solely on maintenance costs and did not readily consider social/demographic characteristics. This research proposes new culling strategy for decommissioning parks that takes into account social issues, in particular the addressing of populations identified as “at risk”. It was decided that these user groups would be individuals under age 15 or over age 65, based on an assumption that these populations have a higher need for public space and lower mobility to access them. Next, ecological characteristics were considered. Characteristics such as tree cover, soil condition and adjacency to water were prioritized. Areas ranking high in these characteristics could be decommissioned and require little or no management while still providing valuable ecosystem services. This analysis resulted in two separate types of parks: parks for people, and parks for nature. The goal of developing two separate strategies was two fold; one, to provide social benefits to the people who need it the most, and two, to determine which parks had the most potential to provide ecosystem services to the city. This produces a more cost-effective strategy for decommissioning parks while still allowing them to provide benefits.
The Effect of Sound of Water on Human Physiological Responses

Chien-Fu Liao, National Taiwan University, Taiwan, derek19891@hotmail.com
Chun-Yen Chang, National Taiwan University, Taiwan, cycmail@ntu.edu.tw

Keywords: water sound, heart rate, electromyography, electroencephalography

People adjust psychologically and physically to adapt to environmental changes, including sound waves (auditory), light waves (visual), and pressure (touch). Sound is transmitted to the auditory system through the nerve signal pathways. The auditory pathways are the shortest leading to the most rapid conduction of sound waves. Thus sound plays an important role in forming the first impression of the environment. Physics defines sound as a pressure wave, which is composed by frequency and amplitude. The transmission of signal fluctuations also transfers energy.

Previous researches have highlighted the impact of environmental sound on people. Schafer (1973) developed the concept of “soundscape”. Some researchers classified soundscapes into natural and man-made sound. Empirical results have shown that people prefer natural sounds; particularly the sound of flowing water in the outdoors catches our attention. Natural sounds, such as the sound of flowing water, produce alpha waves in the brain, which are soothing, relaxing and ease the heart rate. Thus this study aims to (1) exploring the effect of the sound of flowing water on human physiology and (2) determine whether it creates a physiologically soothing relaxation response. Previous researches have reported that sound fluctuations will affect ANS parameters such as heart rate (HR), brain waves (EEG), and electromyography (EMG). In this study we compared the listener’s physiological response (HR, EEG, and EMG) to amplitude of the sound and explore their relationship on the time sequence.

Convenience sampling was used in the research among National Taiwan University students. They were placed in a laboratory which control environment temperature, light and shielded from external noise interference. The participants were exposed to three sections of city noise. Following the noise from each section, the subjects were exposed to the sound of flowing water, which be presented at three different volumes: low, medium, and high. The physiological measures were recorded on a biofeedback instrument. Physiological data was collected from 35 participants and the obtained data be compared to the sound spectrogram. The effect of per unit time of amplitude on physiological reactions were discussed. The result reveal that we could obtain physiological mediated abatement of noise by flowing water sound. Being exposed to flowing water sound after city noise, EEG, EMG and HR are lower, and different amplitude induce different soothing effect, while HR is rising follow the addition amplitude. This would be conducive to human wellbeing in situations that demand pressure release, especially hospital and city park.
The Ignored/Lost Contest for Land-waste Infrastructure in India

Suvarna Apte-Dalvie, Hong Kong University, Hong Kong, aptedalvie@gmail.com

Keywords: Waste Infrastructure

This is a research based in India looking at the infrastructure of waste in a country where everything related to infrastructure is an absolute necessity yet completely overwhelming to execute prospect. The aim of the research is to gather information, analyze and draw out various opportunities on how the city and the surrounding metropolitan areas can respond to their changing needs.

The research focuses on city of Indore is located in Central India- a thriving Tier 3 commercial city with a strong cultural background in the state of Madhya Pradesh. Founded in early 18th century, it served as an important hub between North and South of India. It is dense (1.96million population, 2011 census), well connected with several smaller “satellite” towns of Ujjain, Dewas and Maheshwar. It is a city that is poised to become a Tier2 city in the near future attracting over 2 million immigrants over the next 10-15 years. The research is based on the belief that this type of participation in building of waste infrastructure has to start from third to second tier cities where the scales are still manageable. The city’s administrations are able to look far ahead of the first tier city’s that are barely coping with the exploding populations.

Landscape architects are traditionally marginalized in questions of participating in the city’s agenda of growth and attracting investments. Issues such as growth remains in the hands of city planning but driven mainly by businesses and politicians. Infrastructure such as waste remains ignored as the concentration remains on providing basics as water supply and sanitation. It is curious that sanitation does not include long term planning of disposal of waste. This research also looks into cultural aspects of why the disposal of waste ignored at personal, community and city administration level. Land allocation is clearly at the heart of matter since it becomes highly politicized but also the cultural practice of the caste system plays a hand in it.

The research aims to find inroads for landscape architects to participate in preparing the city’s infrastructure for this predicted growth. It plans to have paper and an exhibition by gathering the information, synthesizing and presenting ideas to various interest groups to start a serious discussion towards the goal of creating a framework for waste infrastructure.
The Physical Activity Affordance of Diverse Park Settings in Accordance to Gender

Zahra Zamani, North Carolina State University, United States, zamanizzz91@gmail.com
Robin Moore, North Carolina State University, United States, robin_moore@ncsu.edu

Keywords: gender, physical activity, urban park, affordance, behavior setting

Urbanization has reduced individuals’ opportunities to be physically active while being in contact with natural environments. Urban parks can provide significant spaces for people to be involved in diverse physical activities while interacting and retreating with nature. The concept of behavior setting and affordance can provide a basic foundation to understand the functional properties of the settings within parks based on the behavior of the users. This approach can contribute understanding the requirements of different users through the design process. However, there are few empirical studies regarding the preference of different genders groups for diverse urban park settings. Through the application of behavior setting and affordance, this case study explored the relationship between the gender characteristics of park users and the physical qualities of the settings promoting distinct activity types. Data collection was through behavior mapping. Overall, 475 data points were collected. The results indicated a significant relationship between the existence of continuous hard pathways and active behavior. Females were more attracted to settings affording socialization and were more involved in sedentary physical activity compared to males. In contrast, males were more attracted to settings affording active group activities. The result of this study accentuates the importance of creating diverse behavior settings based on gender preference and requirement.
The Relationship between Poverty, Community Land Use, and Older Adults’ Opportunities for Social Integration

Keith Christensen, Utah State University, United States, keith.christensen@usu.edu

Keywords: elderly, older adults, land use, social integration, social interaction

Social integration in community is important for an individual’s well-being. Characteristics of the physical environment affect opportunities for social integration in communities independent of socioeconomic and demographic variables. Older adults are often marginalized in the social environment, which may be due to their residing in socially isolating environments.

The purpose of this study was to examine to what extent older adults, 65 years of age and older, reside in physical environments that contribute to opportunities for social integration. The research question was whether older adults’ places of residence correlated with mixed-land use environments, commonly seen as positive pedestrian-oriented social environments (Brown et al. 2009; Frank et al. 2006; Leyden, 2003). The study was conducted within Utah’s Weber and Davis counties, an area reflecting land use diversity patterns consistent with typical urban and suburban U.S. communities. The measures were determined according to 259 census block groups within the study area. The study population’s age was measured using Census 2000 Summary File 3 data within each census block group. The measure of mixed-land use is an entropy score describing the diversity of the distribution of four land use categories (single family residential, multi-family residential, retail and services, and institutional land use) for each block group area. To control for socioeconomic factors between the census block groups poverty status data from Census 2000 was used to determine the percentage of individuals 65 years of age and over whose income was below the poverty level within each census block group.

Linear regression was conducted to determine the magnitude of the relationship between census block groups’ percent of population over 64 years of age (criterion), percent of population below poverty level (predictor to be controlled for), and the land use diversity (predictor). Statistical significance was determined at $\alpha = .05$. Statistical analysis was conducted using SPSS v17 and geospatial analysis was conducted using ESRI ArcInfo 9.3

The results strongly suggest that the most significant associations with older adults’ places of residence are socioeconomic. However, this study also suggests that older adults’ places of residence are associated with mixed-land use areas, although weakly, suggesting that mixed-land use is a poor method to operationalize a pedestrian-oriented social construct. In conclusion, while the study suggests that older adults are more likely to reside in environments that contribute to opportunities for social integration as measured by mixed-land use, mixed-land use is not an appropriate measure for pedestrian-oriented social environments.
The Socio-cultural Meaning of Urban Comfort and Its Consequences for Urban Landscape Design

Silvia Tavares, Lincoln University, New Zealand, silviagarcia.tavares@lincolnuni.ac.nz
Simon Swaffield, Lincoln University, New Zealand, simon.swaffield@lincoln.ac.nz
Emma Stewart, Lincoln University, New Zealand, emma.stewart@lincoln.ac.nz

Keywords: urban comfort, microclimate, cultural adaptation, landscape design

Urban environment influences the way people live and shape their everyday lives, and microclimate sensitive design can enhance the use of urban public spaces. However there is also some evidence to suggest that culture shapes the way people respond to microclimate and environment (Knez & Thorsson, 2006, 2008). This paper examines the relationship between microclimate and urban culture in New Zealand. The investigation is based on the theoretical construction of urban comfort. The central proposition is that instead of a human physiological attribute, urban comfort is understood as a cultural achievement. The aim of the study is to understand users’ preferences for, and adaption to, urban microclimate in different urban environments, and to identify design strategies that can extend the use of public spaces throughout the year. The focus is the city of Christchurch, where a series of destructive earthquakes has forced the city to re-plan and rebuild its CBD. A distinctive feature of this research is its focus on the way people are adapting to both surviving pre-quake and new post-quake environments. The theoretical basis is explained and preliminary findings from the first year of field work – using both participant observation and 60 in-depth interviews with Christchurch residents – are presented. The investigation sought answers to the following questions: a) What are the preferences of Christchurch residents for (micro)climate?; b) How do the socio-cultural values of local landscape and regional outdoor culture affect perceptions of microclimate and its significance for urban living?; c) How do people adapt to the climate/weather and how are these dimensions expressed in the local culture?; and d) What is urban comfort in Christchurch’s context and how can it be enhanced through urban landscape design? The main outcome of this work is an improved understanding of cultural and social meanings of urban space from the perspective of microclimate and comfort, and identification of landscape design strategies to enhance urban liveability. Preliminary findings suggest that in the specific context of Christchurch, the strong connections between urban and rural settings present in culture, lifestyle and landscape seem to increase the desire for contact with nature within the city. This generates a particular aesthetic and recreation preference for urban spaces, which in turn influences the way people adapt to urban microclimatic conditions. Urban comfort is a useful concept through which to understand these relationships and to shape design responses.
The Suburban Threshold and the Potential Link to Community Sociability

Kristian Kelley, Arizona State University, United States, kkelley6@asu.edu

Keywords: Suburbs, Sociability, Neighborhood, Community, Length of Residence, Sense of Community

The suburban form has been the subject of much criticism over the past decades. Designers point to its lack of aesthetics and monotony (Tacheiva, 2010) (Dunhan-Jones & Williamson, 2009), while medical professionals point to its link to obesity (Strum & Cohen, 2004) and American’s waning mental condition (Jackson & Tester, 2008). As designers we ask questions and examine the suburban context for clues that might shed light on why this form of development creates such negative consequences. This paper examines the impact of typical suburban development on neighborhood sociability and investigates one variable’s ability to encourage social interaction in suburbia.

Existing research on community sociability focus on “sense of community” (Brown & Croppe, 2001) (Lund, 2002) (Kim & Kaplan, 2004) as the key measure and explores the influences of the landscape context on social interactivity. Surveys of residents are the instrument of choice when investigating the potential relationship between a community’s landscape and the reported sense of community. This paper looks at a separate measure, “knowing,” to evaluate the level of community present in a neighborhood. Knowing is described as the ability of a resident to identify a neighbor who resides on either side or across the street from the respondent.

This paper reports the results of a research project that was conducted in the Phoenix Metro area, exploring the “threshold’s” influence on knowing within the suburban context. The threshold is defined as the barrier between the private indoor environment and the public outdoor environment, composed of walls, windows and doors. The condition of the threshold was calculated based on its transparency or level of visual access to the public from within the residence. A survey was conducted of two neighborhoods within the Phoenix Metro area with varying degrees of threshold transparency to determine the level of knowing present. Respondents were asked a number of questions related to how they use the interior of their homes, how they use the exterior of their homes, and if they were able to identify their neighbors.

As this was a small study, no conclusions can be responsibly drawn from the research results; however, the findings do illustrate a potential link between the threshold transparency and community sociability worthy of a larger study. This research lays the foundation for future explorations into environmental variables on knowing and community sociability.
Time to Garden: Reemergence of the Vegetable Garden

Elizabeth Payne Tofte, Dept. of Landscape Architecture, Mississippi State University, United States, ep523@msstate.edu
Dustin Langford, Mississippi State University, United States, dwl90@msstate.edu

Keywords: local food production systems, food security, vegetable gardening, community health, green infrastructure

This paper addresses the role of landscape architects in the ‘local food movement’ (LFM). This is a global, consumer driven, movement that has triggered a mainstream reemergence of domestic vegetable gardens in urban spaces (Birky, 2009). The LFM is built on the endurance of the domestic vegetable garden providing a secure source of healthy local food. It will be argued that LFM is not a trend, but a paradigm shift marked by an increase in permanent supporting infrastructure in the form of federal, state and local policy (Harvard Food Law and Policy Clinic, 2012; USDA 21012) and institutionalization in public education systems (National Sustainable Agriculture Coalition, 2012). Research shows that gardens directly impact mental, physical and community health (Urlich, 1999; Kaplan, 1990; Cameron, 2012). Furthermore, food security functions as a key indicator of human and community health (Corigan, 2011) and has a direct impact on policy, planning and design of urban spaces. These are key areas of influence in the practice of landscape architecture. It is hard to find evidence that landscape architects, leaders in green space design, are significantly involved in the planning, design, implementation and maintenance of domestic vegetable gardens. Preliminary research indicates that landscape architects are alarmingly unaware of changes the LFM is imposing on the urban landscape or opportunities therein.

This research asks the questions, “How are landscape architects currently involved in the planning, design and implementation of domestic vegetable gardens?” “How might they increase their participation in this movement?”

This presentation covers preliminary analysis of research data collected through phone interviews with landscape architects in practices with demonstrated work in urban planning and design throughout the southeastern United States. The purpose of this research is to establish a base assessment of current landscape architect roles and perceptions of planning, designing, implementing and maintaining domestic vegetable gardens.

It is hypothesized that there are perceived barriers to landscape architect leadership in LFM that, if removed, would create a new niche for landscape architecture in the design of healthy urban communities. This may include improving overall local food security, human mental health, physical health, community health, and creation of a more sustainable future for landscape architects and the communities and environments they serve.
Using Willingness-to-Pay to Measure Perceived Economic Values of Activity-Friendly Environments

Eric Bardenhagen, Texas A&M University, United States, bardenhagen@tamu.edu
Chanam Lee, Texas A&M University, United States, clee@arch.tamu.edu
Jun-Hyun Kim, Texas A&M University, United States, jhkim@arch.tamu.edu

Keywords: Active living environments, willingness-to-pay, perceived value, walkable communities

Background: Substantial research has provided evidence that the built environment plays an important role in promoting physical activity among adults and children. Few, however, have linked the health benefits of activity-friendly environments with economic values. This study seeks to test a willingness-to-pay method (a contingent valuation method commonly used to assess public goods) to assess the perceived economic values of activity-friendly neighborhood amenities.

Purpose: This study is to capture the willingness-to-pay values of the neighborhood amenities that can support physical activity among children and families. The amenities being assessed are selected based on being effective, sustainable, replicable, economically feasible, and commonly implemented as a part of federal Safe Routes To School projects. The specific aims are to assess how much people are willing to pay to be able to live (1) near activity-friendly amenities such as parks, trails, tree-lined sidewalks, and schools, and (2) further away from activity-hostile facilities such as industrial sites, railways, highways, and landfills.

Methods: This study will use data from personal interviews and on-line surveys scheduled to be conducted in the fall of 2012 upon the completion of an on-going pilot test. Parents of elementary school children in Austin, Bryan and College Station, and Huntsville, TX, representing urban, suburban, and rural community settings, will be recruited to participate in the study. The survey captures data on: (a) socio-demographics, (b) physical activity behaviors, (c) perceptions of current neighborhood environments, (d) future neighborhood preferences, (d) willingness-to-walk and to let their child walk, and (e) willingness to pay to live near activity-friendly amenities and further away from activity-hostile facilities. To facilitate valid and reliable assessments of the willingness-to-pay items, visual images depicting familiar existing street landscapes paired with digitally enhanced images with positive changes to better support physical activity (e.g. new sidewalks, street trees) accompany the survey items (d) and (e). The estimated willingness-to-pay amounts reported by the participants will be examined against personal covariates, and cost-benefit analyses will be conducted by comparing with costs required to make the specific amenity available or to relocate a facility.

Findings and Discussion: Based on the findings from the survey, the research team will provide evidence-based recommendations for economically feasible policy, design and planning strategies that can promote physical activity, especially walking and bicycling, in neighborhoods. By linking economic value information to existing health-related ties to activity-friendly environments, this research seeks to inform proactive community planning decision processes.
Visual Similarity and Biological Diversity of Street Trees - Seeing is Believing

Peter Trowbridge, Cornell University, United States, pjt4@cornell.edu
Nina Bassuk, Cornell University, United States, nlb2@cornell.edu

Keywords: Visual Similarity, Biological Diversity, Visual Preference

Internationally, there is a propensity for planting trees in a symmetrical manner along streets. The dilemma in this desire to have uniformly planted streets with identical or similar species of trees is that biological diversity is limited. Data from street tree assessments available in the public domain has shown that while designers and planners understand intellectually the need for biological diversity, in some states, such as California, diversity of tree species has declined (Lesser, 1996, Santamour, 1990). In other states, the total number of street trees has increased, but, the overall tree health has declined (N.J. Forest Service, 2000).

How do we create more resilient street trees in our cities and communities? How do we better select trees that have biological diversity supporting plant health and vigor while providing the visual uniformity so desired on our streets (Trowbridge, Bassuk, 2004).

This paper focuses upon the experiential qualities of our streets as related to the desire for visual uniformity of tree canopies while providing genetic diversity. This diversity becomes increasingly important given the broad regional threats of invasive species (Asian long-horned beetle, emerald ash borer) and diseases (fire blight, sudden oak death). With the increased need to provide ecological services, the health and condition of our urban forests has a growing importance.

Visual preference must be balanced with species diversity as we design, plan and manage our street trees. The continuing threats to tree health and vigor focus the need for biological diversity while fulfilling the visual cultural values of uniformity and symmetry.
Research & Methods
A Comparative Analysis of Planning Decisions about Vacant and Abandoned Lots in U.S. Cities

Leah Hollstein, University of Texas at Austin, United States, Leah.Hollstein@utexas.edu
Allan Shearer, The University of Texas at Austin, United States, ashearer@austin.utexas.edu

Keywords: Planning, Shrinking Cities, Methods, Decision-making

Title:A Comparative Analysis of Planning Decisions about Vacant and Abandoned Lots in U.S. Cities
Purpose:This investigation asks if and how urban shrinkage is influencing methods and goals of physical planning, comparing decision framing for re-using vacant/abandoned lots in growing/stable and shrinking cities within the United States.

Background:Planning theory and practice in the US has been dominated by a paradigm of growth; however, since the 1980s, many cities have faced, and continue to face, prolonged population decline, prompting questions about how shrinkage is engaged as planners attempt to provide for health, safety, and welfare. This investigation surveys and compares lines of thought, particular to planners located within cities having dissimilar experiences of “shrinking”, being used to make decisions regarding these properties. Principally, it is focused on vacant/abandoned lots to center the study around a common event. Additionally, vacant/abandoned lots are the most immediately visible symptom of population decline, offering the greatest opportunity to reimagine urban form-and-function relationships.

Methods:Current reasoning supporting decisions about vacant/abandoned lots is identified through a national survey of planning professionals in 33 cities with growing/relatively stable or shrinking populations, augmented by selected follow-up interviews. Both stratified sampling and matching were used to achieve a range of city characteristics and control for them across growth orientation. A national survey focused on shrinking cities and vacancy has not yet been undertaken; the goal is to move beyond case studies of one or two cities and attempt to understand regional trends, tools, and obstacles to progress.

Survey questions were organized according to Steinitz's six-part framework for landscape planning including: questions regarding how vacancy and abandonment are defined; how the process of vacancy is tied to explicit/implicit assumptions about vacancy; and tipping points at which action must be taken, etc.

Findings:The results indicate a range in which methods and techniques predicated on the dominant and normative growth paradigm have been both adopted or adapted for use in shrinking cities. Results suggest that concepts regarding quality of life, intentions for the future, and community goals have been reprioritized and redefined in shrinking cities. Finally, results indicate ways in which ideas regarding the built environment and the discontinuities of the urban fabric are being reconceptualized in the face of massive economic and demographic upheaval.

Importance:This work provides a compendium of contemporary practices related to vacant/abandoned lots. It provides a basis for identifying different assumptions with regards to the means and ends of planning in the context of growth and shrinkage.
A Mixed Methods Approach to Studying Creativity in Design Students

Jeremy Merrill, Kansas State University, United States, jmerrill@k-state.edu  
Sheryl Hodge, Kansas State University, United States, shodge@k-state.edu  
Stephanie Rolley, Kansas State University, United States, srolley@k-state.edu

Keywords: creativity, creativity assessment, mixed methods approach, academic intervention

This paper describes a research methodology to answer the question of how do educators measure creativity in landscape architecture students? This methodology is grounded in a Design Educator’s Model of Creativity (Merrill & Rolley, 2011), developed by the authors, as the foundation of a study exploring the effect of an academic intervention on the creativity of first year design students. The model envisions an individual engaged in their own creative process, wrapped in the cognitive sphere, within the contextual sphere, who produces a product judged by the field, using the rules of communication inherent in the domain of landscape architecture.

This paper describes the data collection techniques selected to measure student creativity, the research design employed, and the rationale behind the selection of this particular research design. This research employs both quantitative and qualitative data collection techniques to survey as many aspects of the theoretical model as possible and build a detailed description of how an academic intervention affects the creativity of students involved.

The term intervention is used as a description of the treatment condition for this research, which took place in the form of a one hour, weekly seminar class: Design Thinking and Creativity as a method of raising creativity in first year design students, similar to that introduced by Hargroves (2007). The seminar was taught in tandem with first year design studio but separate from core design classes, and is better categorized as an intervention rather than a complete overall approach to studio pedagogy. The class presented a number of different creative thinking techniques, which include but are not limited to: design process (Lawson, 2006), divergent thinking, convergent thinking, metacognition, attitudes, motivation, and the importance of the physical environment. This research uses data collection techniques being developed by the authors alongside many established instruments including: demographic survey, creative self assessment, the Figural Torrance Test of Creative Thinking (Torrance, 2006), open-ended interviews (LeCompte & Schensul, 1999), in-class design product artifacts, in-class longitudinal product assessment, instructor based creativity rating, final design project creativity rating (Amabile, 1996), researcher’s reflective journal, and field notes (LeCompte & Schensul, 1999). Future papers will address the analysis of data collected and findings of this investigation.
A Synthetically Process to Evaluate the Agritourism Landscape in Taiwan

Ying-Hsuan Lin, National Taiwan University, Taiwan, r90628311@ntu.edu.tw
Chun-Yen Chang, National Taiwan University, Taiwan, cycmail@ntu.edu.tw

Keywords: weblog articles, rural landscape re-activate, qualitative analysis, questionnaire survey

Taiwan had turned into a developing country and involved industrial development; still, there are a lot of agriculture areas on this island and now being considered as important resources which attract great numbers of tourists from urban areas. Two issues identified here for us to address. One issue is that recreation resource plays an important role in forming a satisfied experience. Past surveys were mostly done by expertise and satisfaction related to recreation resources was usually valued by on-site tourists. There is little insight into what had authentically remained in the tourists’ memories. Therefore, in this study, we explored tourists’ experiences from their spontaneously written diary. Second, for an agritourism farm land manager, it is sometimes difficult to transform knowledge of physical environment to the implemtental ways of management. Therefore, an aim on narrative mundane experience of recreational resources can provide complement knowledge.

To pursue the two goals, authentic diaries writing about experiences in agritourism farms are required. In order to understand how tourists perceive recreational resources and how these resources being spontaneously reviewed after the trip to agritourism farms, firstly, from 60 weblog articles written by tourist, we collect these data, a qualitative method was then presented here to extract recreationally resources-related concept. By open-coding the transcripts, there are 4 main categories of rural recreation resources and 18 subcategories of resources type were indentified. Four main categories are Natural Recreation Resources, Cultural and Industrial Recreation Resources, Amusement Facility and Activity, and Service System. Next, visitors were asked to report their feelings of attractions and benefits in these scenarios. Accordingly, agritourism owners were asked to respond to these scenarios about their attitude of management. Result shows that traditional rural landscapes plays important role in providing high quality rural experiences. Furthermore, differences between owners and visitors were discussed to provide landscape planners and designers a more complete understanding to the rural landscape resources. People attending this presentation may learn how to utilize an integrated evaluating process in the resource survey and site planning.
**Applying Science to Design for and Evaluate Performance**

**Barbara Deutsch**, Landscape Architecture Foundation, United States, bdeutsch@lafoundation.org  
**Mark Simmons**, Lady Bird Johnson Wildflower Center, United States, msimmons@wildflower.org  
**Danielle Pieranunzi**, Lady Bird Johnson Wildflower Center, United States, danielle@sustainablesites.org  
**Deb Mitchell**, SmithGroupJJR, United States, Deb.Mitchell@smithgroupjjr.com

**Keywords**: science-practice gap, translational research, sustainable design, landscape performance, evidence-based design, Sustainable Sites Initiative, SITES, Landscape Performance Series

In a multi-disciplinary field like landscape architecture, it is challenging for practitioners to stay abreast of and apply the range of relevant research coming from natural and social science disciplines such as horticulture, ecology, hydrology, soil science, geomorphology, climate science, economics, and environmental psychology. This session explores how science is being and could be applied in landscape architecture practice to design for, create, maintain and evaluate high-performing landscapes.

First, we reflect on the science-practice gap and opportunities for narrowing it. Through case studies from the Lady Bird Johnson Wildflower Center, we demonstrate how specific landscape performance issues in the field are addressed directly with applied science. For example, conventional practice has resulted in 50 million acres of turf in the U.S. that absorb 30%–60% of potable urban water. Recent research shows planting a multi-species native turf yields faster establishment, higher leaf density and fewer weeds, demonstrating that this major landscape feature can be sustainable.

Next, we present how relevant research can be synthesized and applied to the design of landscape projects by examining how the Sustainable Sites Initiative™ relied on the sciences, such as those related to air and water quality, energy, environmental psychology and social interaction, to develop its 2009 Rating System and the forthcoming version, slated for release in 2013.

Then, using examples from Landscape Performance Series case studies we show how published social, economic and environmental research and science-based tools have been used in the development of metrics to evaluate the performance of built landscape projects representing a range of scales, typologies, and locations.

Finally, we discuss how firms must consult new sources to seek the most reliable information related to important topics in their own field as well as that of their clients. This requires an understanding of what makes research findings credible. SmithGroupJJR shares how it is incorporating developments in hydrology, ecology, energy and economics into its practice, both on the design side and by monitoring landscape performance via collecting baseline data and conducting post-occupancy evaluations.

The panel will discuss: (1) The design community’s needs for becoming aware of, accepting, translating and adopting scientific knowledge into practice. (2) The roles researchers, educators, practitioners, and non-profits can play to narrow the science-practice gap. (3) Strategies for ensuring clients and other key decision-makers who drive demand for landscape architecture services recognize the value of translational research.
Asking the Difficult Questions: The Importance and Potential of Landscape Architectural Design Research in Exploring Answers to Complex Problems

Simon Kilbane, University of Western Australia, Australia, 19416451@student.uwa.edu.au
Gerard Siero, University of Western Australia, Australia, 18501994@student.uwa.edu.au
Sara Padgett, University of Western Australia, Australia, sarapadgett@hotmail.com
Neldner Josephine, University of Western Australia, Australia, josephine.neldner@gmail.com
Richard Weller, University of Western Australia, Australia, richard.weller@uwa.edu.au

Keywords: Projective design research, ecological connectivity, green infrastructure, landscape urbanism, systemic design, sustainable suburbia, peri-urban, phagocytosis, water sensitive cities, integrated water resource management

Seven years after the publication of the Landscape Urbanism Reader we see the eponymous movement it heralded was not just a protestant breakaway. By reintegrating the scales and techniques of both planning and design, landscape urbanism served to prepare landscape architecture for an age of ecological peril and ubiquitous urbanization. Whereas for McHarg the city was ‘God’s junkyard’ and as such the landscape could only ever be paradise lost, for landscape urbanists the city and its landscapes are conceptualized as an inextricably integrated, metabolic system. In this schema the landscape architect is, as Chris Reed declared, an “urbanistic system builder whose interests now encompass the research, framing, design and implementation of expansive new public works and civic infrastructures.”

This research offers insights into the qualities of a post-landscape urbanist theory and practice of landscape architecture.

The 5 projects are;
2. Sustainable Suburbia? (Paul Verity)
3. Peri-urban Resistance (Sara Padgett)
4. Syntropic City (Gerard Siero)
5. National Green Infrastructure (Simon Kilbane)

Josephine Neldner’s research questions orthodox visions of water sensitive urban design and proposes a synthesis of landscape urbanism and integrated water management (IWM) as a tool for the realization of a water sensitive city.

Through a process of modeling metrics Paul Verity’s research explores the spatial implications of retrofitting suburbia to achieve genuine outcomes for sustainability. Sara Padgett explores the overlooked and undervalued peri-urban fringe and proposes that it is a vital edge ecology that should directly engage with rather than passively receive future growth. Gerard Siero’s research attempts to plan and design a new city for over 1 million people in accordance with the values of deep ecology. Simon Kilbane’s research assesses the reality of a national ‘green infrastructure’ network for ecological connectivity in Australia and illustrates the spatial consequences of policy aimed at protecting biodiversity through the implementation of ecological corridors.

All these projects share a depth of enquiry into how landscape architecture, through projective design research, can apply the strategies of landscape urbanism to meet the challenges of the 21st century.
Challenges and Lessons Learned from Developing a Critical Research Practice in an Established Landscape Architecture Firm

Shimon Zimbovsky, University of Illinois at Urbana-Champaign, United States, szimbov2@illinois.edu
Craig Farnsworth, Hitchcock Design Group, United States, cfarnsworth@hitchcockdesigngroup.com

Keywords: Research in professional practice, Challenges and lessons, Research methods, Post occupancy evaluations, Academy and professional practice relationships

In the summer of 2012, Hitchcock Design Group, a landscape architecture and planning firm in suburban Chicago, embarked on an ambitious endeavor to collect data on past projects in an effort to provide evidence to inform future design work. We began with over twenty sites and reduced our research load to eight projects in three categories: healing gardens, nature-based play environments and urban landscape performance. Over the course of the summer we conducted two complete post occupancy evaluations of projects in the healing garden and nature-based play categories and developed a case study of a prominent project in the urban landscape performance category.

At the start of the summer we were faced with multiple challenges stemming from both our relative inexperience with research as well as limited precedents in professional practice. We began by reviewing earlier studies by Roger Ulrich as well as a seminal set of post occupancy evaluations of our own healing gardens by Clare Copper Marcus and Barney Barnes. Nevertheless, we were largely forced to break new ground and learn on the job.

Despite multiple challenges we were able to not only generate useful data, but also established a unique methodology and framework for future research. With respect to nature-based play environments, we conducted sixteen observations in two different Hitchcock Design Group play environments and compared our data to two traditional playgrounds in Urbana, Illinois. We employed teacher surveys and an observation framework informed by developmental psychologist, Kenneth Rubin, intended to quantify the respective play environments’ impacts on children’s development. Our findings indicate a greater incidence of higher order social play and less non-play behavior in nature-based play environments. With respect to healing gardens, we conducted ten hours of observations, in which we employed behavior mapping and visitor surveys to compare the restorative capacity of two Hitchcock Design Group gardens in one suburban hospital.

We explore the unique challenges and office culture barriers to developing a critical and reliable research practice in a long-standing and reputable landscape architecture and planning firm. Our work also has particular relevance to the academy, as we will discuss the importance of fostering meaningful research relationships between university landscape architecture programs and professional practice. By discussing our methodology and lessons learned from two former studies, our objective is to thus open the door to similar practices by other firms in the profession.
Connecting Research to Practice: Publishing Trends Over Time

Debra Flanders Cushing, Queensland University of Technology, Australia, debra.cushing@qut.edu.au

Keywords: research trends, landscape architecture, academic journals

Many scholars acknowledge the need for rigorous research in landscape architecture to improve practice and teaching (Benson, 1998; LaGro, 1999; Milburn et al., 2001; Thwaites, 1998; Selman, 1998; Zube, 1998). Yet, a recent article by Brown and Corry (2011), in which they argue for more evidence-based landscape architecture (EBLA), suggests that the profession has yet to obtain prominence as a research-oriented discipline.

While this debate continues, it is important to look at trends in landscape architecture research publications over time to provide insight into the topics that are most conducive to research and topics for which research is lagging behind or non-existent. In 2009, Powers and Walker identified publishing trends in Landscape Journal, specifically analyzing author characteristics, subject areas, and methods. Their study showed an increase in female authorship over time, as well as an increase in scholarly articles focused on history and culture.

The purpose of this study is to contribute to this conversation by looking beyond Landscape Journal to also include three prominent international landscape architecture journals: Landscape Research Journal, Landscape and Urban Planning, and the Journal of Landscape Architecture. Using content analysis methods, this paper identifies specific topic areas presented in academic articles over the last 43 years.

Preliminary findings suggest that topics such as history, plants, ecology, aesthetics, and gardens have remained popular over time. While other topics, such as technology, planning, policy, women in design, and transportation, have slowly gained prominence in the last 10 to 15 years. Still others, such as children, health, and recreation, are only covered in a minor percentage of the landscape research literature.

In addition, an issue identified in the debate is the need for research to inform and improve practice (Brown & Corry, 2011). Therefore, this paper will present a comparison between the major topics published in the four major research journals with those subject areas discussed in magazines and journals oriented to the landscape architect practitioner. This analysis will help determine which research topics are communicated directly to landscape architect practitioners and which topics get lost in translation.
Defining and Valuing Research in Landscape Architecture

M. Margaret Bryant, State University of New York, United States, mbryant@esf.edu
Lee-Anne Milburn, Cal Poly Pomona, United States, lsmilburn@csu-pomona.edu
Tim Keane, Kansas State University, United States, whisker@ksu.edu
Kathryn Gleason, Cornell University, United States, klg16@cornell.edu

Keywords: Research definition, Research evaluation, Research and Scholarship

As our public institutions of higher education are ‘privatized’ by diminished state support, all units of the academy are experiencing increased pressure to garner funding from extramural sources. In most cases, this funding is the result of faculty research efforts - whether directed at supporting traditional scholarship, teaching-related research, or community-supported outreach projects. This is particularly challenging in landscape architecture as many faculty come from practice with terminal MLA or related degrees, rather than PhDs. These faculty members are often at a loss as to what constitutes research, how they might participate in funded research, and how such work might contribute to the expectations of the academy as well as their academic careers. Likewise, landscape architecture administrators often lack metrics or comparisons with which to evaluate research conducted by their faculty, or available metrics are not applicable, or are unstated but assumed by the academy. This uncertainty makes plotting a successful course towards promotion, tenure, and a career of sustained scholarly inquiry challenging.

Our purpose here is to more clearly define research/scholarly pathways in landscape architecture and to then suggest guidelines for evaluation of such scholarship. We first examine how research is being defined or re-defined at our individual institutions and within our departments and programs (SUNY, CSU-Pomona, Kansas St., and Cornell). Questions regarding proprietary research, practice-driven research, and research to found “evidence based design” are addressed. As faculty and/or administrators with diverse perspectives and experiences in conducting and evaluating various forms of scholarship, we next speak to how “research” is being valued and evaluated in our institutions. Revealing inconsistencies in the definition and assessment of research, panelists’ presentations will point to the need for a clear definition of research in landscape architecture and guidelines as to how such research might be given value.

CELA’s current strategic plan states the goal of positioning “CELA as a leading resource for emerging knowledge in the field of landscape architecture.” Our belief is that CELA could provide great benefit to its developing, faculty-researcher members by offering a definition of research in landscape architecture and providing guidelines as to how such research might be given value. Such definition and guidelines seems a first step in establishing CELA’s leadership in landscape architectural research and in providing multiple forms of support for developing the research capacities, relationships, and communication of its membership.
Do Social, Economic and Environmental Benefits Always Complement Each Other? A Study of Landscape Performance

Yi Luo, Texas A&M University, United States, yi.luo@tamu.edu
Ming-Han Li, Texas A&M University, United States, minghan@tamu.edu

Keywords: sustainability, landscape performance

The purpose of this study is to explore whether environmental, economic and social benefits of landscapes are conflicting or converging for sustainability. The current common concept of sustainable development often discusses the benefits in the three environmental, economic and social aspects whereas their interrelationship is hardly addressed. Because landscape is an essential element in sustainable development, it is important to understand how the three benefits interact.

Rees (2003) has argued that there is an unavoidable conflict between economic development and environmental protection from an ecological economics perspective. Considering Rees’ argument, it seems that certain benefits would impede the generation of other benefits, and therefore result in tradeoffs in landscape performance. In this study, we used the 39 landscape performance case studies published by Landscape Architecture Foundation in its 2011 Case Study Investigation (CSI) program to test four hypotheses:

1. The relationship between social benefits and economic benefits is more converging than conflicting.
2. Certain social benefits will compromise various environmental benefits
3. Certain economic benefits will negatively impact the natural environment and therefore sacrifices a number of environmental benefits.
4. The aforementioned conflicts vary by project types.

The CSI program is a research collaboration of faculty, students and leading practitioners, to develop methods and quantify environmental, economic and social benefits of high-performing landscape projects. In order to test our hypotheses, we reviewed literature, made assumption, and classified landscape benefits of each case into three aspects: environmental, economic and social to analyze their compatibility and conflicts.

Our preliminary result reveals that there is little conflict between economic and social benefits. In contrast, there are some conflicts between economic and environmental benefits, and between social and environmental benefits. For example, new jobs, growing visitors and increasing property values might result in increasing population density, business development, rising traffic demands, air quality degradation, and increasing natural resource consumption. These outcomes will add extra burden to the natural environment and compromise some of the environmental benefits generated. The comprehensive study to be finished by the end of 2012 will demonstrate the interrelationship more clearly.

We anticipate that this study will draw one’s attention to the relationship among the three categories of benefits, which is rarely discussed in the landscape architecture field before. The significance of this study is that future policies on land and landscape developments will be to enhance compatibilities and reduce conflicts among the benefits to maximize the overall landscape performance.
Economic Valuation of the Activity-Friendly Environments: The Interaction Among Residential Single-family Property Values, Activity-Friendly Amenities, and Children’s Physical Activity

Minjie Xu, Texas A&M University, United States, mxu@neo.tamu.edu
Chanam Lee, Texas A&M University, United States, clee@arch.tamu.edu
Jesse Saginor, Texas A&M University, United States, jsaginor@arch.tamu.edu

Keywords: Property Value, Neighborhood Environments, Activity-Friendly Amenities, Activity-Hostile Facilities, Hedonic Price Model, Hierarchical Linear Model

Background: Neighborhood amenities (e.g. playgrounds, parks) that are safe, convenient and attractive can help increase children’s physical activity. While health and environmental benefits of such amenities have been widely discussed, their economic benefits have not been considered sufficiently. Systematic assessments of economic values/costs associated with different environmental interventions can facilitate cost-effective, evidence-based policy decisions.

Purpose: This study examines which elements/features of neighborhood environment are valued more or less as reflected in single family property values. It hypothesized that properties near Activity-Friendly (AF) amenities have higher property values, while properties near Activity-Hostile (AH) facilities have lower property value.

Methods: This study examined 32,076 single family properties covering 23 elementary school attendance zones in the Cities of Bryan and College Station, and 6,526 environmental destinations geocoded using Geographic Information System (GIS). The shortest distance from each property parcel to its nearest environmental AF or AH location was calculated in GIS. These parcel-level data were considered as the individual level variables. School performance, Census, and general land use density data were calculated in 23 elementary attendance zones, considered as the group level variables. Hedonic Price Model (HPM), Hierarchical Linear Model (HLM), and Spatial Regression Model were used to predict the economic impacts of AF/AH amenities on single family properties, while minimizing the problems of nested data structure and spatial autocorrelation.

Findings: Preliminary finding from HPM showed that single family property values were positively associated with the proximity to most AF amenities (parks, schools, sidewalk, local streets, etc.), but negatively associated with bike lane and restaurants, which were also considered as AF amenities. Property values were negatively associated with several AH facilities including railroad, landfill, and airport. From HLM, property values showed significant variations across different attendance zones. Attendance zones with higher school performance levels had higher property values; and attendance zones with higher proportion of economically disadvantaged students had lower property values.

Conclusion: The outcomes of this research can be used to support the development of policies and interventions to create safe and attractive environments to facilitate healthy outdoor activities for children and families. Such environments can help achieve the long-term goals of reducing childhood obesity and promoting public health. Further, planners and developers can use the solid empirical evidence generated from this study’s rigorous statistical analyses to justify the inclusion of diverse neighborhood amenities as means to build healthy and economically vibrant communities.
Evaluating Landscape Performance: Economic Benefits

Barbara Deutsch, Landscape Architecture Foundation, United States, bdeutsch@lafoundation.org
Bo Yang, Utah State University, United States, bo.yang@usu.edu
Dennis Jerke, Texas A&M University, United States, dennisjerke@gmail.com
Yue Zhang, Utah State University, United States, F_zhangyue2010@hotmail.com

Keywords: economic benefits of landscapes, landscape performance, academia-practice gap, sustainable design, evidence-based design, Case Study Investigation, Landscape Architecture Foundation

This panel focuses on evaluating Economic Benefits of sustainable landscapes. In today’s climate of downsizing, budget reductions and program cuts, providing proof of performance to decision-makers who impact policies, programs, investments, and land development must be a critical part of design education. Students need the skills and knowledge to quantify and communicate objective data in order for landscape solutions to compete in this burgeoning evidence-based market. Through the Landscape Architecture Foundation’s Case Study Investigation, a collaborative research program that integrates innovations of academia and practice, student and faculty research teams work with leading practitioners to document high-performing landscape projects, and develop methods to quantify economic, social and environmental benefits. Their findings are prepared as Case Study Briefs in LAF’s Landscape Performance Series, in a streamlined format based generally on Francis, 1999 that include the teams’ research methods.

LAF presents simple and effective methods utilized by CSI teams to communicate landscape projects’ ability to generate revenue, conserve energy, and produce cost savings in materials, maintenance and operations.

LAF Research Fellows and CSI participants share advanced metrics for measuring landscape’s economic attributes. Significant savings in water costs for a residential community in New Mexico, for example, were calculated by Utah State University researchers. Through conscientious site planning that increased native biomass and preserved 62% of pre-development hydrology, the community utilizes a fraction of the city’s annual water allowance.

Millennium Park, hailed as a significant model for transformative placemaking, has made a significant impact on surrounding real estate values. Texas A&M researchers combined methods to document the park’s influence on billions of dollars in subsequent residential development and premiums paid on rental units with views into the park.

Utah State University researchers assessed manifold economic benefits of four well designed U.S. urban and residential streetscapes. They now share their processes for identifying meaningful metrics and data sources for this typology, and linking landscape improvements to increased revenues and avoided costs related to energy and public safety.

The panel discussion includes:
How can researchers isolate the economic value of landscape projects on regional, city, neighborhood and site scales? Includes summaries of methods and controls used to distinguish between “typical” and “high-performance” projects.
What level of comprehension of economics does a researcher need to make substantial findings?
What are limiting factors inherent in this research?
How have firms and universities worked together to advance this body of knowledge?
Evaluating Landscape Performance: Environmental Benefits

Kristina Hill, University of California, Berkeley, United States, kzhill@berkeley.edu
Mary Myers, Temple University, United States, mary.myers@temple.edu
Barry Lehrman, Cal Poly Pomona, United States, blehrman@csupomona.edu
Ming-Han Li, Texas A&M University, United States, minghan@tamu.edu

Keywords: environmental benefits of landscapes, landscape performance, academia-practice gap, sustainable design, evidence-based design, Case Study Investigation, Landscape Architecture Foundation

This panel focuses on some of the numerous Environmental Benefits of sustainable landscapes. Determining appropriate metrics for evaluating a site is often part of the challenge. As performance data related to environmental function is increasingly requested by clients, agencies, and policymakers, knowing how to measure and communicate environmental benefits is essential.

Through the Landscape Architecture Foundation’s Case Study Investigation, a collaborative research program that integrates the innovations of academia and practice, student and faculty research teams work with leading practitioners to document high-performing landscape projects, and develop methods to quantify environmental, economic and social benefits. Their findings are prepared as Case Study Briefs in LAF’s Landscape Performance Series, in a streamlined format based generally on Francis, 1999 that include the teams’ research methods.

LAF Research Fellows and CSI participants share their expertise, insights and some of their methods for evaluating Environmental Benefits. Determining a site’s ecological integrity and communicating the findings in a meaningful way, for example, are challenges for many advocates of sustainable landscape design. Temple University researchers have successfully demonstrated both by utilizing tools to calculate biodiversity and putting the findings into meaningful perspective. Cal Poly Pomona researchers developed energy-nexus calculators to convert the latent heat of water into energy equivalents and determined the amount of cooling by evapotranspiration and associated energy savings. When applied to the community near the West San Gabriel River Nature Trail, the reductions to resident energy bills were significant.

A residential community developed on former pasturelands sought a new regional identity defined by its interconnected coastal prairie and bottomland forests. Texas A&M researchers analyzed water and soil samples for correlations with the contiguous massings of native grasses, reforestation and wetlands. Their findings reveal the role time plays in landscape performance. Kristina Hill, PhD, Associate Professor at University of California - Berkeley and LAF Vice President of Education concludes the discussion on performance benefits and metrics. Kristina discusses strategies and design opportunities that respond to climate change and address social justice, and shares some thoughts on related evaluative methods for landscape performance.

The panel discussion includes:
How might researchers, firms, students determine appropriate environmental metrics for sites of differing scales?
How have landscape architects worked with allied researchers to design for and monitor positive environmental outcomes?
How is landscape performance data being used and by whom?
What are strategies for building relationships with practitioners and fitting this research into the academic calendar?
Evaluating Landscape Performance: Social Benefits

Linda Ashby, Landscape Architecture Foundation, United States, lashby@lafoundation.org
Victoria Chanse, University of Maryland, United States, vchanse@umd.edu
Bo Yang, Utah State University, United States, bo.yang@usu.edu
Byoung-Suk Kweon, University of Maryland, United States, kweonb@umd.edu

Keywords: social benefits of landscapes, landscape performance, academia-practice gap, sustainable design, evidence-based design, Case Study Investigation, Landscape Architecture Foundation

This panel focuses on evaluating Social Benefits of sustainable landscapes – benefits which are often difficult to capture as they can be connected to ethereal qualities that make a landscape special. These qualities can be hard to define, and harder to quantify. But landscape performance data can originate from surprisingly simple resources.

Through the Landscape Architecture Foundation’s Case Study Investigation (CSI), a highly collaborative research program that integrates the innovations of academia and practice, student and faculty research teams work with leading practitioners to document the benefits of high-performing landscape projects, and develop methods to quantify social, environmental and economic benefits. Their findings are prepared as Case Study Briefs in LAF’s Landscape Performance Series, in a streamlined format based generally on Francis, 1999 that include the teams’ research methods.

LAF presents simple and effective ways CSI teams gather social information, through such tools as monitoring reports, POEs, GIS analysis, interviews, and measuring devices, and shows that with some investigation, more information may already exist about a project than is realized.

LAF Research Fellows and CSI participants share more advanced methods for approaching Social Benefits. Preserving cultural heritage, for example, is an important aspect of landscape architecture, but not intuitive to quantify. University of Maryland researchers created a framework that includes traditions, local materials and aesthetic character when researching the social aspects of a Tuscan estate.

Scenic viewsheds contribute significantly to visitors’ experience of a place, but calculating their social value is elusive. Utah State University researchers reveal how viewsheds were simulated and analyzed for a Lake Tahoe redevelopment project, and how the final design doubled the Scenic Unit Rating and enhanced the character of the town.

A landscape’s quality can help drive demand for client services. University of Maryland researches investigated an urban elementary school and tracked how changes to the schoolyard helped increase demand for enrollment as it transitioned from a landscape dominated by hardscape and lawn into a LID outdoor classroom.

The panel discussion will include:
How can the social value of high-performing landscapes be shown at differing scales: regional, city, neighborhood, site? Includes summaries of methods and controls used to distinguish between “typical” and “high-performance” projects.
What level of comprehension in the social sciences is needed to make substantial findings?
What are limiting factors inherent in this research?
How can firms, landscape architecture departments and allied disciplines work together to advance this body of knowledge?
Fabricating Landscape Surfaces: Redefining Digital Design and Fabrication Techniques for Landscape Architectural Applications

Brian Osborn, University of Virginia, United States, osborn@virginia.edu

Keywords: computer-aided design, computer-aided manufacturing, digital design, digital fabrication, associative modeling, landscape surfaces, landscape process, construction methods, material selection

Computer-Aided Design (CAD) and Manufacturing (CAM) technologies have become prevalent in architectural design practice and education. Digital techniques afford increased ability to manipulate geometry and to produce highly articulate form toward both performative effect and experiential affect. This paper will explore methodologies for redefining digital technologies for Landscape Architectural applications through the production of landscape surfaces such as paving, drainage and retaining systems.

Often applied toward the production of architectural surfaces, i.e. applied finishes, free-standing screens, and high-performance building envelopes, digital techniques promote a methods-and-materials first design approach through which the protocols of manufacturing processes and/or inherent material properties become principal project considerations and establish the parameters for driving form. Through animation-based, and/or associative (parametric) modeling, the final formal composition of any project proposal represents only a single, optimized, instance of an otherwise differential model that is capable of adjustment to suit a range of conditions.

Landscape surfaces, such as paving, drainage, and retaining and erosion control systems, are thickened by an inexorable interaction with the flow of environmental processes over, through, and under them. The necessity to consider physical form relative to ecological processes requires a reciprocal consideration for performance in terms of mutability, durability, and longevity in the development of materials and manufacturing methods for landscape applications. Borrowing from the “bottom-up” computational design methods already established in Architecture, the use of animation-based and associative modeling software enables landscape designers to modulate material effects with respect to site conditions that change over time. When applied to landscape surfaces, the resulting form presents solutions that anticipate and support environmental processes while creating unique and memorable places for human habitation.

Organized around three landscape surface typologies: PAVE, DRAIN, and RETAIN, this paper outlines an approach to integrating digital design and fabrication techniques into Landscape Architectural practice and education through a presentation of prototypical works completed through faculty and student collaboration as well as through the findings of a series of research seminars on the topic. Faculty and student projects are documented through material tests, design drawings, models, and diagrams, and full-scale installations.
Food-shed: Re-envisioning the Food Network both Inside and Outside of Hong Kong

Qian Zhang, University of Hong Kong, Hong Kong, zhang.qian@hku.hk
Jingjing Zhang, University of Hong Kong, Hong Kong, zhangjj04@gmail.com

Keywords: Food-shed, food network, Hong Kong, Mapping, Spatial Analysis

PURPOSE: This presentation aims to re-envision the food network both inside and outside Hong Kong through an overview of food supply, collection, distribution and consumption in current and historical situations.

BACKGROUNDs and METHODS: Food in Hong Kong is famous because it is delicious, fresh, affordable and there is a large variety of choices. But when we looked into the topic of food deeper, millions of tons of carbon emissions are released. In 2010, Hong Kong spent 4.40% of its GDP (around 14.1 billion USD, no.1 worldwide) on food imports. (The United Nations Food and Agriculture Organization Global Report, 2010.) At the same time, 95% of the food supply in Hong Kong is imported, and has experienced a 15% food average volatility growth rate in the past seven to ten years.

Meanwhile, food related issues are more concerned in Hong Kong recently. People from both public society and academic fields examine possibilities including but not limited to food waste, community garden, food charity, organic restaurant and edible roof. This research collects materials in person by visiting and interviewing with various people in the fields above. Most of these practices interconnected with each other, for example, the Feeding Hong Kong is a food charity organization which also concerns the food waste and community services. Mapping will be cited as the main method in this research.

FINDINGS & IMPORTANCES: Hong Kong’s food network is comprehensive due to its food import politics, economics, distribution systems, and food culture. The findings include historical cultivation culture and map, food supply and consumption statistics, food collection and distribution system, and related local food services. Most of the food sold to the consumers and restaurants is from supermarkets and wet markets, which only import food in specified types and sizes. Local farming is getting more and more popular, but the impact on the food network is limited.
Geomorphic and Human Induced Factors of Subwatershed Types in Kentucky

Brian Lee, University of Kentucky, United States, blee@uky.edu
Angela Schörgendorfer, IBM T.J. Watson Research Center, United States
Corey Wilson, University of Kentucky, United States

Keywords: Watershed and Landscape Characterization, Geospatial Methods, Publicly Available Data

Watershed boundaries rather than political boundaries are advocated to address a variety of land/water resource issues. Effective watershed assessment processes are needed that classify watersheds by geomorphic and human modified landscape scale characteristics. This interactive presentation demonstrates an approach that utilizes publically available geospatial data to visualize landscape indicators to describe watersheds. Initial grounding for this work can be found in Jones et al. (1997). By viewing the landscape from a watershed perspective, this research is intended to present an understanding of how to distill an abundance of data into discrete landscape typologies for insight into how to begin formulating a statewide watershed based planning framework and priority setting system.

The primary benefit of characterizing the landscape from a watershed perspective is the ability to recognize the human influenced impacts using a flexible data approach (Hawkins et al., 2000; Patil, 2002). These data can be used as a tool to identify landscape characteristics that are relevant to land management decisions particularly when water resources are concerned. For example, when watershed plans need to be made to reduce nutrient loading or identifying restoration potential (USEPA, 2005). A watershed-based approach for making decisions requires cities, counties, and states to recognize that though they may appear to be distinct entities, ecological features and processes connect them. This is an inherent argument for land decisions to be made with watershed characterizations in mind.

This research used the Hydrologic Unit Code (HUC)14 watersheds as the fundamental unit of analysis. Each of the 9,109 Hydrologic Unit Code (HUC) 14 subwatersheds spanning 13 river basins in Kentucky was characterized using over 100 indicators. An iterative, semi-automated process through ModelBuilder of ArcGISv.10 and publically available data was used. Statistical cluster analysis using the Ward Clustering Method was utilized to identify similar subwatersheds after indentifying 12 landscape indicators that did not fail the correlation analysis test for multicolinearity. The indicators used to the cluster analysis included subwatershed size, topographic roughness, landscape flow accumulation, wetlands, sinkhole density, impervious cover, impervious cover change over five years, forest cover, forest cover change over five years, crops on slopes of three percent or greater, topographic change, and stream density. The statistical clustering identified 13 subwatershed types. These data and statistical approach are anticipated to lead to a better understanding of subwatersheds as well as implementation and management opportunities and constraints.
Green Roof Performance Study: Puget Sound Region

Benjamin Spencer, University of Washington, United States, bspen@uw.edu
Ken Yocom, University of Washington, United States, kyocom@uw.edu

Keywords: green roof, stormwater detention, design strategies

Green roof infrastructure is rapidly becoming a hallmark of sustainable building strategies in the U.S. and globally. The environmental performance and associated benefits of green roof infrastructure has been widely disseminated in the environmental performance literature (Spolek 2008, Getter and Rowe 2006, Liu and Minor 2005). Particularly green roofs have been found to reduce stormwater runoff, decrease ambient temperatures and building energy consumption, and increase local biodiversity (Oberdorfer et. al 2007).

Known as a community that supports urban sustainability issues, Seattle is promoting green roof infrastructure through regulatory and incentive based development strategies such as the Seattle Green Factor. A recent survey of green roofs in Seattle identified 62 buildings with existing green roofs; a total area of nearly 360,000 ft2 (McIntosh 2010). While the number of green roofs in the area expands, few regional studies have been conducted to assess their performance for reducing total and peak stormwater volumes and delaying peak flows.

The University of Washington Green Roof Performance study (GRP) was initiated to assess the hydrological performance of extensive green roof infrastructure for the Seattle metropolitan region. The study is evaluating continuous hydrological data from five (5) experimental panels (600ft2) to determine the capacity of green roof design strategies to alter the quantity and timing of runoff. Three of the panels are multi-layer systems, one is single-layer, and the other a tray system. The profile of each multi-layer panel is distinct using different retention materials and variable soil depths (4 - 6").

Through one year (March 2011 through February 2012) of data collection the panels, in total, retained 30 – 56% of precipitation. During the regionally dry months (July and August) the panels retained 95 – 99% of all precipitation. However during the wet season performance dropped considerably with retention rates ranging from 28 – 55%. As expected, peak volumes and delay were strongly correlated to soil moisture conditions; however during the most common storm events (0.01 – 0.25) peak volumes were reduced 66 – 87% and peak delays ranged from 2 to nearly 4 hours.

In general, the multi-layer systems with the deepest profiles (6") performed the best while the system with the shallowest profile (4") retained the least amount of precipitation with the shortest peak delay. The single-layer and tray systems performed moderately across all relative measures. This presentation will outline the methods used for this analysis, discuss detailed results, and present possible policy implications.
Investigating Social Disparities in Urban Canopy Availability and Park Accessibility

Xiaolu Zhou, University of Illinois at Urbana-Champaign, United States, xzhou11@illinois.edu
Jinki Kim, University of Illinois at Urbana-Champaign, United States, jinkikim@illinois.edu

Keywords: park, tree canopy, GIS, accessibility, spatial equity

Easy access to green space and the presence of lush tree canopy in neighborhoods provide substantial psychophysical benefits to residents (Velarde et al., 2007; Zhang et al., 2011). However, these urban amenities are often unevenly distributed between white and racial/ethnic minority residents (Boone et al., 2009; Lotfi and Koohsari, 2011). In this study, we investigated racial/ethnic disparities in access to parks and tree canopy using a geographic information system (GIS) and remote-sensing techniques in six Illinois cities. An accessibility index based on a new Google Maps application programming interface (API) was used to calculate walking distances between points of origins and parks, and integrated classification techniques were applied to calculate the amount of tree canopy. Kernel-smoothing function was applied to both canopy and park layers to transform point value to continuous surface value. Both ordinary regression and spatial regression were used to find the relationship. The results of this study show that racial/ethnic minorities have less tree canopy in their neighborhoods, but it did not find significant differences in terms of access to parks. Spatial regression was determined to be an effective modeling approach for the data used in this study. Methods used in this project can be extended to study accessibility to various destinations using different means of transit. The results reveal inequities in terms of the availability of green space, it also points out where these disparities exist. Hence, intervention can be targeted to specific places. This study can provide guidance to urban planners and landscape architects to uphold environmental justice of equal access to urban greenness.
Making a Case: Strategies for Developing Landscape Performance Case Studies

Jessica Canfield, Kansas State University, United States, jesscan@ksu.edu
Bo Yang, Utah State University, United States, bo.yang@usu.edu

Keywords: landscape performance, case study, multifunctional landscapes, Landscape Architecture Foundation, methodology

As an evidence-based design discipline, landscape architecture is increasingly dependent upon empirical evidence to inform design and guide decision making (Brown & Corry, 2011). The Landscape Architecture Foundation (LAF) Case Study Method has been recognized as an effective tool to document best design practices and to disseminate landscape architecture research (Francis, 2001). However, previous studies using this method may be limited if sufficient empirical evidence is unavailable or critical analysis is not provided. To augment the existing LAF Case Study Method and further advance the development and documentation of empirical evidence, in 2011 the LAF launched the Case Study Investigation (CSI) Program, as part of the Landscape Performance Series (LPS). The intent of the program is to bring academics, students, and practitioners together to collaboratively develop case study briefs which reveal the sustainable features of high-performing designed landscapes. Central to the LPS case study briefs are quantified environmental, social, and economic benefits, which are intended to illustrate the “value” of sustainable design to a broad audience (Landscape Architecture Foundation, 2011). Yet, as this new type of case study begins to take hold, strategies are needed to help guide and structure the procurement of content related to landscape performance. In this presentation, we will present strategies for creating landscape performance case studies, including methods to identify metrics targeted for different performance benefits, methods for data collection, and methods for content assembly. Both authors have twice participated as Research Fellows in the CSI Program and have collectively produced a total of eight landscape performance case studies. We will use a selection of these works to illustrate our strategies. In addition to helping guide future landscape performance case studies, our presentation will further discourse on post-occupancy performance evaluations, as well as inform future design considerations.
Measuring Gully Erosion in Two Disturbed Midwestern Landscapes

Katie Burke, Kansas State University, United States, katiejburke@gmail.com
Tim Keane, Kansas State University, United States, whisker@k-state.edu

Keywords: gully erosion; land management; Midwest

Gully erosion is a world-wide problem that creates human safety hazards, soil loss, and sediment and nutrient pollution. Gullies often form as a result of land use changes and interrelated factors such as soil compaction, vegetation removal and reduced rainwater infiltration. The Midwestern United States has somewhat unique conditions for gully initiation and growth: deep, erodible soils, sporadic intense rainfall events, and heavy agricultural land management that usually increase erosion rates.

This presentation describes the study of gully initiation and development in two types of disturbed landscapes in Kansas – military training areas and agricultural fields. Our research priority is to understand gully erosion in order to predict where gullies form and how they grow. In both land use settings, heavy machinery alters the land surface, often leaving it exposed and unprotected from rainfall. With field-collected data and an understanding of region-specific gully erosion processes, our research will help inform land management strategies in our study locations. Such knowledge could then be extended to gully prevention and control in landscape development or rehabilitation.

Our first project goal is to measure gully growth with surveying equipment to detect changes in gully size, sediment volume and rates of change over time. Cross sections at critical points along monitored gullies, such as above and below head-cuts or at active erosion areas, will be resurveyed after every major rainfall/runoff event. Surveying after rainfall events will allow us to correlate rainfall/runoff data to gully growth rates. Head-cut locations will also be measured to monitor growth or uphill expansion (head-ward migration). Longitudinal profiles of the gully beds will be surveyed yearly to detect aggradation or incision. Our second goal is to evaluate potentially contributing environmental factors that might explain gully growth, such as soil characteristics, antecedent moisture conditions, vegetative cover, slope, and drainage area.

With both direct field measurements and environmental characteristic data, we will then attempt to correlate rates of gully growth to driving environmental forces. Regression analysis will show whether or not our attempt to find relationships is successful; through statistics, we will hopefully be able to better predict where gullies form and how they change over time. We hope to find remote-sensed correlates to gully process variables so as to predict gully initiation before tillage or training operations take place. Finally we hope to design innovative, sustainable gully mitigation measures for the military training lands and agricultural fields of the Midwest.
On the Research Front: 2012 Landscape Architecture Foundation Case Study Investigation and the Case of Streetscape

Bo Yang, Utah State University, United States, bo.yang@usu.edu
Yue Zhang, Utah State University, United States, f_zhangyue2010@hotmail.com
Pamela Blackmore, Utah State University, United States, p.b@aggiemail.usu.edu

Keywords: Sustainability, post-occupancy evaluation, Design Workshop, Conservation Design Forum, ecosystem services, social benefits

The demonstration of landscape performance benefits has become increasingly important in landscape architecture practice and in communicating to interdisciplinary audiences. The Landscape Architecture Foundation (LAF) launched its Case Study Investigation (CSI) program in 2011 to exemplify the performance benefits of best design practices. The 2012 CSI program further poised the LAF on the research front via becoming more rigorous in case study selection, encompassing a broader spectrum of sustainability metrics (e.g., projects must document social, environmental, and economical benefits), and emphasizing the importance of social benefits, which has yet to become a strength of landscape architects. This presentation will introduce four built streetscape projects investigated in the 2012 CSI program, including a large-scale permeable pavement project in Charles City, Iowa, and American Society of Landscape Architects’ award-winning projects in Missouri, California, and Colorado. Several compelling performance benefits of these projects will be presented, such as safety and accessibility, visual resource and aesthetics enhancement, and water and energy conservation. The social benefits of the South Grand Boulevard in St. Louis will be emphasized. Landscape architecture firm Design Workshop worked with the Missouri School for the Deaf and the Missouri School for the Blind, the major schools in the project site, to improve ADA accessibility at all intersections to 100%. Revised streetscape design and visual and audio cues help orient the visual and hearing impaired students and allow them to familiarize themselves with urban environments. In addition, as a result of the revised design, the traffic speed was reduced, from 42 mph to 25 mph and the probability of pedestrian fatality on vehicular impact was reduced from 100% to 25%. Related benefits include an 85% decrease in traffic accidents and an expected $2.69 million savings in medical care for the city of St. Louis over the next 25 years.
Panel: State of CELA Research Initiatives

Patrick Mooney, University of British Columbia, Canada, pmooney@sala.ubc.ca
Ming-Han Li, Texas A&M University, United States, minghan@tamu.edu
Christopher Ellis, University of Maryland, United States, cdelis@umd.edu
Taner Ozdil, University of Texas at Arlington, United States, tozdil@uta.edu
David Pitt, University of Minnesota, United States, pittx001@umn.edu
Pat Taylor, University of Texas at Arlington, United States, pdt@uta.edu

Keywords: Research in Landscape Architecture, research trends

The purpose of this panel is to provide the state of CELA’s research initiatives. This panel is intended to be the inaugural one of future regular updates. CELA has been initiating and implementing several key research-related initiatives in recent years. They include the establishment of the Academic Information System in 2008, the conference track system in 2008, the creation of the Vice President for Research (VPR) position in 2009, the continuation of online abstract submission for CELA conferences, and so on. In 2010, the CELA executive board under the former president Elen Deming’s leadership launched a new strategic planning process. One of the four key themes resulting from the strategic planning process is that of research: “CELA will serve as a leading resource for emerging knowledge in the field of landscape architecture (CELA 2012).” As CELA strides towards this goal, it is imperative to inform CELA members and conference attendees of the state of CELA’s research initiatives. The panelists and the initiatives/tasks on which each will report include:

• Patrick Mooney (CELA President): overview of the results of the strategic planning research committee

• Ming-Han Li (VPR): state of the current research related tasks and initiatives, including conference tracks, full paper and abstract review and publication process, and research problem statements

• Christopher Ellis (past VPR): reflection of the past two conferences, including total number of attendees, international representation in conferences, abstract submissions, reviewers, growth of student participation, etc.

• Pat Taylor and Taner Ozdil (Academic Information System managers); overview of CELA schools on research related metrics

• David Pitt (Editor of Landscape Journal): Landscape Journal’s outlook
Perception of a Functional Wetland Landscape in a Senior Living Community

Mary Myers, Temple University, United States, mary.myers@temple.edu
Allison Arnold, Temple University, United States, allisonlarnold@gmail.com

Keywords: wetland, social metrics, survey

Studies have linked physical activity to improved health and feelings of social connectedness in senior living environments. Kweon, et.al. (1998) linked green space to improved social integration for seniors living in Chicago’s public housing projects. Tyvimaa (2011) studied seniors in Finland finding that social engagement and interaction is “directly related to the design of buildings, common areas and outdoor spaces” (Tyvimaa, 201). Kerr, et.al. link health and quality of life to increased physical activity in senior living communities.

This research attempts to quantify the perceived social benefit of an ecologically designed landscape, rather than a standard “park-like” or urban landscape. The study was conducted as part of the Landscape Architecture Foundation case study research initiative. The landscape, 13-acre multifunctional wetland landscape at a retirement community in Newtown, PA was developed to infiltrate stormwater coming from the site, adjacent properties and outlying areas. It was designed as a sinuous riparian “park” with connected wet meadows, swales and basins, and planted with grasses, trees and shrubs native to Pennsylvania. A universally accessible trail system was incorporated to afford access to pedestrians, and people using walkers and wheelchairs. The entry drive to the facility is also routed to wind through the wetland, taking advantage of its views. The wetland landscape has been in place for approximately ten years and has won several national and regional design awards. (ASLA ACE, PA/DEL ASLA).

We wished to understand how current residents and staff use the wetland landscape and whether it contributes to their perceived quality of life at this facility. A survey questionnaire was prepared, based on measures developed by Barbosa et.al.(2007); Cooper Marcus and Barnes (1999) Sherman, Varni, Ulrich and Malcarne (2005); Grahn and Stigsdotter (2010). The survey included demographic, self rated health and experiential questions. A total of 74 respondents, 9.37% of the total combined 789 resident/employee population completed the questionnaire.

A majority, 63%, (n=42) of respondents said that the wetland landscape definitely increased their satisfaction with Pennswood as a home/workplace. 15% (n=10) indicated that it probably increased their satisfaction with Pennswood as a home/workplace. A majority, 61% (n=34) of respondents said that their mood was more positive after being in the wetland landscape. The significance of the study is that it indicates the opportunity for social benefits to be associated with a highly performative stormwater wetland.
Photography as a Medium of Inquiry

Anne Whiston Spirn, Massachusetts Institute of Technology, United States, spirn@mit.edu

**Keywords:** visual thinking, photography, research methods

Landscape architects use photography primarily for documentation, communication, and self expression and rarely for creative thinking and critical reasoning. But photography, like drawing, can be a way of thinking about landscape, a means to read a landscape, to discover and display processes and interactions, and to map out the structure of ideas. This paper will explore how the practice of photography can be a form of inquiry.

Photography was from its inception a medium of thought and inquiry; it became an art form soon after. For its inventor, Henry Fox Talbot and for his contemporary who coined the word, astronomer William Herschel, photography was a research method. Since then, many others have employed photography to explore ideas about space, time, and landscape: anthropologists Margaret Meade and Gregory Bateson; Dorothea Lange and her husband, the economist Paul Taylor; artist David Hockney; sociologist Camilo Vergara; landscape architects Alan Berger and Anne Whiston Spirn. This paper will present a variety of visual thinking strategies with their application to research illustrated through the work of landscape photographers introduced above: pattern-seeking, repatterning, rotation, reproportion, relabeling, grouping, pairing, and sequencing. The paper will then explore the use of photography to develop hypotheses and test ideas as illustrated by two case studies: Drosscape, by Alan Berger, and The Language of Landscape by Anne Whiston Spirn.

Learning Objectives include: explore how others have used photography as a tool of discovery; learn strategies and techniques for using photography as a research method; understand how to integrate photographic inquiry into your own research.
Quantifiable Landscape Performance Benefits: The case of Brent Elementary School

Mark Storie, University of Maryland, United States, mstorie611@gmail.com
Byoung-Suk Kweon, University of Maryland, United States, kweonb@umd.edu
Christopher D. Ellis, University of Maryland, United States, cdeulis@umd.edu

Keywords: Landscape Architecture Performance, Quantifiable Benefits, Social, Environmental Benefits

Safe and Healthy school environments are critical for children to learn, play and grow. National efforts to build and improve new and existing school environments include the U.S. Environmental Protection Agency first national level school siting guidelines in 2011 mandated by the Congress. Also, the Obama administration announced the first-ever 78 Green Ribbon Schools in 29 States and Washington, DC in 2012. The Landscape Architecture Foundation (LAF) is seeking to document quantifiable landscape benefits through the Landscape Performance Series (LPS). This study is one of the Case Study Investigations funded by LAF and the purpose of the study is to quantify the economic and environmental benefits of sustainable landscape improvements, and assess the social benefits of school yard greening in a public school.

The study, conducted in the summer of 2012, sought to quantify the social, economic, and environmental benefits of landscape performance at Brent Elementary school located in Washington, D.C. We measured environmental benefits (e.g., carbon sequestration, stormwater infiltration using existing benefit calculators such as the U.S. Forest Service’s I-Tree and USDA’s TR55. We also measured changes in surface and air temperatures throughout the day for asphalt and raingarden. Social benefits were quantified by comparing before and after the landscape construction which was provided by the District of Columbia Public Schools. This data included test scores, attendance rates, parent and teacher satisfaction and enrollment waitlists. Additional data was gathered through interviews with parents, school staff and the landscape designer.

Sustainable landscape design solutions produced many economic and environmental benefits. Economic benefits for this project were directly attributed to the nearly $300,000 in grants awarded to the school to finance implementation, as well as over $17,000 in savings on annual grounds maintenance through organized volunteer groups and seasonal events. Environmental benefits include: reduction in atmospheric carbon dioxide by almost 500 pounds, interception of 2,400 gallons of stormwater annually, and decreased local air and surface temperature. Social benefits observed in post-occupancy data include increased parent and staff satisfaction, and increased demand for student enrollment. Although this initial investigation cannot directly link landscape improvements to social benefits, the landscape was the primary focus around which other activities were planned.
Reconstruction of the "Vegetation-Bearing Architectonic Structure and System (1938)"

Richard Hindle, University of Illinois, United States, rlhindle@illinois.edu

Keywords: Patents, Vertical Garden, Reconstruction, Design, Materials, Modernism, Stanley Hart White

The “Vegetation-Bearing Architectonic Structure and System” is the first known patent for a vertical garden, patented by Professor Stanley Hart White on April 5th, 1938. White’s invention is seminal in the history of vegetation-bearing architecture, establishing precedent for the contemporary vertical garden in the pre-war Middle West. The green wall, or Botanical Brick, was conceived of by White as a solution to the problem of modern garden design and represents a significant contribution of Landscape Architecture to notions of a verdant modernism. This presentation documents research, supported by a Graham Foundation Award (1), for the reconstruction US patent 2,113,523. Methods discussed in this presentation include interpretation of patent documents, analysis of historical writings from Stanley White’s personal Journals, material studies, and design processes leading to the reconstruction of the patent by the Horticultural Building Systems Lab at the University of Illinois Urbana-Champaign. Recent scholarship establishes the historical and intellectual context of the “Vegetation-Bearing Architectonic Structure and System” (2), yet Professor White may be credited with another important contribution, that of the Landscape Architect as innovator and inventor. This contribution is especially salient to contemporary practice as our trajectory towards ecological and landscape urbanisms is in part dependent on emergent technologies. The role of innovation and technology will be discussed in the context of the reconstruction and as part of a broader approach to technological innovation in design pedagogy.
Reforestation the Reclaimed Appalachian Coal Mined Landscape Over Space and Time

Brian Lee, University of Kentucky, United States, blee@uky.edu
Christopher Barton, University of Kentucky, United States, Barton@uky.edu
Corey Wilson, University of Kentucky, United States

Keywords: Coal Mine Reclamation, Scenario Modeling, Enhanced Land Evaluation and Site Assessment, LUCIS

This interactive presentation demonstrates the process of how people consciously sped up the changing of landscape through decades of surface coal mining across an estimated million acres to create uniquely identifiable places in Appalachian landscapes. Now, people are planning to speed up the process of forested landscape recovery using ecological theory, expert opinion, and computer based scenarios. The forest planting scenarios in this study simultaneously focus on reconnecting existing forest blocks, enlarging interior forests, improving hydrologic conditions, biofuels production, and anticipating future fossil fuel energy production.

Past mining activity have created a landscape providing limited ecosystem function and are potentially available for reforestation activity. In addition, there is a potential opportunity to use this research to strategically offset atmospheric carbon emissions by coal-burning electric-power producers should regulations change. It is established that productive post-mined soils reforestation can produce a measurable carbon sink (Amichev et al., 2008). Forests growing on mine sites can sequester three to five times more carbon than how these legacy mine sites were originally reclaimed (Burger and Zipper, 2009). Using the Appalachian Landscape Conservation Cooperative Boundary (US Department of the Interior, 2012) as the study area, this land use suitability problem lends itself to the use of multiple weighted overlay models and submodels using a Land Evaluation and Site Assessment framework (Pease and Coughlin, 1996) based on expert opinion developed through a Delphi Process (Cuhls, 2007). The raster based overlay analysis considered multiple landscape factors and combined thematic sub-suitability analyses to produce an overall suitability map identifying valuable places to target on-the-ground reforestation efforts for strategic habitat conservation and conservation design (US Geological Survey and US Fish and Wildlife Service, 2006).

When applied across the landscape, a suitability rating for each factor was determined for each 30 meter x 30 meter portion in the context of the surrounding landscape as well as the Hydrologic Unit Code (HUC) 12 subwatershed of the cell. All factors were initially weighted based on the literature review as well as professional expertise and combined to produce an overall comprehensive suitability rating encompassing all sub-suitability analyses. The scenario modeling approach also allows for the identification of competing conservation interests (Carr and Zwick, 2007) thereby allowing collaborative decision-making. Overall, the study’s importance is the identification of critical areas to invest limited financial and organizational capacity resources for ultimately improving ecosystem function for societal needs.
School Siting Policies: Identifying a Healthy and Safe Learning Environment

Amy Marin, University of Maryland, United States, amarin@umd.edu
Byoung-Suk Kweon, University of Maryland, United States, kweonb@umd.edu
Paul Mohai, University of Michigan, United States, pmohai@umich.edu
Sang Yun Lee, University of Michigan, United States, sangyunl@umich.edu

Keywords: School Siting, Learning Environment, Education Policy, Safety, Health

As public concern for students’ health and safety in the school environment continues to increase, it is beneficial for public officials to consider a number of natural and artificial environmental hazards when siting a new school. Choosing the right physical environment in which to locate a school is key to promoting students’ health and academic success. Many schools are located near environmental hazards, contributing to the poor health of students and interrupting the learning process. A Michigan investigation reported that the schools located in areas with the highest levels of air pollution had the lowest attendance rates and the highest percentage of students who failed to meet state educational testing standards. (Mohai, et al. 2011) When examining the effects of traffic-related air pollutants on children’s health, a study concluded that a school’s proximity to a freeway is a valid estimate of the students’ exposure. (van Roosbroeck et al. 2007) By implementing school siting policies, the school setting might provide a safe and a supportive, learning environment. 30 states across the country are passing legislation that guide the school site selection committee, made up of school officials, architects, landscape architects, urban planners, engineers, etc., in deciding where to locate a school. The remaining 20 states lack any form of school siting policy. (Rhode Island Legal Services 2006)

This research is intended to explore individual states’ school siting policies. California and New Jersey are at the forefront of implementing these policies. State laws and regulations were reviewed to search for all relevant school siting policies. In addition, a series of telephone interviews were conducted with state government agency officials to assess the full extent of California’s school siting regulations. This research studies states’ screening and ranking criteria for inspecting a new school site or an addition to an existing school site; what environmental factors, such as site shape, topography, and accessibility, are considered; and which public and private entities participate in the selection process. Results from this research indicate that California and New Jersey’s school siting policies lack the following: specific details regarding distances, levels of contamination, etc. for selection guidelines, cooperation between acting government agencies during the selection period, and the public’s involvement in the approval process. The presentation will share the information gathered and provide recommendations for successful and thorough school siting criteria so that the physical school environment can be more conducive for a healthy, learning environment.
Stormwater Runoff from a Small Integrated Green Roof System at Kansas State University: A Review of Data Gathered over Parts of Four Years

Lee Skabelund, Kansas State University, United States, lskab@ksu.edu

Keywords: integrated native plant green roofs, monitoring stormwater runoff

It has been shown that green roofs play an important role in reducing stormwater runoff (Morgan, Celik, and Retzlaff 2012; Nagase and Dunnett 2012; Czerniel Berndtsson 2010; Carter and Jackson 2007). However, limited stormwater runoff data has been gathered and published for integrated semi-intensive green roof systems in the United States’ Great Plains or other drought-prone climates where summertime thundershowers often create very heavy rainfall events.

On May 19, 2009, a 300 square-foot rooftop in Manhattan, Kansas was planted with fifteen grasses and forbs (all native to the Flint Hills Eco-region). A four-to-seven-inch lightweight soil was planted with eight rows of drought-tolerant grasses and interspersed with ten species of forbs. Sedums were planted in three-to-four-inch soils along outer portions of the roof. This prairie-based green roof is located in a region where few green roofs currently exist and where several very large green roofs are being designed.

Complementing green roof research by Sutton (2008) and Dvorak and Volder (2010), researchers are monitoring the viability of native grasses/wildflowers, and non-native sedums on this south-facing green roof. The following green roof variables have been closely monitored: rainfall and stormwater runoff, subsoil and surface temperatures, and vegetative survival, growth, and coverage. Using photographs, plant counts, and plant measurements, establishment of vegetation over the first four years has been documented, along with the timing and duration of supplemental irrigation. This presentation focuses on findings specific to the observed precipitation amounts on and stormwater runoff from this integrated (non-tray) native plant green roof.

Rainwater leaving the green roof is captured in a 200-gallon cistern and has been regularly measured. A range of variables (including rainfall and wind speed and direction) are monitored every five minutes using a data logger. Findings for two periods are noted below and additional findings will be discussed in the presentation.

Between 4/15/10 and 6/15/10 (during the green roof’s second full growing season) approximately 1,464 gallons of precipitation was held on the green roof, roughly 60-65 percent of recorded rainfall during this two-month period. During a two-day rain event on September 12-13, 2012 (during the green roof’s fourth full growing season) approximately 231 gallons were retained on the green roof, roughly 53 percent of recorded rainfall during this two-day period.

Research findings are highly relevant for green roofs envisioned for the Great Plains, and have informed green roof design for the National Park Service’s Tallgrass Prairie Preserve and Kansas State University.
Sustainable Public Open Space: Enduring Brownfields Makeovers in Urban Landscapes

Jayoung Koo, University of Kentucky, United States, jayoung.koo@uky.edu

Keywords: sustainable public open space, brownfields conversion, urban restoration

Recovery efforts and sustainable development awareness since the 1990s have increased opportunities to restore disturbed sites in urbanized areas (IEDC, 2001; De Sousa, 2008; Reed, 2006). Sustainable public open spaces are results of transforming deteriorated post-industrial landscapes into re-functioning urban places. The goal of this research is to structure a sustainable public open space framework that can further guide the increase of brownfields conversions into public open spaces. Existing literature on public space and open space do not sufficiently represent new types of urban open spaces such as converted brownfields (Carr et al., 1992; Garvin & Berens, 1997; Thompson, 2002). The author explored nine concepts and principles from sustainable urban development, landscape urbanism, and community planning/design theories to structure a comprehensive framework that further supports the creation of public open space on former brownfield sites (Cranz & Boland, 2004; Francis, 2003; Hester, 2006; Sanoff, 2000; Waldheim, 2006; Wheeler & Beatley, 2008). The framework includes physical, social and temporal dimensions that characterize contemporary public open space planning and design with a long-term perspective.

Case studies for two re-created brownfields sites complement the sustainable public open space framework: Crissy Field in San Francisco, California and World Cup Park in Seoul, South Korea. Both projects are similar in geographical characteristics, length of maturity, and design concepts for ecological restoration and urban recreation. For each transformed urban landscape, the author reviewed the literature and conducted site analyses, post-occupancy evaluations, public surveys and interviews as a multi-faceted approach. The case studies present insights for future sustainable public open spaces from the planning and design processes of brownfields conversions and post-construction performances. The study emphasized the performance of sustainable public open space from the user perspective roughly a decade after the sites were opened.

Brownfields conversions are challenging. However, the potential exists for the sustainable public open space framework to aid decision-makers, planners and designers with specific lessons. The physical makeovers are valuable for enhancing environmental, economic and social perspectives for surrounding communities. Further emphasis on responsive management will allow re-created landscapes to adapt to changing users and returning wildlife in the future. Continuous educational and interactive programs and legible landscape features on-site are additional programming elements that can supplement the planning and design solutions.
The Case for a Scholarship of Business Practice in Landscape Architecture

Sean Michael, Utah State University, United States, sean.michael@usu.edu  
Judd Michael, Pennsylvania State University, United States, jh-michael@psu.edu  
Kurt Culbertson, Design Workshop, United States, KCulbertson@designworkshop.com  
David Evans, Utah State University, United States, david.evans@usu.edu

Keywords: Business, Professional Practice, Scholarship, Entrepreneurship

In the marketplace of design and planning services, no topic is as omnipresent yet as poorly researched as business practices. What factors most influence profitability? Are new typologies of firms emerging? Has gender equality among principals deviated in recent decades? How has the Great Recession altered marketing strategies? Will global expansion of firms’ portfolios result in commensurate increases in satellite offices? Are firms adopting sustainable business practices similar to other organizations, and is there a business case for sustainable practices as with other industries (Salzmann, Ionescu-Somers, & Steger 2005)?

These and countless other questions remain unanswered. While the topic of business has traditionally been addressed pedagogically within the LAAB’s curriculum standards for “professional practice”, a similar attention from researchers has never emerged. Despite burgeoning areas of new inquiry, landscape architecture’s literary record exhibits a profound void in this sector of study (Powers & Walker 2009). Business practices, while clearly consequential, have remained all but untouched by over a century of landscape architecture academics.

In publications frequently accessed by those in practice (e.g., Landscape Architecture Magazine, non-scholarly books), the offerings are only somewhat better. While architectural presses offer a modest assortment of popular works on the subject (e.g., Segal, 2006; Mann, 2003; Granet, 2001), only a handful of similar publications speak to landscape architect (i.e., Rogers, 2010; Sharky, 1994). Moreover, all of the latter are primers on the topic which neither attempt nor are able to reflect emerging trends. In contrast, the landscaping industry, with its strong grounding in owner start-ups, entrepreneurism, and profit generation, boasts numerous business-focused publications.

Despite the relevance of business practice to the industry, academicians have yet to sound a call to action when enumerating important future research (e.g., Gobster, Nassauer & Nadenicek 2010). However, Landscape Journal, in identifying the publication’s future goals, concluded its five strategic outcomes with the imperative to “relate scholarship to the practice of landscape architecture” (CELA, 2008). More recently, members of ASLA’s 2012 CEO Roundtable identified the absence of a body of scholarship in business practice as a critical gap in the field of knowledge, and a realm of study that has potential to assist practitioners.

The realm of business practice represents one of the most significant voids in landscape architecture literature. The subject offers an outstanding opportunity to bring practitioners and scholars into partnership, to strengthen the profession, and to elevate the quality of works that professionals can bring to fruition.
The Livable Campus: Standards of Measurement

Erin Daniels, North Carolina Agricultural and Technical State University, United States, eddaniel@ncat.edu
Anna Reaves, North Carolina Agricultural and Technical State University, United States, areaves@ncat.edu

Keywords: livable, campus, performance standards

The purpose of this study is to test and outline a methodology for understanding how to evaluate livability within a campus community. According to the American Society of Landscape Architects (ASLA), “communities are more livable when they respect ecological and cultural systems, promote economic development, strive for social equity, and provide places for positive social interaction” (ASLA 2001). ASLA further defines qualities of a livable community in a 2001 policy statement using the following categories: physical environment, education, housing, jobs and economic development, health, safety and security, and transportation.

This study will use a variety of credible sources such as The Landscape Architecture Foundation (LAF) Performance Series, the Sustainable Sites Initiative (SITES), and Leadership in Energy and Environmental Design Neighborhood Development (LEED ND) to find existing standards that can be used to measure livability as defined by ASLA. It will then develop a matrix that outlines metric calculations for livability. Concurrently, a survey will be developed that will test whether the campus community is “perceived” to be livable. Perceptions will be compared against calculations to determine whether the selected standards of livability are effective measurements.

The matrix and survey will be tested on North Carolina Agricultural and Technical State University’s (A&T) campus. This location was selected because it is easily accessible and has a need for enhancements in quality, sociable, and comfortable open and built spaces. Findings will help reveal whether or not A&T’s campus is livable. More importantly, findings will show whether the various measurements selected were accurate indicators of livability, and whether perception matched calculation. Findings will provide insightful information that can be used for amendments to livability standards and aid in establishing guidelines for campus and community design.
The Stormwater Treatment Chain: Quantifying the Effects in the Southeastern United States

Timothy Schauwecker, Mississippi State University, United States, tschauwecker@lalc.msstate.edu
Jason Walker, Mississippi State University, United States, jwalker@lalc.msstate.edu
Gordon Lackey, Mississippi State University, United States, gml60@msstate.edu

Keywords: stormwater runoff, green roof, green infrastructure, stormwater treatment chain

With an increasing emphasis on managing stormwater at its source to reduce runoff and improve water quality in urban and suburban settings, this research tests a new trend and technique for stormwater mitigation. Low Impact Development (LID) principles and Best Management Practices (BMPs) provide a theoretical framework for stormwater management innovation (Echols and Pennypacker 2008). Recently, Roehr and Young (2010) employed computer simulations to test various combinations of landscape elements' (green roofs, bioswales, permeable pavement, rain gardens, and vegetated walls) ability to reduce runoff depth, volume, peak-flow rate, and mass loading of contaminants at the site scale. Their simulations revealed that employing combinations of landscape elements in series can improve stormwater management (Roehr and Young 2010).

This research quantifies total runoff for two elements of the stormwater treatment chain (one landscape element feeding the next element in series) in the southeastern United States (Dunnett and Clayden 2007). The study investigated green roofs and flow-through planters. Twelve green roof platforms (4’x4’) were constructed to investigate two soil depths (4” and 6”) and two slopes (2% and 33%), each replicated three times and planted with four species of Sedum. Twelve flow-through planters (2’x4’) capture the runoff from the green roofs, with excess water discharging to a rain garden. The flow-through planter media is composed of sand, topsoil, and worm castings and planted with Malabar spinach (Basella alba). Stormwater runoff from the green roof is monitored using a pressure transducer (Campbell Scientific) to calculate volume, rate, and water temperature; runoff data is collected for each green roof individually. Next, the green roof runoff enters the flow-through planter. Likewise, runoff from the flow-through planter is measured using an additional pressure transducer, identical to the setup used for the green roofs.

Results indicate that there is no significant difference between low-slope roofs with the shallower media depth and the high-slope roofs with a deeper media depth. The combination of green roof and flow-through planter reduces runoff equivalent to a pre-developed condition for small storms in the southeastern United States, but does not mimic a pre-developed condition for larger storms. The impacts of this research are on design professionals who make decisions about stormwater management, presents an innovative approach to mitigate the impacts of stormwater runoff, and verifies a method for measuring low flow rates in green infrastructure experiments.
Urban Prospects Along the Aeolian Coast: Infrastructure and the Three Regional Landscapes of North American Wind Power

Matthew Gordy, Iowa State University, United States, mgordy@iastate.edu

Keywords: Renewable Energy, Regional Planning, Landscape Infrastructure, Mapping

This project was initiated to define the socio-spatial and material mechanisms driving the explosive growth of the utility-scale wind power industry in the United States over the ten-year period from 2001-2011, and to speculate about ways this trend could shape the future configuration of cities and urbanism in the United States and North America.

The U.S. wind energy industry has experienced extraordinary growth in the ten-year period from 2001-2011, increasing generating capacity by a factor of 11.5, from 4,232 megawatts (MW) to 48,611MW and net generation of electric power by a factor of 17.8, from 6.74 million megawatt hours (MW-h) to 119.75 million MW-h. The greatest concentration of utility-scale wind farms can be found in the Great Plains Region, where the wind energy resource potential is likewise concentrated.

We constructed a portrait of the new wind power infrastructure with overlay mapping and geospatial analysis with data acquired from twenty distinct databases including governmental resources like the U.S. Department of Energy and the U.S. Census Bureau, national trade associations like the American Wind Energy Association, wind industry businesses like AWS Truepower, and from open-source mapping projects like OpenStreetMap. The project faced significant obstacles in data sourcing due to federal restrictions (imposed by the Critical Infrastructure Information Act of 2003,) and the high cost of wind energy data.

This paper offers a provisional research framework for new forms of energetic landscape/regions, and proposes three categories of renewable energy landscapes: production and transmission, reliability and exchange, and stimulus and standards. Our mapping analysis enabled us to define the parameters of a “wind belt” region with a high-degree of geographic specificity as a nearly continuous, regional-scale energy resource in the central United States. The Wind Belt embodies some of the least populated territories in the U.S. (13.4 million people, 4.3% of the contiguous U.S. population,) yet there are thirteen major metropolitan areas (populations >850,000) with 34.5 million total inhabitants lingering at its ragged margin, like coastal cities along an “Aeolian Coast.”

The urban prospects of the Aeolian Coast are largely contingent upon a regional resource-planning ethos based on geophysical extents rather than political and demographic boundaries. This project is only a glimpse into the potential for wind power to alter the future configuration of cities and urbanism in the United States and North America. Further exploration into the three categories of renewable energy landscapes may point the way towards numerous alternative scenarios.
Water Use Scenarios: An Assessment of Land Use and Crop Alternatives in a Rural Nevada Watershed

Scott Bassett, University of Nevada, Reno, United States, sbassett@unr.edu
Douglas Boyle, University of Nevada, Reno, United States, douglasb@unr.edu
Christopher Garner, University of Nevada, Reno, United States, cgarner@unr.edu

Keywords: Water Use, Scenarios, Hydrology, Climate

Policies revolving around water use in arid and semi-arid regions are often contentious. In regions of the western U.S. many of the concerns involve the supply of water and debates begin over the demand for water with water rights taking center stage. As a working illustrative example of water controversy we use a rural Nevada watershed, the Walker Basin, which incorporates both concerns of supply and demand now and into the future. In 2007 the federal government became involved in the Walker Basin by allocating over $200 million to research water demand strategies and for land purchases with a goal of determining if more water could be delivered to Walker Lake, a terminal lake which has been slowly loosing volume.

With agriculture being the dominant anthropogenic use of water within the Walker Basin, researchers in Nevada have constructed a water delivery model designed to assess how land purchases and agricultural land retirement would influence farmers and Walker Lake. The model incorporates water rights and known delivery rates. Beyond model development, we have designed a series of future scenarios to assess how changes in agricultural practices and other land uses may influence water demand and delivery. In total, five scenarios were generated to represent a range of potential decisions farmers and other land managers may make to either reduce water consumption and/or increase agricultural productivity. The scenarios alter land use practices which impact stream flow, lake level, crop productivity and land cover. The overall conclusion from the research shows little can be done to increase Walker Lake water levels given current and potential increases in regional temperatures. Although little can be done if nothing is done the likely trend would result in a decrease in lake levels. The goal of this research is to illustrate a modeling process for understanding how the supply and demand for water, when integrated with spatially explicit land use changes, may be utilized to inform decision makers.
What We Design and What We Experience: Comparing the Objective and Perceived Measures of Percentage of Tree Canopy

Bin Jiang, University of Illinois at Urbana-Champaign, United States, jiang25@illinois.edu
Dongying Li, University of Illinois at Urbana-Champaign, United States,
Chung-Heng Hsieh, National Chung Hsing University, Taiwan, wn1172@hotmail.com
Chun-Yen Chang, National Taiwan University, Taiwan, cycmail@ntu.edu.tw
William C. Sullivan, University of Illinois at Urbana-Champaign, United States, wcsulliv@illinois.edu

Keywords: percentage of tree canopy, aerial photograph, eye-level panoramic photograph, objective measures, perception, preference

The easy availability and widespread use of aerial photographs makes it simple for landscape architects and urban designers to gain detailed knowledge of a site without going to the site. Google Earth produces high-quality photos of most places on earth at no cost to the user. This combination of easy access and no cost has made the use of aerial photographs ubiquitous in design and planning circles. Given the details available in these photos, it is likely that some designers feel that they can get to know a setting simply by looking at the aerial photographs on their computer.

But can this be so? Can we eschew traditional forms of procuring information about a site (eye-level photographs, walking around on the site) and rely instead on information conveyed by aerial photographs? How closely does the information gained via these photographs match information gained from on-site photos? In this study, we examined these questions by looking at how closely aerial photographs matched information about the density of tree canopy cover gained from on-site photographs. Our hypothesis was that there would be a weak, positive correlation between these two forms of exploring a site.

We selected high-resolution Google Earth aerial images of 141 streetscapes in five mid-western cities in the United States. We then visited each site and made eye-level panoramic photographs of each street scene. The percentage of tree canopy of all photographs (aerial and eye-level photos) was calculated objectively using the histogram function of Adobe Photoshop CS 5.1. Then, 59 landscape architecture students and 350 recruited participants provided quick assessments of the amount of tree canopy in the eye-level panoramic photographs. They also provided preference ratings of these same images. We then compared the various measures for each of the 141 settings.

The result showed high correlation for the objective measurements made from Google Earth and the eye-level panoramic images ($r = .88$) and the quick assessment of tree canopy for both objective measures ($r$ ranged from .87 to .97) demonstrating a much greater reliability among the various measures than we had imagined. Still, results indicated that assessments of eye-level photographs had a stronger association with perceived percentage of tree canopy and preference than plan view measurements. We will consider the implications of these findings for teaching, practice, and research.
Service Learning & Community Engagement

Changshan Huang, Texas A&M University, United States, changshan.huang@gmail.com
Ture Petersenn, Academy for International Education, Germany, petersenn@aib-studyabroad.org

Keywords: Service-Learning, Experiential Learning, Pedagogy, Action Research, Design Education

Service-learning is an “educational experience that allows students to participate in an organized service activity that meets identified community needs and reflect on the service activity in such a way as to gain further understanding of course content, a broader appreciation of the discipline, and an enhanced sense of civic responsibility.” As a form of experiential education, service-learning is widely promoted in design education in the US because advocates claim that it has a powerful impact on students. Nevertheless, how to maximize the outcomes of service-learning still remains as an important question in the minds of those who conduct service-learning.

At Texas A&M University, service-learning is recognized as a high-impact learning strategy and has been integrated with both MLA and BLA curriculums for the last two decades. The students are provided various opportunities to participate in service-learning activities through design studio projects, graduate final projects, and directed independent study, as well as faculty-lead work studies and internships. In past 16 years the author has conducted more than 40 service-learning projects. More than 200 undergraduate and graduate students in landscape architecture, architecture, land development, and urban planning programs, were involved in those service-learning projects.

In the process of conducting those service-learning projects, a set of teaching strategies have been developed based the theory of experiential learning. These teaching strategies integrate evidence-based design with interactive and interdisciplinary design approaches, emphasizing on the so called 7 P’s: philosophy, process, precedent study, programming, product, presentation, and post-design reflection -- the key components of the core knowledge/skill/ability of a landscape architect. As an action research, these teaching strategies have been applied, tested and modified in a cyclical process for more than 10 years.

This paper will present and discuss the teaching strategies based on the experiential learning theory for service-learning at Texas A&M University and to demonstrate how they are applied in service-learning practice using a recently completed service-learning project. It will also discuss the procedure and criteria used to identify and select appropriate design projects for service learning as well as show the evidence of learning outcomes of service learning projects and actual benefits of service-learning to the students and communities.

The purpose of this paper is to deepen and promote dialogue and understanding of the pedagogy of service-learning and participatory action research in design education, and optimize teaching effectiveness and learning outcomes of service-learning for students.
Assessing the impact of an immersive service-learning program in Tanzania: Lessons from the field

Mallika Bose, Pennsylvania State University, United States, mub13@psu.edu
Brian Orland, Pennsylvania State University, United States, boo1@psu.edu
Larry Gorenflo, Pennsylvania State University, United States, ljg11@psu.edu

Keywords: Student Assessment, Service-Learning, Study Abroad

Background
Small groups of students have visited Udzungwa Mountains National Park (Tanzania) for an immersive 6-week service-learning study abroad program centering on community design to accommodate human needs while conserving nature. The park is one of the most biologically diverse in Africa. Students are mostly from Landscape Architecture but have included others from Architecture, Geography, Business, Community Development, and Communications. Students gain hands-on experience in design and planning for the extraordinary challenges facing developing countries.

Purpose and Significance
This study assesses the impact of the program on student learning as it relates to values, social responsibility, ethics, and self-efficacy. It seeks to discern whether the program is fulfilling its stated objectives, and to facilitate continuous refinement to meet the needs of students and the communities where projects are based. There is a paucity of research on the impact of service-learning courses in the design fields on student learning, and this study aims to fill this gap.

Methods
Student learning was assessed via a pre-post survey design utilizing established valid and reliable instruments (Personal Social Values/PSV scale– 4 items; Ethics Position Questionnaire/EPQ Idealism/Relativism – 20 items; Global Belief in a Just World/GBJW scale – 7 items; and Community Service Self-Efficacy/CSSE scale – 10 items). Two cohorts of students completed pre- and post-surveys and wrote two reflective essays in the course of the programs in 2011 and 2012. Statistical analysis (descriptive frequencies and t-test) is combined with content analysis of essays to make sense of student learning.

Findings
Initial analysis demonstrates that there was no significant change in PSV scale, but this may be attributed to the high initial PSV scale score of students (13.25 out of a maximum possible of 17) leaving little room for improvement. The students showed a significant reduction in their EPQ/Idealism score: possibly an indication of naïve idealism on the part of the students at the beginning, eroded by an understanding of the enormity of the challenges facing planners and designers in developing countries. Students also posted significant increase in their CSSE score, consistent with the program’s goal to show students that their skill sets are adequate for and even well-suited for the tasks they face in the program. There was no significant change in the EPQ/Relativism and GBJW scores. Content analysis of reflection essays will be used to understand these trends and lend a better understanding of the impact of the program on student learning.

Paul Russell, Clemson University, United States, russel5@clemson.edu
Daniel Harding, Clemson University,

Keywords: community design design build

This paper examines service-learning and community engagement as an opportunity for the design studio to develop not only an awareness of community needs and fulfill those needs, but also is an opportunity to engage communities in a critical dialogue regarding environmental stewardship, the interface of the built and natural environments and design as a communicative device. This idea will be explored through the lens of an interdisciplinary landscape architecture and architecture design build studio and the studio’s semester long involvement with the Greenville, South Carolina Humane Society. Through imagery and diagrams reciprocal learning of both the students and community will be illustrated.

The Greenville, SC is a non-profit NO Kill animal Shelter. After moving to a recently updated and refurbished new facility (McMillan, Pazdan, Smith Architects) adjacent the downtown Greenville airport and Swamp Rabbit Trail, the GHS found itself overwhelmed with community members wanting to adopt pets, offering to volunteer, and those just wanting to bond with a puppy for an hour or two. Within a few weeks, the new facility had difficulty fulfilling its demand. The shelter evolved into more than a refuge for animals, but rather, a desirable destination for the community. Having depleted the majority of capital campaign finances on the newly outfitted facility and structure the Humane Society engaged the Clemson University School of Architecture and Department of Landscape Architecture to partner in exploring the potential of the site and surrounding opportunities.

By tracing the steps of the studio through the processes of engaging the Humane Society community, dialogue, needs identification, and conceptual design we will demonstrate effectiveness of the service learning studio as a vehicle to recognize issues and needs within a community and as a forum to discuss, model, and propose strategies that facilitate or fulfill specific needs. Additionally, we will follow the studio as they engage the community through a series of charrettes, model reviews, precedent studies, and design development alternatives which effectively educate and enlighten the community partners towards an efficient, environmentally, responsible, and critically developed resolution to their respective needs.
Capturing Collective Imagination: Towards the Well-being of Mesopotamia’s Oldest Living Settlement

Hooman Koliji, University of Maryland, United States, koliji@umd.edu

Keywords: Public Imagination, Well-Being, Community Participation, Social and Physical Environments

"The thing about Erbil is that it is, in fact, a living town ... It goes back at least to 5000 B.C. ..."
McGuire Gibson, Mesopotamian archaeologist - University of Chicago

Located in upper Mesopotamia (northeast of Iraq), the city of Erbil features over 7000 years of continual inhabitation history, a unique union of cultural and environmental negotiation.

Erbil’s historic citadel is a prominent urban-landscape landmark that literally identifies a center for the concentric city plan, serving as a heart for the community. Cultural values – including those pertaining to the “invisible cultural heritage” - are closely tied to the historic citadel due to its continual inhabitation.

The citadel’s residents were relocated to “new” parts of the city less than a decade ago, ceasing inhabitation at the “heart,” and leaving it as archeological site with daily few visitors. The citadel is abandoned and millennia of societal continuity-which shaped urban fabric and landscape is at jeopardy. Vacant buildings and small courtyard gardens are under deterioration.

Due to recent local economical prosperity, the city is currently under a “rapid” physical growth, too fast to allow negotiations with the socio-cultural norms. Public attentiveness and engagement is needed for the re-use of the historic center and to prevent its deprival under the dust of new developments. A team comprising of the faculty of School of Architecture Planning and Preservation at the University of Maryland (UMD), community locals, and NGOs in Erbil participate in a design research effort to engage the community in the revitalization of the citadel. The goal is to re-transform the citadel of Erbil into a living environment with strong ties to the societal daily activities with the added goal of integration of social and environmental developments.

This paper presents an on going research on the role of “public imagination” as a productive means to augment environment. The author will discuss the design research plan with regards to the social and built environment context, methods of community participation in terms of creating a communicative platform, and potential impact on the well-being of both physical and societal environments of the city.

Societal ties to the historic citadel - cultural assets-are used as apparatus to raise “consciousness” and “will” for change. Planning and design proposals will be an outcome of a collaborative effort between the UMD and the local community. Concluding remarks include introduction and discussion of a studio model for such international projects.
Covenant Farms

Carey Clouse, University of Massachusetts Amherst, United States, careyclouse@gmail.com

Keywords: urban farming, green jobs, vacant lot repurposing

In 1943, Americans planted over 20 million Victory Gardens, and that harvest accounted for nearly one third of all the vegetables consumed in the country that year. Today, fresh food follows a much more circuitous path, resulting in increased preservatives, transportation costs and cultural uniformity. This disconnect particularly penalizes the poor, who are both more likely to live in food deserts and can’t afford to pay the high price of imported perishables.

Covenant Farms is a community-based design build project that brings urban farming to the 6th Ward in New Orleans, while promoting vacant lot repurposing and green jobs for at-risk youth. In New Orleans, a post-Katrina landscape offers up abandoned and underused land for food production. Vacant lots, some thirty thousand already seized by the New Orleans Recovery Authority for redevelopment, are logical opportunities for the extension of greenspace in the city. The resurrection of the Victory Garden concept within this new landscape fits neatly into the New Orleans Recovery model, while simultaneously repairing the disconnect between farm and table.

Covenant Farms is an innovative program that introduces students to urban farming through the work of hands-on gardening and a paired curriculum focused on food justice. Working with a professor and volunteers, students have now cleared, planted, cultivated and harvested a host of crops. Because Covenant House has already acquired a dozen different sites, the team designed a flexible kit-of-parts approach. Each garden contains the same raised beds, compost bin, work surface, and water source, but these units become organized according to site-specific factors. Additionally, some of the supports for these gardens can be optimized and shared, evolving over time. One centrally-located tool shed, for instance, accommodates the needs of multiple sites, and a single chicken coop may prove sufficient for the entire project.

Covenant Farms has five functioning gardens up and running, with plans for more gardens over the next year. Students benefit from green job training, while neighborhood blight gets transformed into productive agricultural and civic space. The program is not without it’s challenges: building infrastructure, training students, and mediating relationships with the community and neighborhood prove to be time-intensive endeavors. However, Covenant Farms makes the connection between farm and table that so many urban farming programs highlight, while transforming the lives of young people and the productive fabric of a shrinking city.
Diagramming the Community Design Process: Making Visible the Complexity of Community Participation in Design

Katherine Melcher, University of Georgia, United States, kmelcher@uga.edu

Keywords: community design, community participation, process diagrams

Community design is often more about process than product. It is in the process where the community gets engaged – perhaps even empowered – by creating relationships and developing strengths that carry beyond the realization of the project. But what exactly is the community design process?

Since community design’s beginnings in the 1960s, community designers have used diagrams to describe how they work on projects with a community. Randolph Hester, Jr. (1990) outlines twelve steps to his community master plan process, starting with listening and setting goals and ending with evaluation. Barbara Faga (2006) created a multi-level diagram with the public process running parallel to the design process and feeding into it at each stage. Umut Toker (2012) describes his process as a “V” with feedback loops that narrow down from preliminary exploration toward implementation.

Each of these process diagrams was based on the individuals’ own personal experience, and each includes community in a different way; leaving me to wonder: What can process diagrams tell us about the different ways community can be involved in the community design process?

To answer this question, I analyzed process diagrams from published sources on community-based design as well as diagrams collected from participants at a recent Association for Community Design conference. Sixteen community design professionals participated; they have been practicing community design for an average of 12 years. The projects they work on varied from small scale self-help housing and public places to larger scale neighborhood planning. The analysis included describing the form of the diagram, the steps outlined, and how they delineated community involvement.

Three main forms of community involvement emerged from the analysis: a line parallel to the design process feeding into it; a hub where all design decisions circle back into it; or an integral process with no distinction between the community and the design team. Each of these forms raises questions about the roles of the community and the roles of designers in a design process.

Additionally, participants at the Association for Community Design conference were asked to highlight the area(s) on the diagram they found most challenging. The responses varied widely – from getting community involved at the beginning of the project to coming to consensus during the design phases to bringing the project into implementation.
Escuela Ecologica Saludable Initiative: Facing the Challenges of Classroom Construction in the Assentimientos Humanos of Lima Peru

Benjamin Spencer, University of Washington, United States, bspen@uw.edu
Susan Bolton, University of Washington, United States, sbolton@uw.edu
Jorge Alarcon, Fundacion San Marcos, Peru, contracoco@gmail.com

Keywords: Urban Slum, Participatory Design, Schools,

In Lima, Peru, where more than a third of city's 9 million occupants live in slums, the conditions of the built environment, ecological degradation, and human health are inextricably linked. By 2050, Lima’s population is expected to increase to 16 million and the city’s primary water supply, the Andean glaciers, will melt as a result of climate change. The hardships that the city’s slum dwellers face will become increasingly acute.

In response to these challenges, an interdisciplinary team of designers and researchers from the University of Washington, the Universidad Nacional Mayor de San Marcos and Architects Without Borders Seattle have launched the Escuela Ecologica Saludable Initiative. Grounded at the Pitágoras School in Lomas de Zapallal, an urban slum of 27,000 in northern Lima, the initiative involves the design and implementation of interventions in community infrastructure and the monitoring and evaluation of their environmental, economic and human health impacts. It integrates activism, interdisciplinary research and education. The presentation will discuss one of the Escuela Ecologica Saludable Initiative’s inaugural projects; the design and construction of a secondary school classroom. Initiated through a series of participatory workshops in the summer of 2010 and designed with ongoing community input, the classroom project was repeatedly delayed as a result of administrative complications, political circumstances, the withdrawal of contractors and rising construction costs. As promised deadlines came and went without tangible results, the support of some community members waned and the relationship between the school and professionals involved in the project grew increasingly tense.

The classroom’s construction is now nearing completion and community tensions have eased. Regardless, the project’s complications offer a compelling example of the kinds of hurdles designers must overcome when working in developing urban contexts. Considered in tandem with the enormous scope of urban slum development both in Lima and worldwide, they highlight the vast gulf that exists between the aspirations of impoverished urban communities and the ability of professionals and municipal governments to act. While on the one hand, the project serves as a note of caution and a benchmark for managing community expectations, it also challenges us to pioneer new approaches to design implementation that respond to immediate community needs.
Four-legged Ecoreveletory Agents of Engagement: The Potential of Targeted Grazing as a Tool for Community Building, Ecological Restoration, and Public Outreach

Zachary Richardson, University of Georgia, United States; zachabides@gmail.com
Eric MacDonald, University of Georgia, United States; eamacdon@uga.edu

Keywords: Targeted grazing, Prescribed grazing, Goats, Sheep, Ecoreveletory landscape management, Community engagement, Invasive Species

This paper describes the results of an ongoing, university-initiated project that utilizes sheep and goats to catalyze community involvement in urban ecological restoration. The paper discusses how several community engagement techniques were folded into a targeted-grazing project in order to learn how landscape architects and planners might utilize the experiences of enchantment that arise from animal-human interactions to increase public interest in urban ecological restoration. The paper discusses how these techniques may be applied to similar efforts in other communities.

Throughout the United States, landscape architects, planners, and other land management professionals are experimenting with the use of goats and sheep as biological agents for controlling invasive plants and assisting in the restoration of ecological function in woodland and riparian environments. For urban conservationists, these animals represent a cost-effective, non-toxic and non-polluting, and effective technology for managing pest plant species. Aside from these benefits, however, the employment of goats and sheep in urban settings represents an opportunity to engage the public in the process of rehabilitating and re-inhabiting neglected urban “wilderness.”

Using a degraded riparian woodland as a test site, the authors initiated a targeted-grazing program in a highly visible section of a major university campus. While the program tested the effectiveness of targeted-grazing as a method of invasive vegetation removal, the effort also was designed to capitalize on the charismatic and gregarious nature of goats to attract admirers, curious passers-by, neighborhood children, and other community members to the site.

During a period of six weeks in Spring 2012, the project engaged over 150 community volunteers who logged more than 420 hours of service. In addition, more than 300 adults and children (and countless university students, faculty, and staff from across campus) attended events focused on targeted-grazing and urban ecological restoration. Observations, surveys, interviews, images, and video were used to document the community’s shift in perception of the site.

The results of the project suggest that landscape architects should consider how animals may become vital partners in managing urban cultural landscapes, and catalysts for galvanizing community, promoting awareness of undervalued urban natural areas, and engaging the public in the process of reclaiming ecologically damaged urban landscapes. The paper includes case-based suggestions for how landscape architects may include prescribed grazing in designed landscapes that interweave plants, animals, and humans in ways that lead to greater knowledge of local nature, attachment to place, and participation in environmental stewardship.
Ideologies and Challenges in Shifting Park Discourses of Million Amenity Park, Busan, South Korea

Sungkyung Lee, University of Georgia, United States, sklee@uga.edu
Seung-hwan Kim, Dong-A University, South Korea
Sungyung Yoon, Dong-A University, South Korea

Keywords: Million Amenity Park, citizen participation, large urban park, park discourse

Million Amenity Park (also known as A-Million-Pyung-Culture Park in Korean) is a one of the most significant citizen participatory projects proposed to a million pyung site (equivalent of 815 acres) in Busan, South Korea. This on-going project is distinguished from other civic participatory projects in the country in terms of its massive project size and citizen leadership that influences the position and involvement of the local governance.

Among various methods used by the civic organization to promote the project and citizen participation, this research draws attention to park discourses disseminated through Korean public media. While the primary purpose of the park discourses is to rationalize constructing the proposed park, they directly reflect urban park ideologies that respond to contemporary social needs and challenges that re-articulate the role of the civic organization in the process. Using discourse analysis method, this research analyzes written verbal justifications of the project and park construction strategies distributed through various public media sources. Analysis focuses on how project goals and justifications have evolved over time and how the changes have shifted the way that the proposed park is idealized within different park discourses. Over the past 10 years, the project has evolved around three major park discourses: 1) an urban park construction project led by civic leadership with a main goal to provide quality park service and public amenity, 2) a seed project expanded to small scale urban park construction projects and community engagement programs that fosters civic leadership, and 3) a hallmark project to initiate and promote National Urban Park Movement. Currently, Million Amenity Park is in the forefront of the civic effort to establish National Urban Park Legislation that will contribute to redefining the role of large urban parks as critical urban infrastructure for nationwide balanced green development. Although the main purpose of these park discourses is instrumental in nature to legitimize the project challenged by various social and economic constraints, this paper argues that what has been discussed and communicated through these discourses is not just shifting verbal tactics. It is important social documentation of civic criticism about the current condition of park resources in the city and the lack of governmental support. Further, it serves as an important medium of social learning in which the significance of large urban park is emphasized both as a source of public amenity and critical green urban infrastructure.
Inching Towards Change: The Long Game of Community-University Partnerships

Jane Futrell Winslow, University of Texas at Austin, United States, jfwinslow@utexas.edu
Barbara Brown Wilson, The University of Texas at Austin, United States, bbwilson@austin.utexas.edu

Keywords: asset-based design, community engagement, design-build, sustainable development

In the design professions, often the needs of the underserved go unnoticed. There is an increasing awareness that “sustainable development” requires a more holistic approach, integrating important social and economic issues with environmental design. Public Interest Design (PID) forges a relationship between public service and design to address real community needs. A PID course at the University of Texas at Austin in 2011 connected advanced students interested in the built environment and public service with leading practitioners in public design. An interdisciplinary approach engaged students from diverse backgrounds including architecture, landscape architecture, planning, geography, political science, policy studies, and economics. The PID program offered students the opportunity to investigate what it means to be a public servant and a designer.

In this paper, the author(s) use a case study approach to retell how one project blossomed from a toolkit and some spray-paint into a municipally driven pilot project. This narrative serves to illustrate the argument that a lasting value of design-oriented community-university partnerships lies in small-scale incremental changes that can be amplified through a focus on long-term collaborations and on policy implications for each intervention.

The PID projects, located in East Austin employed an asset-based design approach. Rather than focusing on communities’ needs and problems, asset-based design focuses on the positive assets and capacities of communities to encourage residents to actively participate in the process. Students learned the value of creating influential and meaningful projects through an ongoing dialogue with and participation of community members, to voice concerns and give constructive feedback. This collaborative process empowers others through design; it shows that they too can create positive change in their own communities. Based on citizen engagement and input, students built four projects in the five-week summer course; community partners involved with each project were satisfied with the work and the end result. The alley project drew on previous relationships with community partners. Staff members from the City of Austin Public Works Department and Office of Sustainability collaborated with the project, offering advice and support throughout the course. Because of the effective collaboration among city staff, neighborhood residents, community organizations, and university students and faculty, the project has evolved into City-funded alley greening demonstration project. The partnering effort continues to grow, incorporating student design concepts to be completed and constructed by the city in 2013. It is anticipated that the project will serve as a model for future alley improvements citywide.
Lessons from Five Service-Learning Projects

Omar Faruque, Cal Poly San Luis Obispo, United States, ofaruque@calpoly.edu

Keywords: service learning, campus planning, open space, housing, winery

This paper examines five service-learning projects that the author undertook for his design studios over the last five years. The focus of this investigation is to identify the patterns in acquiring, researching and designing the projects, and then to evaluate the learning experience of the students.

These projects include a destination resort for a major winery, a housing community, and the central iconic spaces of three major university campuses in USA. The paper explains how the projects were organized, how the stakeholders participated, and how the reviews were conducted at various stages of the design process. It also shares the insight the author gained from the constraints and opportunities in working with real clients.

The paper discusses the level of student motivation, engagement and seriousness in collecting, researching, generating design goals and preparing the programs, exploring design options and converting them into coherent design solutions, and then presenting to the clients. It also includes the assessment of students' satisfaction and confidence as well as the clients' benefit in receiving a wide range of design solutions that they could not get by hiring professional offices.

The conclusion contains comments on the pros and cons of undertaking service-learning projects and what steps should be taken to ensure that the learning objectives of the courses are enhanced rather than compromised. The author also shares his insight as to what kind of courses and design studios are most appropriate given the variety of projects and clients, and how the courses or design studios should be adjusted to get the most out of them with regard to their learning objectives.
Opportunities and Constraints: Challenges and Benefits of Service Learning

Jon Calabria, University of Georgia, United States, jcalabr@uga.edu
Alfie Vick, University of Georgia, United States, ravick@uga.edu
Paul Matthews, University of Georgia, United States
Shannon Wilder, University of Georgia,

Keywords: service-learning, moral reasoning,

Graduate students worked with community partners to analyze and plan enhancements for an existing botanical garden at a land grant institution. This study investigates their experience with the design process and service-learning. Findings in this study are consistent with the pedagogical literature about the service-learning and point to a positive experience that can enhance moral reasoning and responsibility. For this project, students completed a survey at the end of the semester and results pointed to areas of concern and benefits associated with a service learning project. The questionnaire followed both the Service-Learning Benefit (SELEB) scale (Toncar, Reid, Burns, Anderson, & Nguyen, 2006), and the Community-Based Learning—Student Survey (Gelmon, Holland, Driscoll, Spring, & Kerrigan, 2001) instruments to discern interactions with the community and benefits that may have accrued to the students, faculty and community partners. At the beginning of the project, students prepared inventory maps and performed extensive analyses based on programmatic elements discerned through the community partners. During a two day charrette, teams of students worked side by side with partners to envision different master plans based on the priorities of the team members. The design process was strongly influenced by inventory and land suitability analyses. Several challenges and benefits were associated with this service-learning project. Although most students reported they learned much about communicating and engaging community partners and the design process, it was not without discomfort. Students wrestled with the difficulties associated with engaging and satisfying stakeholders. Some students were concerned about cultural and social divides that occurred during the charrette. Overall, students reported that the project had tangible benefits such as learning to work with others and that they developed a better understanding of other people, particularly as a result of understanding their own biases. Students also reported an increase in awareness about their own strengths and were excited about the community benefits associated with the project.
Promoting Civic Engagement Through Community Engaged Design: The Case Of The Mountain View Community Garden

C.L. Bohannon, Virginia Tech, United States, cl@vt.edu
Terry Clements, Virginia Tech, United States, tclement@vt.edu
Patrick Miller, Virginia Tech, United States, pmiller@vt.edu

Keywords: Community Engagement, Pedagogy, Design Education, Transformative Methods

Traditional design education in Landscape Architecture has used design studio as the core of its curriculum. This presentation argues that Community Engaged Design (CED) should be implemented as an integral component of design studio. The inherent relationship between institutions of higher education and the communities they serve is central to professional success, as such; the value of incorporating CED into design education curriculum will be addressed in this presentation. Community Engaged Design provides students with the opportunity to put theory into practice in real-world settings.

Community Engaged Design projects are intentionally linked to academic learning objectives and incorporates specific pedagogical and professional goals. Researchers suggest that community engagement is a valuable tool that can complement and enhance other traditional learning methods. This pedagogy specifically draws upon the work of Ernest Boyer who called for heightened dignity to be brought “to our most pressing social, civic, and ethical problems, to our children, to our schools, to our teachers, to our cities (Boyer, 1996, pp. 19-20). Through working on projects that engage local community partners, students internalize and experience the theories that they have learned in courses. Moreover, the incorporation of the principles of reflection and reciprocity, allow students to begin transitioning to more professional mindset in which they are able to develop practical knowledge that incorporates societal complexities.

This research project illustrates the benefit of a transformative critical pedagogy that undertakes questions of power relations as they relate to social justice, race relations, and socio-economics. In working with the Mountain View community, students participated in CED and begin making the transition from learner to practitioner by working with the community to transform a half-acre vacant lot into a thriving neighborhood hub where residents can participate in urban agriculture. The garden is a focal point of the neighborhood and serves hundreds of residents. The Mountain View Community Garden project embodies the ideas of an “engaged design” and community engagement pedagogy. It will be highlighted as a success story of community engagement in the design education process.

The findings of this project will inform current debates in scholarly planning and design research about collaborative processes by providing general guidance to educators who are interested in contextualizing their curriculum with CED. Furthermore, it suggests that a transformative pedagogy provides an opportunity for educators of landscape architecture to build a bridge from the theoretical projects of design studio to the practical issues of professional praxis.
**Resourcefulness and Community Design: African American Yards in Baton Rouge, Louisiana**

**Richard Alomar**, Rutgers, the State University of New Jersey, United States, richard.alomar@rutgers.edu

**Keywords**: African American Gardens, landscape, Community

The effect of race and culture on gardening and farming practices in African American rural and urban communities has been clearly documented (1),(3),(4),(5),(6),(7) as well as the progressive nature of rural practices and education (2),(4). This study will focus specifically on what Westmacott (8) termed the "resourcefulness" of African American gardens and how the term opens a new line of inquiry into design and community involvement. Resourcefulness, the ability to act effectively or imaginatively, especially in difficult situations, is one form in which values, ideals and beliefs are expressed by of African American gardeners in their yards.

**Purpose:**
The purpose of the study is to examine materials, objects and spaces in African American Yards in Urban Baton Rouge and how they express the resourcefulness of the gardeners and community.

**Background:**
The information published to date reflects an attitude by African American gardeners toward land and practice that can be used as the foundation to understand design by non-professionals.

**Methods:**
The method of inquiry to the general topic of the African American community and its relationship to land is principally historic and cultural. The study of African American yards in terms of people, object, place and construction provides a broader inquiry into the nature of creativity and design. Through observation, mapping and interviews, yards will be evaluated on how placement, location and the narratives between the object and the owner/designer and the site are used to describe resourcefulness.

**Findings:**
It was found that the yards studied expressed some characteristics typical of African American Yards, as described by Westmacott. Additional investigation is required to see how the yards reflect the transition from a rural to suburban and agricultural to working class population. Understanding that the design of non-professionals is an expression of resourcefulness can help in the community design process.

**Importance:**
The relevance of this study is to better understand the design process of non-professionals, specifically African Americans in the south as expressed in their front yards. Their effort to preserve and maintain existing resources and how this practice may apply to other cultural/racial groups is important.
Solar Park on a Landfill - Integrating Service Learning and Community Impact in the Design Process

Wolfram Hoefer, Rutgers, The State University of New Jersey, United States, whoefer@sebs.rutgers.edu

Keywords: case study, park design, economic viability

Balancing the needs of a local community group that requests support for a complex park design project with the demand for high quality teaching in a landscape architecture graduate program can be a challenge. This paper will demonstrate a case study of a university community design center paving the way for a highly valuable student service learning experience and further supporting the transformation of student designs into professional practice and implementation.

“Give us a suggestion for a boardwalk around our pond,” was the initial request made by the Voorhees Environmental and Cultural Education Foundation (VECEF). That first request of improving accessibility for a pond on the 35-acre property of a capped landfill grew into a complex outreach and service learning project for the Rutgers Center for Urban Environmental Sustainability (CUES). Evaluating the site and speaking with main stakeholders suggested that a broader, more holistic approach would be suitable. In particular the township demanded that future maintenance would be paid for from the revenue generated from solar panels in the park. Evaluating the complexity of the design challenges at hand—landfill reuse, environmental preference, green technology, and economic viability—it became clear that graduate students would benefit from this service learning opportunity. The studio process of developing design alternatives preceded a survey gathering community preferences. 285 responses were analyzed and informed the process of developing a comprehensive design by the CUES team, including a detailed phasing concept. That concept enabled the Township engineer to provide a rough cost estimate for each phase that can be used for fundraising. The phasing concept considers the challenge of providing a recreational experience as soon as the first phase is complete and the park opens to the public as well as adding attractions with every new phase.

The outcome of the presentation is a richer understanding of the power of stereotypes concerning public open spaces. Further, we were able to observe a generational shift of the acceptance of green technology along with a surprising concurrence of preference for thematic gardens between generations. Along with the significant value of interdisciplinary collaboration, the case study shows the importance of an organizational framework for community outreach that can support the long term success of a project.
Stretching Sustainability: Interdisciplinary Design/Build at the Limits

Cory Gallo, Mississippi State University, United States, cgallo@lalc.msstate.edu
Hans Herrmann, Mississippi State University, United States, hherrmann@cadd.msstate.edu

Keywords: inter-disciplinary, design/build, sustainable, green roof

Design/build has become ever more popular in design programs throughout the country. Many of the efforts are focusing on sustainable solutions as a means to educate future practitioners in the most advanced landscape practices available. Of course, if done well, these landscapes also serve as lasting models of good design for the community to enjoy and be inspired by.

For the past four years, undergraduate and graduate students and faculty at a southern university have been engaged in the redevelopment of a local heritage museum’s grounds into a showcase for sustainable stormwater technologies. The site is now the only location in the region, which offers a working example of pervious pavement, a green roof, an infiltration basin, a flow-through planter and a rainwater-harvesting cistern in one place. It has become a visible model for sustainable site development in an area, which has been slow to adopt to change.

During the summer and fall semesters of 2012, the Landscape Architecture and Architecture programs created interdisciplinary design/build courses to develop the final phase of the project, a green roof pavilion. What resulted was a structure, which was perhaps well beyond what the museum had originally anticipated, but never the less has become a valued addition to the community. The pavilion reflects the museum’s motto of “celebrating the past and embracing the future” by re-purposing a recently demolished canopy from an old filling station and adopting it into a cutting-edge architectural element with a lush vegetated carpet now on its roof. The process for designing and building the pavilion offers many lessons, not least of which is the scale at which design/build can be achieved during one or more semesters.

Through this presentation and paper, the authors will share lessons learned and observations regarding the development of an extremely complex project designed and built by students with a lot of assistance along the way. Web based, post-construction student surveys will be discussed which shed light on how the two disciplines perceived the process and what they learned from working on a collaborative project with both landscape architecture and architecture students.
Taming Wicked Problems in Community Design through use of Web-Conferencing

Barry Kew, Pennsylvania State University, United States, bwk2@psu.edu

Keywords: experiential learning, web conferencing, urban ecology, shrinking city, LTER, travel cost

Introducing students to tame and wicked problems within design studios fosters experiential learning by situating students in the midst of real-world design problems [1]. This oral presentation focuses on the results found in tackling tame and wicked problems in an upper division studio in partnership with scientists focused on the long-term ecological research of an urban core.

This studio had a common constraint in older urban cores, a shrinking city [2], with the uncommon opportunity of more than a decade of focused ecological research developed through the Baltimore Ecosystems Study (BES) [3]. As part of the National Science Foundation’s Long Term Ecological Research Network, the BES supports a variety of community-based activities. A studio partnership was developed with the primary intention to take advantage of the collection of BES ecological data and strong municipal collaboration to coordinate an exchange for a semester long design experience.

Within the studio, input exchange included first-hand exposure to the inner-city community and was intensely supplemented with the partners including the City of Baltimore’s Office of Sustainability by web conferencing. Regularly scheduled web conferences for design updates were conducted and resulted in constructive dialogue between collaborators. The design challenge identification and resolution was done primarily at a distance through synchronous and non-synchronous Internet technologies with the collaborators. This experience is important for students to better prepare them for professional practice as it continues to evolve in many firms to be a global enterprise.

The greatest studio opportunities also presented some of the greatest constraints for the students. For example, abundant BES data, partner interests, and geographic distance of the study area posed challenges as perceived by the students. The wicked problems [4] posed by service-learning and community engagement are often challenged by distance and an inability to have frequent input exchange with partners, often due to the cost in time and travel. This technology use helped reduce travel cost while student learning benefitted from the increased interaction with actual community partners.

This studio partner collaboration will continue with different inner-city neighborhoods serving as focused prototypical design exploration/demonstration areas. This approach has benefited from the formalized feedback of the studio partners. Service-learning [5] and community engagement that utilizes web conferencing presents an interesting studio model. This presentation will discuss the lessons learned by the studio instructors from using this studio model including its cost effectiveness, technological challenges, and feedback received from the partners.
The Symbiotic Nature of Giving and Receiving: Service-learning and Social Diversity

Claudia Bernasconi, University of Detroit Mercy, United States, claudiarchitecture@gmail.com
Mariarosaria Di Palo, University of Detroit Mercy, United States, mariarosaria.DiPalo@gmail.com

Keywords: service-learning, design education, outcome assessment, diversity

This study investigated key outcomes of community based service-learning in design education and explored the biunivocal relationship between service recipients and facilitators. Though there is a broad agreement on certain outcomes and pedagogical approaches of service learning, there are still numerous unsolved issues such as impact on academic learning (Eyler, et al., 2001), limited community impact, and the difficulty of rigorous and authentic assessment of outcomes (Butin, 2003). As noted by Furco (1996), Sigmon defined service-learning as an experiential education approach based on "reciprocal learning" (Sigmon, 1979). Therefore service-learning really occurs only if “both the providers and recipients of service benefit from the activities” (Furco, 1996).

The research project involved the development, enactment, and assessment of a new service-learning opportunity for graduate architecture and community development students. Students enrolled in the service-learning course were exposed to design pedagogical theories, and to service-learning approaches and case studies. Students designed a semester long curriculum for a class of seventh grade students at a Detroit middle school, developing project-based learning activities on specific architectural and urban design principles, and implemented the curriculum teaching weekly at the middle school.

The objectives of this research study were to: 1) understand key findings from current literature and define targeted outcomes for the served population (middle school students) and the group administering the teaching (graduate students); 2) develop ad hoc assessment tools to test the effectiveness of the service-learning; 3) measure key perceived outcomes for both the population served and the facilitators; and 4) define recommendations and future directions for service-learning in design education. Qualitative analysis was conducted on: pre and post surveys administered to middle school students and graduate students, in situ feedback forms following each activity, and graduate students’ in class reflections before and after the service, and interim and final essays. The study provided indications on key perceived outcomes of the service-learning, including, among others, increased self-knowledge and personal growth through the questioning of one’s own values and preconceptions in the engagement with a diverse community, increased capability to respect diversity, and increased sense of civic engagement. This study provided a student perspective on the “symbiotic nature of giving and receiving” (student, interim paper), confirming the importance of exposing students to real world contexts and social diversity, and the centrality of service-learning in the shaping designers capable of envisioning design solutions that reflect comprehensive perspectives on the surrounding social environments.
Using Service Learning Design Studios to Create Community Connections and Increase Their Value to Stakeholders, Clients and Professional Designers

William Green, University of Rhode Island, United States, wagre@uri.edu
Catherine Weaver, Tupelo Gardenworks, United States, catherine@tupelogardenworks.com

Keywords: service learning, faculty roles, community interactions, outcomes

Academic programs in Landscape architecture have a long history of providing service to communities and non-profit organizations through service-learning design studios. It is widely recognized that students apply what they learn in the classroom, provide a service to a stakeholder community, and that they reflect on their efforts and interactions. The value to students, through skill building, experience working on real projects, and perception, and to communities through its participation in an interactive process, receipt of services and heightened community awareness is well documented. What is less well understood is what happens to the products and enthusiasm following the end of the semester. This is the time when people inquire about how projects move ahead and who might be responsible for assessing potential projects and engaging in further design.

This paper is about the life of projects after the semester ends and the effects that such projects can have on students, faculty, communities, and design professionals. It is about the role faculty can play in prolonging and promoting projects, and about efforts to assist client communities by building awareness, suggesting paths and providing choices for moving ahead. It is also about the value of strengthened connections between the academy, the stakeholder community and the profession.

The authors will highlight a process used at one institution for more than twenty years and acknowledge the key ingredients of time and timing, personal effort and communication necessary for moving projects beyond the academic environment. It is a transferable process that can lead to project statements and funding, job descriptions for undergraduate and graduate students, and to projects and collaborations with consulting firms and public agencies.

Using two case studies conducted for a local high school and college campus, the participatory process of sequenced tasks will be presented. Emphasis will be placed on the time following the final public presentations, and the methods and events leading to RFP’s, design projects for professional landscape architects and continuing involvement by faculty and recent graduates from the landscape architecture program. Of particular note are opportunities for receiving feedback from students and methods used for engaging practitioners in a dynamic process. The paper will conclude with an assessment of the value of academic efforts as viewed within the context of greater professional and community connectivity.
Sustainability
Case Study: Sustainable Greenway to EcoDistrict

Claudia Goetz Phillips, Philadelphia University, United States, philippc@philau.edu
Kim Douglas, Philadelphia University, United States, douglask@philau.edu

Keywords: sustainable design; eco-district; community involvement

In September 2010, the American Cities Foundation (ACF) launched a unique partnership with Philadelphia University’s Landscape Architecture Program and West Philadelphia Financial Services Institution (WPFSI) to lead a broad and diverse collection of residents and stakeholders in a process to complete a holistic Master Plan for connecting residents to the natural and cultural amenities of Fairmount and Cobbs Creek Parks. The partnership melded ACF’s program development and community engagement expertise with Philadelphia University’s experience and expertise in sustainable design, and WPFSI’s expertise in community planning and development.

The Primary Goal for this Park West Project is to develop a conceptual master plan for the creation of a “Greenway” trail connecting Cathedral Park, Carroll Park and Parkside neighborhoods with Fairmount Park. The planning and design process were to identify opportunities for incorporating green trails, incorporating green infrastructure elements into existing regional planning and development activities, and increase access to Fairmount Park, Cobbs Creek Park, and recreation space for residents in the largely low-income and underserved target communities.

Over two summers and three landscape architecture design studios, landscape architecture and MS in Sustainable Design students and faculty completed the grant tasks. Each initial stage of the project evolved into something more complex and expansive. As a result, the overall intent expanded from creating a “sustainable” greenway trail system to the exploration and designation the commercially developed area of the larger study site as an EcoDistrict. “An EcoDistrict is a neighborhood or district with a broad commitment to accelerate neighborhood-scale sustainability. EcoDistricts commit to achieving ambitious sustainability performance goals, guiding district investments and community action, and tracking the results over time” (Portland Sustainability Institute website). Additional grants are now been pursued to complete a feasibility plan for the greenway trail and for implementing phase I of the EcoDistrict endeavor.

This presentation will discuss the partnership and each’s role in the transformation to the larger concept of an “EcoDistrict.”
Cross Creek Ranch Master Planned Community: Landscape Performance and Lessons Learned

Ming-Han Li, Texas A&M University, United States, minghan@tamu.edu
Bruce Dvorak, Texas A&M University, United States, bdvorak@arch.tamu.edu
Yi Luo, Texas A&M University, United States, yi.luo@neo.tamu.edu
Matt Baumgarten, SWA Group, United States, mbaumgarten@SWAGroup.com

Keywords: sustainability, stormwater, landscape maintenance

The purpose of this study is to present the results of landscape performance investigations and lessons learned from the designer’s perspectives on a 3,200-acre master planned residential community named Cross Creek Ranch. Located in a suburb west of Houston, Cross Creek Ranch has an innovative design that promotes the use of naturalized landscapes as continuous landscape infrastructure elements. Throughout the community, native grasses, reforestation and wetlands are employed as essential components of wastewater and stormwater management systems, interconnected wildlife corridors, and biologically diverse passive recreation systems. The research team was formed to investigate these components and quantify their landscape performance benefits during the summer of 2012. Because of time and budget constraints, the research team first identified environmental, economic and social metrics that could provide meaningful performance information by a snapshot approach. Metrics used include water quality of the wastewater and stormwater management systems, soil fertility, and herbaceous plant diversity. In addition, the research team quantified potential and actual benefits, including sequestration of carbon dioxide, and cost savings through the use of reduced mowing, fertilizer use, and reduction of irrigation with potable water. The analyses of water samples from the constructed wetland reveal that the nutrient and heavy metal concentration was decreased with increasing distance from the inlet of the constructed wetland receiving treated sewage water to the downstream end of the water system. The correlation analysis of soil fertility and herbaceous plant diversity did not show a significant relationship between them. More time may be needed for the natural succession to evolve to exhibit a strong correlation between the soil fertility and plant diversity. Despite the positive landscape performances and cost savings from sustainable practices, the success of Cross Creek Ranch is not guaranteed without continuous improvements and adjustments in various aspects through lessons learned during the long-term development phases. The research team documented the designer’s lessons learned related to practical management and maintenance issues during and post construction phases. The learned lessons can help designers, practicing educators and students revisit management and maintenance strategies when designing similar large-scale landscapes that are immediately adjacent to human dwellings, and hopefully the design, management and maintenance can be strongly integrated in the early phase of a project.
Drawing Sustainable Farming Practices

Sallie Hambright-Belue, Clemson University, United States, shambri@clemson.edu

Keywords: sustainable, farming, drawing, vertical farm, urban farm

I am an architect and a farmer; therefore, as I walk around my small family farm I cannot help but see patterns, systems, and design at work on a daily basis. I also feel very strongly about the principles of sustainable farming and believe this is the way we should grow our food and to this end live in our world. The results are more productivity from our land, humane treatment of workers and animals, enhanced biodiversity, and I am convinced that sustainably grown food simply tastes better.

With my shared interest in architecture and farming, I am drawn to the vertical and urban farming projects that seem to pervade architecture today, but very few of them ever reference sustainable farming techniques and even fewer address farming in any in-depth manner. The projects simply do not work from a farming perspective. This proposal and research is founded on observing sustainable farms, producing documents that explain sustainable farming practices in architectural language, and analyzing the systems sustainable farms use. The importance of this study is to strengthen future vertical/urban farming projects so they can be realized. If we are going to be serious about the possibilities of vertical/urban farming, we first need to better understand farms.

The study has four steps. The first is identification of case study farms. These farms will be diverse operations growing food according to sustainable practices that distribute food to their local region. It is important for those farms to be profitable to ensure that the practices are not only environmentally sustainable but also financially sustainable. The second step is observation. The study will take place over a one year cycle in order to understand the operations through all seasons. The third step is documentation. The documentation will be drawings that map the operations in plan and targeted sections that will make visible relationships that are inherently sectional. The final step is analysis. The study will analyze spatial relationships between systems and uncover overlaps in systems that are not readily seen. It will make visible farming practices that are never seen graphically.

Those who attend this presentation will come away understanding the systems involved in sustainable farming, how the systems are interconnected, and how these interconnections can be integrated and understood in architectural form. This knowledge will allow attendees to further their own work or students’ work on vertical/urban farm projects.
Eating Time and Place: A Systems Framework

Matthew Potteiger, State University of New York, United States, mpotteig@syr.edu

Keywords: food systems, design strategies, sustainability

Eating is one moment in the synchronous web of places and processes that provide the fundamental need for sustenance. The food we eat becomes not only to our bodies but also to the land and labor that produce it, the warehouses, trucks and highways that move it, factories, processing plants, grocery stores, bodegas and farmers markets that sell it, the restaurants, food pantries and kitchens, tables, and other places where it is eaten. Along the way food is less a thing than a set of constantly changing ecological, social, and spatial relationships that constitute landscapes.

This paper presents a four-part framework for articulating the link between food and landscape through: 1). food systems — the actions of processing, distributing, processing, marketing, consuming, and post-consumption that transform food, 2). narratives which track the trajectories of food through the sectors of the food system and reveal the temporal dimensions of food and place, 3). networks — the different configurations of multiple spaces and sites in the system, and 4). place-based strategies for integrating food systems and landscape design such as regional foodsheds and food hubs. This framework is illustrated by case studies of contemporary food system practice and the work from five years of teaching an advanced graduate and undergraduate “food studio.” [Using examples from practice and teaching to both represent and shape food and landscape]

This framework offers a broader conception of the design engagement in food and landscape beyond the spatial strategies of localism and the emphasis in much of current practice on production spaces of urban and sustainable agriculture. Food systems, narratives, networks and spaces open multiple sites and strategies for shaping food and landscapes beyond site-based projects. It argues that the emphasis on local food strategies and the direct substitution of productive spaces into existing landscape typologies needs to be expanded to include the logistical spaces of aggregation and distribution in order make significant structural change in both landscape and food systems.
Economic Analysis of Residential Rainwater Harvesting Systems in the City of Austin, Texas

Hyun Woo Kim, Texas A&M University, United States, kim7230@tamu.edu
Ming-Han Li, Texas A&M University, United States, minghan@tamu.edu
Hye Kyung Lee, Texas A&M University, United States, hyekyung.lee@tamu.edu

Keywords: cost-benefit analysis, RWHS incentive, water resources management, water cycling, low-impact development

Urban water management systems in growing regions face constant challenges in providing a sufficient supply of water, minimizing impacts on receiving water quality, and preventing high-risk flooding resulting from urbanization and climate change. The issue of limited supplies of water resources in urban areas is becoming more critical. A solution that could ameliorate these negative impacts is to have a decentralized rainwater management system in urban areas. In recent years, there have been various sustainable development programs, such as Leadership in Energy and Environmental Design (LEED) and Low Impact Development (LID) that encourage RWHS and are becoming increasingly important. Thus, city governments and agencies are recommending rainwater harvesting as a significant element for new developments (Hicks 2008; US Green Building Council 2006).

Previous studies have examined the potential of rainwater harvesting systems (RWHS). However, financial assessments on RWHS have not been fully studied. Employing cost-benefit analysis of a typical RWHS in Austin, Texas, this study will fill this knowledge gap. Financial analysis in the study determines the amount of incentives that the city utility may provide for the individual homeowners.

There are four research questions for this study: (1) how much water usage can be covered by rainwater for an average residential household? (2) what is the average payback period of the RWHS for an individual household? (3) What benefits does the city acquire from a RWHS installed in single-family housing? and (4) If a projected 7,000 single-family units are motivated to install a RWHS, how much peak-day demand may be reduced, and how much financial support can the utility afford to provide to individual households based on the benefits the utility gains from reducing peak-day demand?

Findings show that the average payback period of a RWHS for an individual homeowner is significantly long in each scenario. However, if a significant number of households are motivated to install the RWHS, the city can reduce the overall future peak day demand and delay the expansion of an existing water treatment plant for approximately 6 years. With the city subsidy, the average payback period of RWHS for an individual homeowner decreases by 4 to 5 years. By redistributing the cost equitably among the parties based on potential benefits received, residential RWHS can be more affordable and practical as an alternative water supply for urban areas.
Energy landscapes: Past and present

Tessa Beach, University of California, Berkeley, United States, t.bernhardt@berkeley.edu
John Radke, University of California, Berkeley, United States, ratt@berkeley.edu

Keywords: Renewable Energy, Photovoltaics

Background: The production, transmission, and consumption of electricity have been primary drivers of land use and landscape transformation since invention of the incandescent light bulb in the late 19th century. The legacy electrical system that exists today is highly centralized, with the majority of power generated at a limited number of supply points, then transmitted to numerous points of demand over a vast network infrastructure collectively referred to as “the grid.” This centralized power paradigm has impacted landscapes directly through the placement of extensive infrastructure and influence on subsequent and neighboring land uses, as well as indirectly through the emission of greenhouse gasses contributing to climate change (Dale et al. 2011). Current trends in renewable energy technology foreshadow a potential shift from this centralized supply structure towards a decentralized energy supply system (Nadai and Van der Host, 2010). By situating numerous small-scale renewable energy generating units at or near points of consumption, such a transition will alter landscape patterns of energy production, transmission, and environmental impact.

Purpose: The purpose of this study describes the evolution, spatial pattern, and landscape impacts of the existing U.S. electrical system, and discusses the implications of transitioning to a decentralized, renewable-based energy supply system.

Importance: Electricity generation and transmission will continue to affect the spatial organization, function, and appearance of natural and built landscapes. As distributed renewable energy generation becomes increasingly viable, it will shape new energy landscapes – new patterns of energy generation, transmission, and impacts. Landscape architects and environmental planners will play a critical role in the planning, siting, and designing of such renewable energy infrastructure systems. This role requires an understanding of the evolution, spatial patterns, and impacts of the legacy electrical system, as well as the potential for new landscape patterns of renewable electricity generation and transmission.

Methods: This study is based on a review of the literature on the development and landscape impacts of the existing electrical network, and its impending transformation from the assimilation of renewable energy technologies. Case studies of integrating solar photovoltaics into California’s landscape at different scales are examined.

Findings: This burgeoning transition to new, renewable sources of energy will undoubtedly drive landscape transformation and patterns of environmental impacts in the 21st century. The findings of this study are extremely relevant to the landscape architect and environmental planning professions as they are well equipped to play a key role in this revolution of sustainable energy systems.
**Multifunctional Landscapes, Sustainability and Measures of Performance in the Urban Context**

**Baldev Lamba**, Temple University, United States, blamba@temple.edu  
**Skip Graffam**, OLIN, United States, sgraffam@theolinstudio.com

**Keywords:** Multifunctional; Sustainability; Landscape Performance

Using an urban design project as a case study, this paper will compare the theoretical framework and practical applications of SITES model of metrics and measures of landscape performance and sustainability with the evolving theory and concepts of multifunctional landscapes. The goal is to test the applicability of SITES metrics to an urban design project, identify where this system falls short, and if the emerging ideas of multifunctional landscapes can be incorporated in order to create a more robust system of metrics applicable to urban design projects.

Over the last 15 years, the evolving theory and concepts of multifunctional landscapes has emerged as an area of research and advocacy across landscape sciences and planning disciplines. It constitutes an important land use strategy for advancing the goals of sustainable development and suggests that multiple environmental, social and economic functions are provided by the landscape (Wiggering et al. 2003). The forces driving ideas of multifunctional landscapes, with many overlaps with the concepts of sustainability and biodiversity, offer another lens to view the design and performance of our cultural landscapes. Originating in the post-war period in Europe, primarily Denmark and England, in the agricultural/crop-science arena in response to growing land pressure and environmental problems, the concepts of multifunctional landscapes has been expanded to regional urban and rural land use strategies. However, the debate among the science and planning disciplines thus far has not been expanded to address the critical contemporary demands of performance metrics and measures of the value added and the efficiency gains from multifunctional landscapes. However, we believe that the underlying ideas of multifunctional landscapes offer promising adaptations for measuring the sustainability of site scale landscape architecture projects.

Starting with an overview of the concepts of multifunctional landscapes, we will use Canal Park, an urban design pilot project for the Sustainable Sites Initiative (SITES) as a case study, adding a landscape architectural perspective to the debate on multifunctional landscapes and identifying areas for further research needed to advance the goals and application of these concepts.
Natural Plant Communities as Green Roof Templates: An Interdepartmental Pilot Study

Tim Toland, State University of New York, United States, trtoland@esf.edu

Keywords: green roof, native plants, sustainability

The implementation of sustainable design typically involves the interplay of ecological, technical, social, cultural and economic considerations, which generally are not the province of any one discipline. As such these projects mandate the use of interdisciplinary teams of consultants, each collaboratively bringing their talents to the table to solve complex problems (Alexiou, et. al., 2010; Walker and Seymour, 2008). Taking a cue from this, the Departments of Landscape Architecture (LA) and Environmental and Forest Biology (EFB) at SUNY-ESF adopted the same mindset to form an interdisciplinary partnership to expand the use of native plants in green roof design.

This paper discusses the collaborative partnership and research project between the author (LA) and Donald Leopold (EFB), as well as staff and students from these departments. The project focused on the use of 44 plant species from native dune and alvar (limestone pavement barren) plant communities indigenous to New York State, whose natural growing conditions closely match those of green roof conditions. Many of these plants are rare and endangered and have never been utilized before in a green roof application, but also present an opportunity to match species to growing condition and to increase biological diversity above that typically found in sedum-based green roofs.

To alleviate consultant concerns over the use of these species for a new building project on campus, the researchers completed a pilot study of the species in test plots replicating the proposed green roof profile. Installation, establishment and maintenance procedures matched those of the project specifications, and the results of the pilot study were used to refine the consultant-designed plan. Of the 44 species, 41 met survival and aesthetic and growth performance criteria, and the green roof will be installed in fall 2012. Additionally local nurseries and designers have expressed interest in the results, and the long term success of the plants may lead to greater market availability and use in the landscape. The results of this collaborative process serve as a model to the other departments on campus, have led to additional joint research projects, and will potentially serve the mutual interest in developing a more sustainable world.
Promoting Sustainability by Designing for the Full Lifecycle Cost of a Project

Melinda Appold, Cornell University, United States, mma96@cornell.edu
Kathryn Gleason, Cornell University, United States, Klg16@cornell.edu

Keywords: lifecycle cost, sustainable landscapes, designing, maintenance

Designers can best promote sustainability by designing for the full lifecycle cost of a project. This paper advocates that we move beyond thinking of the ongoing life of our projects as “maintenance” to factoring in the ongoing dynamic processes of our designs once built. It examines the components of lifecycle costs and how we can design for reduced, sustained upkeep of landscape architecture projects, focusing on public lands. In doing so, we can make these landscapes more sustainable and create less of a drain on civic resources.

Incorporating sustainable practices has become the norm for good design. Designing with pervious pavers, recycling bins and rain gardens are good green practices, but alone they do not make a project truly sustainable. How sustainable is a design if it requires an abundance of unforeseen energy and resources in the years following installation? Nobody really wants to talk about maintenance because it isn’t sexy. Furthermore, landscape architects are taught to design to meet the initial budget of a project, not the ongoing costs. This discussion proposes to change the target and suggests we as designers, design to meet the project’s lifecycle cost instead. Lifecycle costs should be established as part of the conceptual design phase and recognized as the true budget of a project. The increase of cost may be up front for the owner but it has great importance over the long-term life of the project. Municipalities, in particular, would benefit greatly by making public spaces less resource hungry over the long-term life of a space. This paper will model a methodology that landscape architects might use to measure the sustainability of a site over a period of twenty years. It will also consider how do we reflect that in our designs lifecycle cost. Using Millennium Park in Chicago as a case study we examine these elements in detail and make recommendations on design and maintenance practices with an eye towards financial long-term viability.
Reactivation of Public Space with Clean Energy for An Ecotourism Development in Alacati, Turkey

Kaan Ozgun, Queensland University of Technology, Australia, k.ozgun@qut.edu.au
Laurie Buys, Queensland University of Technology, Australia, l.buys@qut.edu.au
Ian Weir, Queensland University of Technology, Australia, i.weir@qut.edu.au

Keywords: public space, clean energy, local agriculture, ecotourism, sustainability in Turkey

An Aegean town on the far west coast of Turkey, Alacati has a rustic urban ecology comprising an estuary, marshlands and historic architecture. Alacati has witnessed diverse cultural and population changes, though century-old wind mills, authentic/original stone houses and cobbled narrow streets remain. These well-established attractions, along with local food varieties and excellent windsurfing, make Alacati a dynamic ecotourism opportunity.

The pressure of urban transformation in Alacati is the focus of this paper, where the Port Alacati Project attracted national and supra-national investors. Land initially protected by regional environmental law was opened to tourism development, and resulted in the Alaçatı Tourism and Investment Corporation and local government commissioning an international firm to develop a master plan for a luxurious canal development. The project disregards existing ecological qualities and excavates terrain to expand the estuary to accommodate luxury housing. While stage one has been implemented, further development ceased over environmental and social concerns. An urgent longterm solution is required.

This paper presents a sustainable landscape architectural design solution using site specificity and addressing the key issues of ecology, employment, public space and community cohesion. Public space, in particular, plays a central role in mediating between clean energy and people, recreation and local agriculture, tourism and education. Local geographical, economic and social information combined with a practitioners approach is used to demonstrate a sustainable design prospectus starting with a new ecotourism master plan. This prospectus simply covers the proposed program, physical-spatial intervention, and its policy suggestion. The programs include local agricultural-sustainable energy generation coexistence, state of art water management, functional social and economic sustainability between locals, NGO, and council. Integrated clean energy generation in public spaces is crucial in creating positive social, economic and environmental change. Overall, the power of public space in educating, engaging and changing local inhabitants and tourists, along with clean energy is promoted with other ecotourism activities.

This paper reflects both the sustainability and urban design track of the conference. Attendees will experience social, environmental, economic, cultural and governmental parameters of sustainability in Turkey through an ecotourism development designed as an alternative to the problematic project. Attendees will explore how a public space design can use clean energy and local agriculture to transform and reunite the locals, tourists and local government. Assessment of learning outcomes will be demonstrated in questions and answers, discussions, projects, plans and analyses.
Relationships among Flow Experience, Qi Experience, Attention Restoration and Preference

Shih-Han Hung, National Taiwan University, Taiwan, shelly6327@hotmail.com
Chun-Yen Chang, National Taiwan University, Taiwan, cycmail@ntu.edu.tw

Keywords: flow experience, Qi experience, Qigong, attention restoration, preference

In 1975, psychological management scholar Mihaly Csikszentmihalyi during his study on creativity found in hundreds of interviews with climbers, writers, dancers, chess players, basketball players, and surgeons, that when their activities went successfully, their feelings and mood followed. This state of optimal experience was termed as “flow experience.” Csikszentmikalyi (1990) wrote that “[f]low is defined as a psychological state: as one concentrates on the task, one will feel joy, happiness, and even enhance the quality of life”. In early studies discussions about flow usually focused on balancing challenges and skills.

However, in recent years, studies conducted in the natural environment had shown that it was not only immersion in activity that produced feelings of flow, but natural environment could stimulate the feelings. (Laski, 1961; Williams & Harvey, 2001). Furthermore, there was a significant body of research which showed that natural environment could restore our direct attention, which in turn was connected to preference (Herzog, Black, Fountaine & Knoits, 1997; Herzog & Kutzli, 2002; Staats, Kieviet & Hartig, 2003).

On the other sides, in Chinese, qigong played a special status role for participants to get the deep feeling (which called qi experience). Hence, in this study, the main purpose was to find that participants practice qigong in different environments, would the surroundings affect the relation among flow experience, qi experience, restoration, and preference, and also find the correlation among these experiences.

In this study, we used 5- likert scale and 2 open ended questions collecting 114 questionnaire forms about flow experience, restoration, and preference from students engaged in qigong activities, and compared three different environments in National Taiwan University (E.g. nature environment, building plus nature environment and building environment). The results showed that there was a significant correlation between flow experience and restoration(r=.36), and also high in restoration and preferences(r=.76). Moreover, comparing to flow, the restoration were more influence in different environments. Then, we compared and discussed three types of environments to see different relationships among flow experience, qi experience, restoration and preference.
Reviews of Theoretical Foundations of LEED-ND: Scale Issues in Sustainable Neighborhood Development

Tsung-Pei Cheng, Texas A&M University, United States, eric429@tamu.edu
Ming-Han Li, Texas A&M University, United States, minghan@tamu.edu
Forster Ndubisi, Texas A&M University, United States, fndubisi@arch.tamu.edu

Keywords: New Urbanism; Smart Growth; Green Building; Neighborhood Units; Neighborhood-Based Action; Regional Context

LEED-ND was developed by the U.S. Green Building Council (USGBC), the Congress for the New Urbanism (CNU), and the Natural Resources Defense Council (NRDC) in 2007. As a voluntary national standard, LEED-ND aims to evaluate neighborhood development projects for site sustainability, which focuses on smart location and linkage, suitable neighborhood pattern and design, and green infrastructure and buildings (USGBC, 2009). The principles of smart growth, new urbanism, and green building are integrated into the standard of LEED-ND. By reviewing the three foundational sources, including the Ten Principles of Smart Growth, the Charter of New Urbanism, and LEED Green Building Rating Systems, this study asks two questions: How is LEED-ND supported by its fundamental design and planning principles? Additionally, how does scale matter in the applicability of LEED-ND?

The principles of these three foundations represent different scale concerns about sustainable development. First, the smart growth movement started as state-level approaches to regulating land use, especially concerning sprawling suburb development. Secondly, in the Charter of the New Urbanism, planning principles were varied for different scales, including regional, neighborhood, and block scales. Thirdly, LEED Green Building Rating Systems originally provided the measureable standard for a building scale. LEED-ND creatively combined theoretical concepts and practical strategies from these three foundational roots to achieve sustainable neighborhood development, when some researchers doubted if, individually, these planning movements could attain sustainability. LEED-ND also inspired researchers to rethink what scale of neighborhood units should be adapted in the context of sustainable urbanism in terms of smart growth, new urbanism, and green building (Farr, 2008).

Any definition of sustainable neighborhood development should be understood within a whole spatial hierarchy. A site of neighborhood scale is always interactively influenced by other spatial levels, from local to regional. Therefore, one of the challenges in delivering sustainable neighborhood development is to ensure the connectivity of different levels across the whole spatial hierarchy. These three foundations encourage a broader perspective of neighborhood-based action engaged within a regional context. To improve the applicability of LEED-ND, it is essential to clarify what the proper scale of a neighborhood unit should be, what its key features are, and how scale matters ecologically, socially, and economically in neighborhood development.

The outcome of this research is two-fold: (1) Clarify the relationship between the standard of LEED-ND and its foundations; (2) Form an understanding about the proper scale of a neighborhood unit to implement neighborhood projects guided by LEED-ND.
Shan-Shui City – Exploring Sustainable City Development in China

Jie Hu, Beijing Tsinghua Urban Planning & Design Institute, China, tsinghuala@gmail.com

Keywords: Shan-Shui city, sustainability, urbanization, culture

City is the symbol of human civilization, the impetus of modern development. Urbanization is not just a modern phenomenon, but was evolved into a world-wide upsurge in modern times. Along with rapid urbanization in China, crises like water crisis, environmental pollutions, heat island and traffic congestion had been the serious threats to sustainable urbanization. Meanwhile, lacks of regional characteristics bring the ‘monotone’ into urban development. In order to solve the problems in China’s urbanization, we proposed Shan-Shui City idea, which breaks the previous confined concept of city construction into pieces, which expected to reform the nature to serve human needs. Instead, the new idea considers human beings and nature as equals, respecting and understanding nature, while attempting to realize human demands for social development, based on protecting the nature and environment so as to achieve a co-prosperity.

The source of Chinese culture had close relationship with mountains and rivers. Considering the source of Chinese Shan-Shui culture, after reverence toward Shan-Shui turned into worship, this worship transforms into an inclination to compare human virtues to mountains and rivers. The paper discussed the relationships between the poetry, painting, traditional garden designing, geomancy and Chinese Shan-Shui culture, which can be concluded to the appreciation of nature in Chinese culture. Several examples of ancient city and traditional gardens are illustrated explain the idea.

We also raised the concept and denotation of Shan-Shui City, proposed a harmonious trinity pattern – “mountain, water system and city” – based on the understanding of the interactive relationship among these three elements. The Shan-Shui city integrating artificial with natural, is the ecological renaissance and artistic conception of the city.

We have applied the Shan-Shui City idea in projects of different scales, six case studies which the Shan-Shui city idea were applied are interpreted. Obtained experiences draw to the principles of planning and designing of Shan-Shui city.

The concept of “Shan-Shui City” implies a complementary relationship between urban planning and Chinese traditional garden art. An ideal livable city should be developed by embracing the natural environment, creating a sustainable, livable and dynamic city, rather than conflicting with nature. Shan-Shui city is the ecological city with typical Chinese features and is sure to head for future.
Successes and Failures of the First Slow City in Turkey: The Case of Seferihisar

Cigdem Coskun Hepcan, Ege University, Turkey, cigdemcn@hotmail.com
Nihal Eser, Ege University, Turkey, nihal_ege86@hotmail.com
Serif Hepcan, Ege University, Turkey, serifhepcan@yahoo.com

Keywords: Cittaslow movement, sustainable life style, case study, Seferihisar, Turkey

The movement of Cittaslow is an alternative approach to urban development and is based on local resources and strengths in terms of natural, economic, cultural and historical aspects (Mayer and Knox, 2006). The movement mainly includes a set of goals and principles such as improving the quality of life, promoting cultural diversity of individual cities and protecting the natural environment (CIN, 2012). The movement gives high priority to sustainability. Cittaslow is mainly a European phenomenon with a number of member towns primarily in Italy, Germany, Norway, and England (Mayer and Knox, 2006). However, the movement’s principles are quite capable of contributing a great deal to other countries that would like to implement sustainable urban development strategies. Turkey has decided to pursue the Cittaslow principles and has set up its very first case in Seferihisar in 2009. Seferihisar is now part of the Cittaslow international network that has over 160 members in 25 countries (CIN, 2012). It is a small town with the population of 27,422 people (TurkStat, 2012) and represents a distinctive landscape with its historical and archeological sites. In the framework of Cittaslow principles, the town has proposed an alternative development strategy with the desire to preserve its local values.

After becoming accredited, the local government executed some projects based on goals and principals of the Cittaslow movement. The aim of this study was to examine successes and failures of the major projects that were conducted in Seferihisar after accreditation. For this purpose, the case study methodology for landscape architecture was used (Francis, 1999; 2001). An evaluation form was designed to investigate both the successes and failures of the projects based on the Cittaslow policies and goals (requirements for excellence). The information was gathered from site visits and literature reviews for the projects. The results showed that Seferihisar was very successful in awareness, successful in environmental policies and infrastructure policies, but moderate for safeguarding autochthonous production, support to slow food activities and projects, finance and maintenance & management. It was poor for technologies and facilities for urban quality and hospitality. Eventually, by learning from its successes and failures, it is hoped that Seferihisar may be able to increase the successes and eliminate the failures.
Sustainable Development Along the Egyptian Red Sea Coast: Still Possible?

Amir Gohar, University of California, Berkeley, United States, amir.gohar@berkeley.edu
Mathias Kondolf, University of California, Berkeley, United States, kondolf@berkeley.edu

Keywords: Sustainability Land Use Planning – Tourism Planning – Red Sea - Egypt - Environmental Planning

The Red Sea is a unique environment, with deserts rich in history abutting a sea whose remarkable coral reefs are among the best in the world. With its striking environment and touristic potential, sunny climate, and short flight distance from major cities in Europe, this provided tremendous potential for economic development. Unfortunately, the area’s resources have not yet been utilized to their full potential. The earliest tourist development (in the 1980s and 1990s) centered near Hurghada has suffered from destruction of the fringing reef, coastal filling and excavation, and construction of mass tourism hotels, resulting in loss of much of the coral reef and marine contamination.

Innovative initiatives have taken place in order to protect the remaining parts of the red sea (From Marsa-Alam city Southward) including several guidelines by the Red Sea Sustainable Tourism Initiative (RSSTI) in 2000-2004 that focused on developing ecotourism and coastal planning for the region, followed by another pilot program named Livelihood and Income From Environment (LIFE) in 2005-2008 which supported implementing pilot projects in national parks to demonstrate examples of the appropriate process. Since 2008 to date there has been several initiatives to introduce sustainable practices (e.g., Solid Waste Management, Mooring Buoy practices) lead by local NGOs.

These efforts have resulted in some small improvements, but the basic the development patterns have changed little and not the anticipated widespread improvement. We identify these main obstacles: (i) An institutional problem wherein the responsible tourism and environment ministries do not coordinate with each other nor with other stakeholders, (ii) Practitioners use architectural and development models adopted in the Nile Valley, rather than adapting local practices to develop an architecture truly appropriate to the the Red Sea, and (iii) A lack of the understanding of the terrestrial and marine systems (i.e. drainage, soil, marine life, and terrestrial habitat) has helped make inappropriate land subdivisions and development in vulnerable areas.

We recommend the following to resolve these complex problems:
(i) Elevate the planning exercise above the ministry level, so planning need not be constrained by the portfolio and priorities of any one ministry, as currently the case.

(ii) Improve education in the architecture and planning professions so that practitioners are prepared to incorporate appropriate planning tools and building technologies in this unique environment, rather than attempt to copy from precedents in western countries.

(iii) Develop land-use suitability maps at scales appropriate to guide development at the parcel scale.
Sustainable Outcomes of a Flexible Grid: La Prusia, Nicaragua

Simon Bussiere, Ball State University, United States, bussiere@post.harvard.edu

Keywords: Sustainability, Ecology, Community, Infrastructure

The purpose of the study is to examine a unique ongoing project in its first phase of construction and will be presented through the lens of Mark Francis’ “Critical Dimensions of Case Studies.”

A growing informal settlement called La Prusia is centered along an unpaved 4km road that connects the city of Granada and Lake Apoyo to the west, both among the top tourist attractions in Nicaragua. This linear neighborhood, however, does not share the benefits of the tourist industry and has fallen into levels of extreme poverty. For many years a local nonprofit has been helping the (1000+) inhabitants by building homes through micro-credits, teaching children and providing technical training to the adult population. With a narrow 10 acre site that lies perpendicular to the road through La Prusia, the author and collaborators are currently in the process of building the first phase of the project being presented; a flexible model for sustainable housing and productive space in informal communities.

Topographic conditions and the existing productive tree canopy is key to the design. Critical root zones for productive vegetation are formally delineated across the site. A set of design principles is implemented to create a flexible urban armature around the critical root zones, within which infrastructure and other built form is sited according to an objective reading of existing conditions of the site. These principles can be applied by anyone building on site (local inhabitants, volunteers or construction crews) without substantial training. The site plan is explicit in programming through multiple-use zones within the canopy strategy rather than assigning uses in singularly functioning areas. The framework maximizes the potential for the function and performance of the clusters of homes and their immediate landscapes to expand and adapt over time, folding uses and agency into the semi-public landscape and private dwellings.

Protecting and utilizing existing productive trees while creating safe, productive and flexible housing clusters around social spaces within their dynamic canopy is the centerpiece of the project. However, the design framework is heavily complicated by anticipated spatial adaptations as socio-economic and ecological conditions improve over time. These complexities are seen as an opportunity to challenge the hard-lined traditional site planning and design paradigm that predetermines community functions and instead embraces flexibility as a sustainable design attitude. Development in La Prusia is not occurring through conventional means, but rather through the informal negotiation of resources and boundaries.
The Potential of Urban Agriculture to Mitigate Urban Heat Island Effects

Samantha Samples, Arizona State University, United States, samantha.samples@asu.edu
Edward Cook, Arizona State University, United States, edward.cook@asu.edu

Keywords: Urban Agriculture, Urban Heat Islands

Urban heat island mitigation efforts have increased in recent years employing various methods, including urban tree planting initiatives. While the benefits of using vegetation for heat island mitigation are well established (Chow and Brazel, 2012; Chow et al., 2011; Gober et al., 2010; Jenerette et al., 2011; and Shashua-Bar et al., 2011), legitimate concerns exist in arid regions regarding the increased water use required to support additional vegetation. Research indicates that combining trees with grass produces a synergistic effect, providing greater cooling benefits than either element planted alone. The shade cast by trees also helps reduce water requirements for grass (Shashua-Bar et al., 2009). While current research has focused primarily on the benefits of shade trees and/or grass, research is needed to determine the potential benefits of other types of vegetation. The research described in this paper explores the potential for combining trees with urban agriculture to provide similar synergistic effects with the added benefits of urban agriculture, identifying the potential for heat island mitigation and water reduction through the design strategy of planting trees and agriculture together. Through comparison of temperatures, water use and food output of several urban agriculture sites within the Phoenix metro area, an assessment of the benefits of combining trees with urban agriculture is expected. The on-going inventory and classification of existing urban agriculture projects and vacant parcels within the Phoenix area, when complete, will provide a baseline for assessing potential impacts at the regional scale. While still in the early stages of research, it’s anticipated that results will indicate urban agriculture does provide positive temperature modification and that combining trees with urban agriculture reduces agricultural water consumption. Given the increased focus on urban sustainability, identification of potential methods for mitigating heat islands and reducing water consumption is of vital importance for landscape architects and planners. Such activities also provide additional urban greening and increased food for residents. Risks to health and welfare from urban heat island induced temperature increases are wide-ranging, spanning from decreased human comfort outdoors and increased water usage and drought to heat related illness and deaths at the most severe end (Carter and Culp, 2010; Guhathakurta and Gober, 2007; and Harlan et al., 2006). Considering the severity of the risks from increased urban temperatures, methods to mitigate the heat island merit significant attention, especially from landscape architects and planners who are in a prime position to have positive impact on cities.
The Price of Comfort: A Cost-Benefit Analysis and Case Study of How Landscape and Architectural Design Can Reduce Human Dependence on Climate Control

Christine Edstrom O'Hara, Cal Poly San Luis Obispo, United States, cohara@calpoly.edu
Kristofer Holz, , United States, kristofer.holz@gmail.com

Keywords: acclimate, energy reduction, climate control, outdoor rooms

In the development of modern sustainable construction, there has been a focus on technological solutions. One of the most effective ways to diminish one’s carbon footprint is through reducing residential energy consumption. A simple component of residential energy reduction neglected in the literature is to better acclimate people to their local environments.

Since the advent of engineered climate control in the mid-20th century, humans have “forgotten” how to live with their local climate conditions. This study examines from both quantitative and qualitative perspectives how acclimation via landscape and architecture design interventions can reduce residential energy use. Examining a variety of climates in California, it conducts a cost-benefit analysis of reducing the square footage of enclosed residential space to quantify the savings in construction costs, energy infrastructure, and reduced energy costs. Those monies could be then spent on ecologically appropriate outdoor rooms that mimic the functional and spatial requirements of the home, requiring little to no extra energy costs. Case studies show a variety of options for the design of the outdoor spaces including a) multiple spaces around the building for movement with the sun and wind; b) moveable controls within a single space such as umbrellas, retractable overhead shade structures, and opening louvered fences for wind; and c) additive devices like fire pits to warm and water features to cool—all of which would also have aesthetic design qualities.

The value of the study highlights not only energy reduction through moving people to comfortable outdoor rooms, but considers the possibility that outdoor spaces that match the spatial and functional needs of indoor rooms could be accounted for in affordable housing requirements. Additionally, this way of thinking about design improves quality of life for the homeowner as they would spend more time outside. It weaves together a story of successful design solutions in all climates for true sustainable design.
The Productive Value of Non-Productive Space

Matthew Mccreary, Texas A&M University, United States, mmccre1@neo.tamu.edu
Jeffrey Slater, Texas A&M University, United States, sklater@gmail.com
Galen Newman, Texas A&M University, United States, gnewman@arch.tamu.edu

Keywords: Urbanization, Vacant Land, Abandoned Structures, Annexation, Development Patterns

Population growth, civic expansion and urbanization has fragmented core areas in many American urban environments, producing an immense amount of wasted land and leaving many cities replete with vacancy and abandonment. In addition, this non-productive space (a collection of vacant, abandoned, and brownfield sites) seems to grow proportionately with population growth. To assist designers, planners and land developers in the redevelopment of non-productive space, municipalities need to determine the productive value of this ubiquitous landscape. This research uses Fort Worth, TX as a case study site to develop a model to determine the proportion of non-productive space which holds an inherent redevelopment potential. Two primary research questions were posed for the test site: 1) Is there a correlation between civic expansion and urban core fragmentation; and 2) How much existing non-productive land actually holds a productive potential based on development, fiscal, and social values? To test the correlation, the city was broken into 5 mile buffer increments and spatial patterns assessing historic vacant land amounts and parcel sizes, abandoned structure distribution, population migration and annexation evaluated, using combinational GIS data from the City of Fort Worth, TNRIS, US Census, and the USDA. The model generated utilized suitability analyses which over-layered the developmental value (soil, slope, land cover, land use), social value (parks, proximity to landmarks, Population density), and economic values (market value and assessed value) of each parcel of non-productive space. Results indicated a correlation between annexation and spatial fragmentation of the urban core. While overall amounts of vacant land decreased, vacant land and abandoned structure amounts increased within the urban core as the city expanded, populations migrated toward the periphery, and parcel size decreased and became more irregularly shaped. Corollary, 13.1% of this non-productive space proved to have medium/high suitability for redevelopment (3,767 acres of land). This indicates that there may be a negative impact in infill development opportunities in the urban core area in expanding cities, promoting unsustainable peripheral development patterns. While non-productive space is replete in the urban core, only a fair amount of this space is easily developable, primarily due to low population, small size, and low economic worth. A model such as this could be used by cities to keep an inventory of their vacant, abandoned and contaminated lands, monitor and rank those lands which merit re-development, and act as a catalyst for ranking new retrofit, reclamation, and adaptive reuse design schemes.
Three Designs for the Lake Winnipeg Watershed: Fostering Ecological Literacy

Shawn Stankewich, University of Manitoba, Canada, umstanks@cc.umanitoba.ca
Brenda Brown, University of Manitoba, Canada, brenda.brown@ad.umanitoba.ca

Keywords: ecological literacy, eco-revelatory design, environmental education, Lake Winnipeg, landscape regeneration, sustainable water management, watershed, wetlands

This poster presents work intended to develop processes by which landscape architecture can promote ecological literacy. Ecological literacy, according to David Orr, is the ability to comprehend the complex relationships of one’s surrounding landscape and thus live life with greater environmental sensitivity. My research concerns how landscape architecture can foster ecological literacy regarding the regeneration of degraded landscapes. While inspired by writings of Orr, E.O. Wilson, and Eric Higgs, this work also draws on design and theoretical precedents found in the Eco-Revelatory Design exhibit and catalogue organised by Brenda Brown, Terry Harkness and Doug Johnston.* Although recent projects touch on similar issues, eco-revelatory design remains a relatively underdeveloped area.** Such research and design is important to understanding and developing landscape regeneration as integrated with community development, outdoor engagement and public education, all key in fostering ecological literacy.

The Lake Winnipeg watershed is home to over 5 million people, and draws water from four Canadian provinces and four American states. According to the Lake Winnipeg Foundation, about 8,000 tonnes of phosphorus enters the lake each year from sources including agricultural and urban fertiliser runoff, household products, and effluents. This nutrient loading creates large algal blooms that are toxic to humans and other species relying on the lake for survival. Aquatic ecosystems are damaged when the algal blooms die and decompose, consuming oxygen, making it unavailable to organisms.*** While wetlands act as filters for phosphorus and other nutrients, and slow water flow to the lake, it is estimated that more than 70% of Manitoba’s wetlands have been lost. Thus, restoring their function within urban and rural environments is vital to the lake’s recovery.****

The poster presents three landscape designs for the Lake Winnipeg watershed via detailed design drawings, models and short written descriptions. Each site is of a different scale and exists within a different context; the designs span urban, rural, and wilderness. All the sites are public spaces with potential for water-related remediation, research infrastructure, and development of land and water management techniques. The designs help mitigate eutrophication, flooding, and loss of wildlife habitat, while also being spatially and experientially intriguing and educationally engaging. All involve integrated design strategies for ecosystem regeneration, visual and spatial revelation, and educational programming. Techniques employed include juxtaposition and integration of scientific programmes (such as water monitoring and research) with environmental education, recreation, and the revelation of the site’s regenerative changes over time.
Urban Flow-Through Facilities’ Soil Media Compositions for Stormwater Quality and Quantity Improvements

Cory Gallo, Mississippi State University, United States, cgallo@lalc.msstate.edu
Robert Kroger, Mississippi State University, United States, rkroger@cfr.msstate.edu
Emily Overbey, Mississippi State University, United States, ego13@msstate.edu

Keywords: Urban Flow-Through Planter, Stormwater Runoff, Pollutant Removal, Soil Media

Nutrient overloading is a contributing factor to the impairment of surface waters. A recent remedy for reducing the amounts of nutrients entering downstream receiving waters is to filter stormwater runoff with infiltration based best management practices (BMPs). Stormwater BMPs for urban environments such as rain gardens, flow-through planters, and green roofs have been shown to slow peak flows and reduce the amount of nutrients that are washed from impervious surfaces. Nutrients such as nitrogen and phosphorus which are readily available in urban areas and conveyed by stormwater runoff are particularly crucial factors in the quality of surface waters due to their ability to inhibit ecosystem productivity. These BMP technologies are relatively new in design practice and their potential for nutrient removal is yet to be fully examined.

This interdisciplinary research project focused on small-scale, urban “flow-through’ planters for water quality and quantity improvements. This type of infiltration facility is intended for use in dense urban environments with little to no infiltration into in situ soils. Flow-through facilities are composed of a mix of topsoil, sand and compost. Similar research focused on the performance of BMPs on water quality showed significant reductions in nutrients and pollutants. These projects however focused on bioretention and were not set up to reflect how flow-through facilities are implemented in a real-world application.

The objective of this research was to replicate flow-through facilities that are currently used in practice and assess how they perform for water quality and quantity control. Eighteen aquaria were modified to model flow-through facilities in a practical application. Four different soil media mixtures were tested with a synthetic runoff solution typical of urban runoff which contained 2ppm mixture of nitrogen and phosphorus. A hydrograph was used to simulate the most intense 4.5 hours of a 2-inch, Type II 24-hour rainfall event and was applied to the aquaria using manually controlled flow rate pumps. Water quality data analyses indicate phosphate retention values ranged from (33-81%) and nitrate retention was poor across treatments (4-23%). Nitrate values showed export of phosphorus for some treatments. Preliminary results indicate the need for modification of the study design as higher infiltration rates in soil treatments reduced the residence time expected for the stormwater runoff in these facilities and as a result did not allow for the desired reduced peak flow.
Urban Design
Abandoned Spaces to Community Places: How Vacant Lots can be Transformed in to Healthy Civic Spaces

Rafael Egues, Auburn University, United States, eguesrg@auburn.edu
Charlene LeBleu, Auburn University, United States, leblecm@auburn.edu

Keywords: Vacancy, Civil rights, Historic

Peacock Place is a historic neighborhood in Montgomery, AL located on the final leg into Montgomery on the Selma to Montgomery Civil Rights Trail. But it seems history has forgotten this stretch of road reaching from the underpasses of I-65 and I-85 to what is commonly referred to as five points and the historic Cottage Hill area. Many of the homes and businesses along Mobile Street are vacant and a majority of the old structures have been torn down leaving empty lots in their place. This paper explores how transforming vacant lots into viable civic spaces creates places where young and old come together to share in a rich heritage and restore community pride.

Using overlay analysis I focused on the history of this neighborhood. Not only it’s history as the final leg on the historic Selma to Montgomery freedom march, but also it’s history as a part of Montgomery, capital of Alabama. This part of town, once known as Peacock tracts has a history, much older than the Freedom March and much richer. Charettes and interviews revealed stories about growing up in the neighborhood both before and after the major civil rights movement of the fifties and sixties. Information from these meetings paints a picture of where school children would go after class, where the teenagers used to party, shops their parents frequented, ice cream parlors, barbershops, auto repair shops and cinemas which were all important parts of this African-American community.

The picture woven through their stories is one of a once vibrant and proud neighborhood, one that by all accounts was paved over and torn apart by the interstate highway system built over where many of the civil rights leaders once had homes and led Sunday services. Many still attribute the location of the interstate to racial motivations. As vacancies have increased in this once great and historic neighborhood, efforts are being made to find ways to revitalize it and bring it back to it’s past importance as part of the capital city. Leveraging vacant properties in strategic locations creates community gathering spaces where generations engage each other in the past and present. The increased community engagement can be a driving force behind improved economic opportunities and provides a neighborhood where residents can earn a living and vacant spaces can be re-inhabited.
Building a Sustainable Urban Landscape: Adaptive Re-Use of Transportation Infrastructures

Hooman Koliji, University of Maryland, United States, koliji@umd.edu
Mohammad Gharipour, Morgan State University, United States, mohammad@gatech.edu

Keywords: Urban Landscape, Adaptive Re-use, Sustainability, Transportation Infrastructure Facilities

Late 19th century and mid 20th century urban environments in the US witnessed flourish of mega structures. Construction of piers, elevated rail systems, bridges, roads, transportation related structures facilitated the passage of the transforming city to the future. Over time, and changes within the society such as advancements in transportation infrastructure, some of these structures were partially or fully abandoned. However, unique location of many these structures within the context of growing metropolises, calls further attention to integrate them into the existing urban life and fabric. Heavily industrialized in appearance, these structures often times are adjacent to or surrounded by contemporary live environments, which are in constant demand for public realm. An emerging trend of adaptive re-use projects has targeted the late 19th early 20th transportation related structures, appropriating them to a new mode of public realm. This new wave revisits these abandoned urban infrastructures vital to the new sustainable urban environments rather than trying to eliminate them as dysfunctional elements. This approach maintains socio-historical context of structures while offering environmental solutions. Particular attention will be given on the multifaceted aspects of a comprehensive sustainable solution.

This paper concentrates on structures pertaining to urban infrastructures in the United States, which largely were in use till the mid of the 20th century. These are discussed in terms of theoretical discussions in the literature and their potential for future re-use in the contemporary context. Changes in their context, (i.e. social, economical, and environmental) calls attention for creative and sustainable solutions in devising new trajectory for these structures. Using case studies such as Navy Pier in Chicago, High Line in NYC, this paper aims to critically analyze the failures and successes of these projects in terms of planning as well as design and post-construction use. Comparative studies of adaptive re-use precedents of similar significant in the Europe provide the supporting material for a critical analysis of these structures. Concluding remarks examine how a comprehensive sustainable solution of adaptive re-use design incorporates past and present and possibly the future of both social and environmental context, building a new landscape in the city.
Children's Use of Pathways; Independent Mobility and Playing along the Way

Adina Cox, North Carolina State University, United States, adina_cox@ncsu.edu
Robin Moore, North Carolina State University, United States, Robin_Moore@ncsu.edu

Keywords: children, pathways, Independent mobility

Independent mobility for children has declined in the United States as a result in changes of the built environment and in family lifestyles that have occurred over time. This presents a challenge for children as independent mobility may offer activities that support many developmental needs, including physical activity, exposure to nearby nature, the gradual gain of independence, and opportunities for social engagement with peers. Play is increasing recognized as important in the healthy development of children. How can play be supported to encourage children to “go outside and play” along the pathways? What are the activities that support play for children and support interactions between parents and children?

Research conducted on greenway paths that wind through residential neighborhoods examines the potential opportunities and impediments to independent mobility for children in American urban neighborhoods. This research has shown that dense vegetation may increase parental fears, and that dense vegetation may limit the use of pathways by children and adolescents. On the other hand, pathways with high visibility may offer active transportation alternatives that decrease fear of traffic.

Pathways supported activities that included socializing, observing nature, and physical activity. Play pockets that were dispersed along pathways increased the duration of time spent in the park. Children were drawn to wildlife and play equipment, and bridges. Diversity of the built environment encouraged a diversity of activities. This research included parental surveys and behavior mapping at four sites in the United States: Chattanooga TN, Springfield MO, Cary NC, and Richardson TX. Sites were selected based on the addition of play components (Chattanooga and Springfield) and the proximity of greenway paths to residential neighborhoods (Cary and Richardson).
Complete and Safe Streets: From Policy to Practice

Farhad Atash, University of Rhode Island, United States, fatash@mail.uri.edu

Keywords: Complete streets, policy, practice, challenges

Background and Objectives: Many states and municipalities across the United States are adopting “Complete and Safe Streets” policies to address the safety, interests and conveniences of all users, such as pedestrians, bicyclists, drivers, transit users of all ages and abilities, in the design and construction of transportation projects. “Complete Streets” policies promote the development of walkable and public transportation-oriented neighborhoods, districts and communities.

This paper addresses “Complete and Safe Streets” policy and its practice across the United States. Specifically, the paper has three objectives. First, it discusses the elements of a “Complete Street” policy and its different benefits. Second, it discusses the implementation of the policy at the state and local levels. Third, the paper ends with a list of challenges that need to be addressed in order to minimize the gap between policy and practice in the future.

Methodology: This paper is based on an extensive review of the literature and uses a case study approach to investigate the “Complete Streets” policy and its practice in the United States. The analysis is conducted at two geographical levels: State (e.g. New York, North Carolina, Florida, Illinois, California, Oregon) and local (e.g. New York City, NY; San Francisco, CA; Portland, OR; Boulder, CO; Wilmington, NC).

Findings: The strongest “Complete Street” policies are those that are based on a community vision, are sensitive to the community context, are clear in intent and address all users and transportation modes. The policy must apply to new construction, reconstruction and retrofit projects. Short-term, creating one or two “complete” streets would generate positive support in the community. Long term, however, it is critical to adopt a network approach that aims for a connected and integrated network that provides transportation options to different users and their different destinations. Also, adopting appropriate performance measures would allow measuring the progress toward the desired outcomes both short and long terms. The successful transition from policy to practice at the local and state levels requires overcoming institutional, regulatory and financial challenges.

Significance: Landscape architects, planners and transportation engineers play an important role in shaping the future of the transportation system in every community. The transportation system defines the quality of life and has to balance the needs of the pedestrians, bicyclists and transit users with those who drive. “Complete Street” policies offer a new vision that promotes greater public safety, stronger economy, cleaner and sustainable environment, and a healthier nation.
Conjoined Nature in Buildings

Daryl Carrington, Temple University, United States, kdcarrin@temple.edu
Brian Ledder, Temple University, United States, brian.ledder@temple.edu

Keywords: conjoined nature, integrated natural systems, buildings

“In Nature we never see anything isolated, but everything in connection with something else which is before it, beside it, under it, and over it.” -Johann Wolfgang von Goethe

This paper explores the potential of plants, microbes and soil to replace engineered building systems. The term ‘conjoined nature’ is used to describe the use of these living materials to perform building functions efficiently and economically. Conjoined nature has significant implications for the environmental impact of individual buildings, and their collective impact on cities and regions. Much has been written about the ecological design of cities, (Beatley), but little focuses on the integration of natural systems to provide building level services. The pursuit of sustainable outcomes for buildings indicates the need for conjoined nature design.

The natural ecology of producers, consumers, nutrient recycling, and decomposers, powered by the sun and supporting the biogeochemical cycles (Miller) is seen as a model to be emulated in buildings. Buildings rely primarily on mechanical systems for water treatment, air purification, heating and cooling to regulate our environments. Thus, buildings are consumers. We suggest conjoined nature can be used to perform the functions of producer, nutrient recycling, and decomposing to reduce building consumption of energy and resources, while enhancing large scale natural systems.

‘A green roof is an example of a conjoined nature. Green roofs (Coffman) are being used for stormwater management as a building service. They may also provide habitat and encourage biodiversity (ecological services), and they provide a thermal barrier and greater roofing material life to the building (building services). Biowalls (Nedlaw) and living machines (Todd) are additional examples of conjoined nature. These elements are typically add-ons to buildings, used to perform a single function. We propose a prototype for an integrated conjoined nature approach: a bio-atrium that includes a living machine, biowall and edible plantings. The bio-atrium relies on decomposers to purify the air and water, and recycle nutrients. It relies on producers to fix carbon, oxygenate the air and grow useful plants. The bio-atrium can be scaled appropriately for buildings of different sizes, and provides an aesthetic amenity as part of its multi functional purpose. Most important, the building’s ecological footprint is reduced.
Cross-purposing the Easement: A Case Study in River Easement Use in Tokyo, Japan

Sean Burkholder, Pennsylvania State University, United States, slb59@psu.edu
Jun Hashimoto, Japan, junhashimoto@yahoo.com

Keywords: Tokyo, Urban Rivers, Japan, Easement

Tokyo is a city of rivers, and like New Orleans, shares an intertwined history of earth filling and land expansion. Human interventions have left a significant portion of the city below sea level, protected by huge levees, sea walls and dams. This landscape of flood control extends into many parts of the city and in many cases constitutes the only large contiguous areas of green space within the hyper-dense urban fabric. This paper will look particularly at the Edogawa river which separates Tokyo prefecture from Chiba to the east, and the Tamagawa river separating Tokyo from Kanagawa to the south. These two rivers were designed with large floodplains between the earth levees and the river itself. These floodplains were intended to withstand the strong seasonal flooding delivered to the Kanto plane (where Tokyo is located) from the surrounding mountains, while the levees were designed to protect against more serious typhoon and tsunami events. The floodplains range in size but can give a river with a width of 150 meters over 500 meters of room to expand before reaching the base of the levees.

The floodplains remain dry most of the year, awaiting the seasonal rains. Floodable or not, any open space in Tokyo is considered a luxury. The nation of Japan, who owns the easements of the river, leases these floodplains to adjacent municipalities to be used for various types of recreation. While most floodplain use is sanctioned by the government, other informal occupations such as migrant housing are also tolerated. Tent camps, horse tracks, golf courses and soccer fields all feel commonplace along the rivers. This paper will first explore the range of uses that exist in these floodplains through maps and photographs. The paper will then draw connections between these uses and the utilization of similar right-of-ways in the United States – where these areas regularly constitute myopic, discomforting wastes of land. This exploration will extend beyond the right-of-ways of rivers and will include a broader study of the typological relationships between easement uses and the types of infrastructure the easements are abutting. The intent of the research is to locate possible synergies to promote new forms of mixed use projects and administrative arrangements that better utilize infrastructure-adjacent landscapes.
Degrees of Life and Complexity in Istanbul Informal Settlements

Noah Billig, University of Arkansas, United States, nsbillig@uark.edu

Keywords: informal housing, squatter settlements, degrees of life, generative development, urban design

This study measures the degrees of life and complexity in two informal settlements in Istanbul, Turkey - Karanfilköy and Fatih Sultan Mehmet. Living structure and wholeness are constructs in generative design theory and are operationalized as degrees of life and complexity by Salingaros and Alexander (Alexander 2002a; Salingaros 1997; Klinger and Salingaros 2000; Salingaros 2006a). Generative theories in urban design, planning and architecture are based on step-by-step, adaptive processes that unfold over time. Much of the thought in generative urban design theory is influenced by complexity theory and inspired from physics, mathematics and biology (Alexander, 2002a). Common examples of this are vernacular settlements in traditional societies that were built in incremental processes. Generative urban design theories are in an exciting, expanding stage. New research is being conducted and generative structures and processes are becoming operationalized (Alexander 2002a). Perhaps most relevant to this study, more case studies – particularly in modern settlements - need to be evaluated (Mehaffy 2008). This study provides modern cases from ostensibly generatively built informal housing settlements in Istanbul (Salingaros 2006b).

This study uses Salingaros’s arithmetic function to measure the degrees of life and complexity of places in Karanfilköy, Fatih Sultan Mehmet, and outside test cases for construct validity. The degrees of life are recorded using photographs taken by the researcher, an on-site degrees of life evaluation, and the researcher’s personal recollection of each site. This study uses systematic unaligned grid sampling (Dixon and Leach 1977; Gilbert 1987; Ripley 2004) to select 16 observation points in each settlement.

The results indicate the average degree of life for all sites in both settlements is 37.88. This average is lower than many of the architectural masterpieces analyzed by Salingaros (2006a). However, it is higher than most of the famous 20th century places Salingaros analyzed (2006a). There are certainly aspects of the buildings that could be improved in order to raise the degrees of life scores in the settlements. However, it can be concluded that Karanfilköy and Fatih Sultan Mehmet contain sites with a higher degree of life than most modern 20th century places – particularly the modern outside test cases analyzed by the author and the modern examples analyzed by Salingaros (2006a). This study provides a contribution to generative urban design theory through these modern case studies. It shows the degrees of life and complexity that can result from generative forms of self-organization.
Designing Dredge: The Role Dredging in the Urban Landscapes of Great Lakes

Sean Burkholder, Pennsylvania State University, United States, slb59@psu.edu

Keywords: Dredge, Sediment, Urban Ecology

Sediment is a ubiquitous externality of the human race. Almost every anthropogenic land management practice contributes in some way to the process of sediment dislocation. Travelling with water, this sediment generally migrates to the mouth of a waterway. Historically, cities were also located at the mouths of these rivers. The continued development of these cities required waterways capable of managing industrial shipments. Even today, these waterways are continuously inundated with sediment and require dredging to operate properly as industrial resources.

Many coastal cities take advantage of dredged soil by constructing land for development. This practice makes sense in areas where the value of this land outweighs the cost of its creation. Examples in Asia and the Middle East are commonplace and include the filling in of Tokyo Bay, the creation of Lingang City in China and a range of recent projects in the Persian Gulf. Even in America, areas of cities such as New York and Boston exist on reclaimed land.

A different condition exists in cities where land is less valuable. For this we can look at the post-industrial cities of the Great Lakes region. Many cities in the Great Lakes Basin have faced tremendous population loss in the past 50 years and have an abundance of underutilized land. Here, the value of creating new land is negligible and the disposal of dredged material equates roughly to the disposal of municipal waste. Because of this, the basin is thoroughly freckled with sediment dumping grounds – some submerged within the lakes themselves, while others sit as islands or peninsulas adjacent to a sediment-loaded waterway. All of these landscapes were constructed by engineers, within the largest freshwater resource in North America, with little consideration toward what role they would play after they were filled.

This paper intends to communicate urban landscape issues including: 1) the scale of the dredging within the Great Lakes 2) an overview of the range and typologies of dredge landscapes that exist within the basin and 3) a discussion of these unique landscapes as they relate to both the urban public and local ecology. This will be achieved by the dissemination of research undertaken in the summer of 2012 within the basin and augmented with student work from a studio conducted in fall 2012 looking at the specific landscape implications of dredging in Toledo, Ohio – where 1/3 of all dredging in the Great Lakes Basin occurs.
Dispersed

P. Richard Perron, University of Manitoba, Canada, perron@cc.umanitoba.ca

Keywords: dispersion, seeds, aggregation, assembly

For some time now I have had a preoccupation with the idea of dispersion. Perhaps it has had to with the increasing emergence of our virtual world, and the seemingly disaggregated notions regarding the meaning of place. Yet as we consider the very idea of dispersion it becomes clear that to disperse may also be about a kind of sorting, the way that the dispersion of light through a prism results in the separation of colours, to disperse can be about ways of organizing a natural world, and ways of arranging space and place.

This paper begins with an ecological perspective, examining an inventory of local native species through the lens of the dispersal mechanism of seeds. We then ask the question of how seed dispersal may be considered as part of large scale design strategies (the scale of current landscape urbanism projects) at first as planned projects and then as a form of guerrilla gardening at the scale of the city. Design examples are developed for two Canadian cities.

The last half of the paper returns to the idea of dispersion as a vehicle for urban design inquiry. I compare the difference between the dispersion of materials versus the dispersion of forces as ways of thinking about landscape processes. Three strategies for comparing the dispersion of material and forces are developed: - disaggregation and aggregation - disassembling and assembling - deterritorialization and territorialisation I show how dispersion can be a manifestation of landscape change and how designers may engage in the actualization of the dispersive potentials of landscape phenomena. I return to a discussion of dispersion in the sense of the actual and the virtual, illustrating how virtual dispersal mechanisms may in fact inform and reconnect us to place.

Learning outcomes for this paper are two-fold. First, the paper includes a brief summary of seed dispersal mechanisms including a discussion about the possibilities and predictive difficulties of using dispersion as a temporally based design approach. This involves an examination of ecological theory and a discussion of how it may be applicable to landscape urbanism. Secondly the paper shows how dispersion may be considered through a deeper lens, and how we may begin to grapple with the complexities and differences between the dispersion of organized systems (illustrated, for example, in the difference between disaggregation and disassembly), and how the idea of dispersion may serve as a powerful design metaphor.
Does More Centrally Located Schools Promote Walking to School?: An Exploratory Study using the Closeness Centrality Index

Hyung Jin Kim, Kansas State University, United States, hyungjin@ksu.edu
Chanam Lee, Texas A&M University, United States, clee@arch.tamu.edu

Keywords: Spatial centrality index, walking to school, school siting, Clearance Perry

Background: Schools used to function as an important physical and social center of a neighborhood/community. Clearance Perry conceptualized schools as the center of a neighborhood and neighborhood boundary as a walkable “school service sphere” (Perry, 1925). However, with the shift in the contemporary urban development patterns often anchored by retail-commercial uses, the central roles of schools in shaping neighborhood forms have diminished. School siting issues have recently been revisited as part of the growing effort to promote walking to school. However, compared to the large number of studies on other built environmental factors, school centrality has not been fully examined.

Purpose: This study examines the association between school’s spatial centrality indices and children’s walking-to-school behavior. The hypotheses are that more centrally located schools will have higher proportions of students walking to/from school; and school centrality will vary across different community settings (urban, suburban and rural).

Methods: To measure the centrality of school siting within the delineated neighborhood boundary, such as the school attendance zone, this study employs the Spatial Centrality Index which indicates hierarchical and structural associations of locations (nodes or paths) within the urban networks. The assumption of this index is that more central parts (nodes) of the networks will have higher frequencies of experiencing the paths within the boundary (Tversky, 1993; Crucitti et al., 2006; Tomko et al., 2008).

This study examines 71 elementary schools in Texas, located in urban, suburban and rural areas. The data are from classroom tallies (travel mode), parental survey and Geographic Information System, collected from 2009 to 2011. Among various spatial centrality indices, this study uses closeness centrality (Cc) which measures the average length of the shortest paths from a school location to all other street nodes in the designated spatial boundary (school attendance zone).

Findings: According to the preliminary analyses (bivariate regressions), school’s Cc (Min: 0.014, Max: 3.031, Mean: 1.175) was positively associated with children’s walking to school (B=0.344; p=0.004). Also, significant differences were found by school setting (ANOVA F=8.792; p<0.000) in the order of urban (Cc=1.465) – the most central, suburban (Cc=1.037), and rural (Cc=0.419) – the least central.

Conclusions: School’s spatial centrality may play a significant role in student’s walking behavior. This study can contribute to quantifying the concepts of centrality and to offer evidence-based guidance for policies and practices related to school siting and attendance zones delineation to promote walking-to-school.
Equity and Urban Design, Why Time and Place Matter

Kristine Miller, University of Minnesota, United States, mille407@umn.edu

Keywords: urban design, equity, cities, youth

The purpose of this study is to examine the roles of urban design and landscape architecture in achieving regional equity. Equity can be defined as “fair and just access for all,” and is tied to specific areas of research including health equity, transportation equity, educational equity, etc. Each area points to ways in which the design and planning of cities directly impacts people’s ability to access resources and opportunities. For example, health equity researchers have studied the design of pedestrian systems and their impact on childhood obesity. Transportation equity researchers have studied the relationship between mobility and poverty. Environmental equity researchers have studied the disproportionate exposure to toxic chemicals in communities of color.

What does equity have to do with the practices and products of urban design? Using a case study approach, this paper examines the ongoing design and planning of the West Broadway Corridor in Minneapolis to understand how the processes and products of design and planning impact underserved neighborhoods. Specifically, this study examines design proposals produced by Hennepin County and the City of Minneapolis for the West Broadway Corridor to understand the ways these proposals impact “fair and just access” for North Minneapolis residents. Particular attention will be paid to the degree to which the design proposals create safe pedestrian networks for youth and children and enable them to safely access schools, after school programs, parks, parkways, and job centers and whether youth have been able to participate in official planning and design decision-making processes.

North Minneapolis is rich in diversity but has for years faced disinvestment in its social and physical infrastructure and residents face some of the highest crime, poverty and unemployment rates in what is otherwise a fairly safe and wealthy city. In some Northside neighborhoods nearly 50% of the residents are under 18. Within the Twin Cities disparities in economics, health, education and housing are among the worst in the nation. Minneapolis’s four-year high school graduation rate in 2008 for white students was 69.5% for African American students it was 33.5%.

Our analysis showed little improvement in spatial connections for youth to existing resources, and almost no attempts to involve youth in the decision making process. Our recommendations include design strategies make safer pedestrian crossings at intersections connecting import youth-related community assets and methods to involve youth in future neighborhood planning efforts.
Greenways Going Further: Can Greenways Systems Theory Bring Synergy to the Rest of the City?

Jim Brown, Morgan State University, United States, jimbrown8@msn.com
Archana Sharma, Morgan State University, United States, archana.sharma@morgan.edu

Keywords:

There is significant discussion on the role of greenways along natural corridors providing recreation and environmental services in cities (Gobster & Westphal 2004, et al) as well as the role of greenways creating synergy on differing scales addressing sustainability and connectivity in urban areas (Sharma 2010). Additionally there has been an emerging discussion of how Detroit and other “blighted” rust-belt cities are turning to urban agriculture and other progressive land uses to address sustainability, community development, and urban infill (Reed, 2012 et al).

This project will critically review if and how cities such as Baltimore can use currently established design approaches to address the under utilization of space and lack of connectivity which have resulted in urban fragmentation, population loss and declining economic activity over recent decades. Can we use current design approaches to retrofit the city - in turn creating a more sustainable city and therefore a more democratic city or do we need new thinking and new design approaches?

Through this project that investigates greenway systems in Baltimore, I ask the following questions relevant to further greenways theory:

(a) What are the gaps between urban greenways theory, urbanism, ecological urbanism, progressive land (re)use trends such as urban agriculture, and adaptive place making?

(b) How can landscape architecture provide new design methods? Through this project, I will investigate whether current strategies can be applied within the context of Baltimore’s three greenway systems and the urban built environment between the greenways.

(c) What are the reasons leading to fragmented spaces in the in-between spaces which separate the greenways?

Summarily, this project aims to re-imagine the fragmented city of Baltimore as a synergenistic whole. Methods of literature review, field studies, interviews and iterative deductive-inductive reasoning guide this project. The project is a two phase study where the First phase examines whether and to what extent the sustainability, synergism, and systems oriented approaches to landscape design and planning, especially adaptive greenway networks could play a role in re-imagining an integrated Baltimore. The Second phase critically reviews if and how ecological design approaches paired with environmental justice approaches to enhance the infrastructure of a city minimize barriers to regional accessibility, civil society, healthy lifestyles, and economic opportunities. The underlying intention of this research is to look at how the built environment in between greenways can be adapted to create a meaningful sense of place and synergy to an emerging greenway network.
Identifying Perceptions of the Creative Class Regarding Lost Space in Downtown Dallas

Yao Lin, University of Texas at Arlington, United States, yao.lin@mavs.uta.edu
Pat Taylor, The University of Texas at Arlington, United States, pdt@uta.edu

Keywords: urban space, lost space, creative class, perception

This presentation deals with perceptions held by members of the “creative class” (Florida 2004) regarding lost space (Trancik 1986) in downtown Dallas, Texas. Data from this study come from face-to-face interviews with end-users (the creative class) of lost space, and the results of the study offer insight on design and use of these spaces, so common to contemporary human communities.

Trancik (1986) argues that lost space consists of undesirable and seemingly useless urban spaces, which because they are problematic, need to be redesigned. Trancik contrasts the urban voids of lost space with positive urban spaces which he defines as those with “traditional values and meaning” (p. vii). However, Trancik’s examples of what constitutes “undesirable” and “useless” space, such as a parking lot, are not consistent with the perceptions of end-users in a contemporary urban environment (Visser, 2010), meaning that which specific urban areas are “lost” and which are “positive” is not clear. In fact, Trancik projects his personal values and meanings into the definition of lost space, which in this research is considered to be prescriptive lost space, rather than seeking an understanding of positive urban space from the perspective of end-users, which in this research is considered to be descriptive lost space. Past research on lost space suggests that it is important to consider end-users’ perceptions of their environment because space only becomes place when it is given contextual meaning by end-users (Jacobs 1961; Trancik 1986; Whyte 1988; Fields 2005). However, little of this past research includes interviews with end-users, leaving the characteristics of descriptive lost space poorly defined.

Indeed, having a more complete understanding of the characteristics of descriptive lost space is important to design a world in which end-users perceive their own values and meanings in urban areas. Therefore, this research investigates the characteristics of lost space according to end-users’ experiences by searching for distinctions between prescriptive and descriptive lost space. Because the most insightful characteristics of descriptive lost space come from end-users who are highly involved in a city’s economic, technological, and social structures, whom Florida (2004) calls the creative Class. According to Boden (2004), creativity creates a heightened ability to sense unique patterns in the environment; therefore, Florida suggests the creative class has more opportunity to drive positive changes in its surroundings, meaning that urban designers can benefit from the perceptions held by these end-users.
Landscape Urbanism Meets Ecotopia: Remaking Seattle’s Central Waterfront?

Jeffrey Hou, University of Washington, United States, jhou@uw.edu

Keywords: Waterfront, landscape urbanism, urban design, Seattle

Stretched across two miles of shoreline along the Elliot Bay, the Central Waterfront has been a subject of intense debates in Seattle in the past decade. The process began following the Nisqually Earthquake in 2001 that severely damaged the Alaskan Viaduct on the waterfront, and brought attention to the aging seawall below (Hou, 2006). Since 2001, several design charrettes have been held and alternative plans were developed. Voters in Seattle also went to the ballot box repeatedly to weigh in on different rebuilding options. In 2010, the City of Seattle embarked on the latest effort to redesign the waterfront and selected James Corner Field Operations as the lead designer. As a firm that is synonymous with the landscape urbanism movement, the Central Waterfront project provides an opportunity to examine how the discourse of landscape urbanism is translated into reality. Based on participatory observations during committee meetings and public events, this study examines how the project and the discourse of landscape urbanism intersect with the social and political realities in Seattle, a city known for its obsession with public process and civic virtue. Two main findings are presented here. First, when compared against the tenets of landscape urbanism (see Waldheim, 2006; Corner, 2006), the project seems to have fallen short. Instead of strategies for instigating and reorganizing activities on the waterfront following the removal of the Viaduct, the proposal is represented by static rendering of open spaces and streetscapes as the primary outcomes. On the other hand, the project appears to have effectively navigated the political process in Seattle, leading to generally positive support from the public and the City Council. The political success of the project so far has largely been achieved through management of the city staff and the involvement of highly committed stakeholders and volunteers who are involved in multiple aspects of the project including design oversight, outreach, and financing. While, the actual results of the project remain to be seen, the two preliminary findings here suggest a gap between the design work that is still framed by disciplinary boundary and biases and the political processes that are critical to a project’s success. These suggest that for landscape architects to become effective leaders in positive transformation of the urban environment, they need to mobilize a wider repertoire of planning, policy, development, and civic engagement tools that are just as important as the design discourses and strategies.
Linking the Park to the Bay: Realizing John Nolen’s 1908 Plan for San Diego

Thomas Schurch, Clemson University, United States, tschurc@clemson.edu
Michael Stepner, NewSchool of Architecture + Design, United States, mstepner@newschoolarch.edu

Keywords: Greenways

Purpose
This work’s purpose is development of a contemporary design outcome for landscape architect John Nolen’s unrealized vision for linking Balboa Park to San Diego Bay as proposed in his 1908 comprehensive plan for San Diego.

Background
Balboa Park – a product of Nolen’s genius reflected in San Diego’s 1908 comprehensive plan – was to be linked to San Diego Bay by a lengthy promenade. While this facet of the Nolen work was not implemented, various local interests wish to see it realized. The basic “charge” of this work is to “marry” these two important elements – the Park and Bay. Working within natural and human cultural factors shaping San Diego and its region, three particular elements were of significance: the urban fabric between the park and the bay, the city’s coastal canyonlands, and Balboa Park.

Methodology
Three facets of methodology factor into this work. First, was application of a reiterative physical design and planning process resulting in a resource data base comprising natural and human cultural elements of the project area, data analysis, design development, and design outcomes that were tested through critical analysis. Second, a historical methodology was applied that was published data based, for purposes of understanding the site context through time. Lastly, “expert witness” input supplemented the resource data base, historical data findings, and design development.

Findings
Design outcomes reflect positive findings regarding realizing Nolen’s 1908 vision. To this end, a design solution for the park-to-bay reflects contemporary design theory regarding sustainability and San Diego’s considerable growth over the past 100 years. Therefore, the original Nolen promenade linkage between the bay and park gives way to a set of linkages that combine coastal canyon parkland, green streets, a funicular, and expansion of the his vision to include a trail system from the park to the Pacific Ocean.

Importance
The importance of this work is fourfold. First, it reflects the historic significance of landscape architecture embodied in Nolen’s plan. Second, it demonstrates landscape architecture’s ability to build on an historic legacy within a 21st century contemporary context. Third, the work applies the important and tested approaches of large-scale park systems such as those of 19th century Boston and Kansas City, but through precepts of sustainability and urban design within a 21st century context. Lastly, the work underscores “quality of life” issues relative to urban form and human experiences therein, natural habitat, and strategies for implementation to those ends.
Master Planning for the Arts: Identifying the Skills and Roles for Landscape Architects

Jack Phillips, University of Texas at Arlington, United States, jr.phillips.osda@gmail.com
Taner Ozdil, The University of Texas at Arlington, United States, tozdil@uta.edu

Keywords: Art: Art Master Planning

An arts master plan is a tool to create a community that embraces the local arts as a unique and vital resource which shapes and reflects the city’s cultural identity, while leveraging the arts as a key component for an overall economic development strategy (Markusen and Gadwa 2010). Although, the extent of rigorous arts programs/plans for cities may go as far back as the National Endowment for the Arts (NEA) in 1967 (Jacob 1995) there is limited understanding of the role and function of these plans as part of systematic research, not to mention the professionals who are associated with writing the plans, or of their implementation and their management. More importantly, the role of landscape architects on the creation of an arts master plan has not been explicit, even though crafting arts and the placement of art in the built environment has been one of the professional services provided by landscape architects.

This research examines the suitability of landscape architects to lead the design and development of arts master plans for communities by assessing current arts master plan practices in major US metropolitan areas. It first identifies the needs of the arts master planning process through systematic documentation of expert opinions, then compares them to the scope of master planning for the arts. This scholarly inquiry not only searches for prerequisites and professional aptitudes needed to successfully complete a community art’s master plan and assess the role of landscape architects but also positions landscape architecture and arts master planning within the broader context of planning process of large cities in the US.

The research follows qualitative data collection and analysis techniques (Taylor and Bogdan, 1998). First the research documents the role landscape architects have played in arts and master planning in the past. Then, selected major metropolitan area arts master plans in the United States are reviewed. Finally, research utilizes interviews with experts to systematically document and gain greater understanding of the arts master planning process in major metropolitan areas.

Research illustrates that the skills and abilities landscape architects possess seem to be parallel with the required knowledge needed for master planning for the arts. However, professionals who are involved with such plans also argue that it is more of a lack of understanding of the professional domain of landscape architecture that limits landscape architectural roles within the planning process for arts in large metropolitan areas in US.
Modular Habitat

Katherine Bennett, Ohio State University, United States, bennett.755@osu.edu

Keywords: urbanism, agriculture, ecology, environment, social practice

The siting of agriculture within contested landscapes of the city poses a promise to redress and even capitalize on social and environmental problems long associated with urbanism. The press on food security and climate change alongside the apparition of foreclosure and displacement makes urban agriculture a highly fundable public design project. The conflicts that projects carrying these keywords purport to negotiate cross territorial scales and boundaries of ‘city’, ‘country’ and ‘nation’. They also cross thresholds of the spaces we call home, changing norms of private and public habitation in the city.

Last June the Ohio State University funded my research seed grant proposal for “A Demonstration Pilot for Urban Agriculture, Ecology and Entrepreneurs” $75,000. The project is a collaboration between me as PI and faculty in OSU’s agroecology, horticulture, public health, business and urban planning programs. We have two funded extramural partners: a community center, The Godman Guild, and a local food nonprofit, Local Matters. We began over the spring and summer terms by designing and building – with students – a ‘modular habitat’ garden in the Guild’s back yard – sharing space with a Head Start playground. The modular habitat is a portable plastic agricultural structure (aka ‘hoop house’) that increases productivity organically by sheltering plants and extending their growth season. It re-scales for different residential spaces of the city – the apartment balcony to the rental duplex back yard to the vacant lot community garden. Our agroecology collaborator and his PhD students have completed a cold season planting, to be followed by nutrient data collection, harvest yield analysis, cost-tracking, business planning, educational programming for future urban farmers, and evaluative pre and post surveys. We’ll use our seed data next year to apply for federal funds to refine and expand our garden model.

More than 90% of people documented as living in the project’s ‘Economically Distressed Area’ rent their homes. Uncounted ‘others’ are homeless, and most residents move frequently. The university is partnering with a local developer and public-private funders to gentrify the post-industrial neighborhood, adjacent to OSU’s main campus. So the project addresses prevalent problems of resource access, unemployment and land tenure by emphasizing cheap, adaptable, DIY systems for year-round entrepreneurial food production. Our raised beds constructed transparently of metal fencing, rebar and weed barrier grow not only human food but also bamboo – a sustainable building material to replace pvc as the framing for future modular habitats.
Nature in the Indian Mega-City: Locating Identity and Place

Amitabh Verma, University of Georgia, United States, averma@uga.edu

Keywords: Nature, India, Urban landscape

The contemporary Indian city is generally characterized by a physical and perceptual marginalization of nature and its elements, spaces and systems. This inadequate acknowledgment of the importance of the landscape is an undesirable condition which curtails nature's beneficial aesthetic, functional and ecological contributions to the built environment. Current development, shaped by increasing financial, spatial and social constraints, accentuates this marginalization, especially in mega-cities such as Mumbai, which are significant because their exaggerated scales of urbanization represent future developmental trends of cities nationally. The value derived from a comprehensive inclusion of nature within the fabric of the city makes it imperative that urban development reflect a greater integration of the landscape as a vital component.

This paper critiques current implementation practices which interpret the landscape as detached from its philosophical and ecological foundations. The study focuses on the Andheri West neighborhood of Mumbai, which manifests developmental patterns and social organization representative of broader national trends. It evaluates the inclusion, perception and treatment of the landscape, framing prevailing attitudes in the context of their cultural, historical and ecological underpinnings. The term ‘landscape’ is interpreted both as its large-scale expression as parks, gardens and plazas, and as small-scale, individual representations of vegetation. Inconsistencies between landscape perception, representation and treatment are revealed and explored.

The discoveries and findings presented emerge from archival research into the ancient traditions of nature veneration and tree worship which constitute a significant part of India’s history (Malla 2000, Sinha 2006), and which continue to inform common perception to a substantial degree, incorporating trees as central to religious and social ceremonies and rituals. Literature research is complemented by on-site observation, evaluation and documentation of the implemented landscape and its efficacy, undertaken by the author over a period of six weeks in June and July 2010.
Northern Mexican Land Reserves: Urban Habitat Reconciliation on the Periphery

Gabriel Diaz-Montemayor, Arizona State University, United States, gmontema@asu.edu

Keywords: urban periphery, polyvalent infrastructure, water management, land use shift, social interest housing, low income housing, US-Mexico border region, northern Mexico.

The purpose of this study is to catalog, measure, and analyze the existing opportunities found in the peripheral urban vacant land in northern Mexican cities for polyvalent infrastructural fields which potentially provide with enhanced capacities for urbanization following a model where natural systems and urban systems coexist harmonically.

In the first decade of the 21st century Mexico experienced an unprecedented development of low income, social interest, subsidized, housing. With the ejido -land grant- reform of the early 90’s, most of the urban peripheries of Mexican cities were opened for sale and land use shift from agriculture to urban land. Millions of homes were built lying isolated and marooned in extensive urban peripheries. Most medium to large cities in the country enlarged their urban land areas to provide with additional cheap territories for the low income subdivisions. Unfortunately this led to a housing overstock of the typical social interest types which later paired with the surge of violence and crime in the border region and the economic crisis starting in 2008. Today most of these cities, Tijuana, Mexicali, Hermosillo, Ciudad Juarez, Chihuahua, Monterrey, to name the most relevant, display large vacant areas with scattered housing spots separated from work and service centers increasing the living costs of the already poor communities.

The research involves the collection and comparative analysis of the Planes Directores Urbanos –urban plans- and other planning studies, such as water management analyses, of these cities as developed and approved by the multiple local decentralized planning institutes. The study draws development trajectories to reveal time frames and spatial models for the consolidation, or not, of these large urban land reserves into actual urbanized areas. The various urban peripheries are then graphically populated with the inclusion of the existing, or the revelation of deficits, of water management systems, energy pipelines, mobility and transportation lines (including these already planned), and traces and patches of agricultural activity which suggest a field armature requiring relatively low investments for the reception of new developments while enhancing the connectivity and integration of the existing subdivisions on the urban edges.

The results of this comparative analysis provide with conclusions which suggest potential collaborative efforts amongst the local planning institutes, practitioners, and academic institutions, to explore shared issues and solutions for the betterment of the peripheral urban condition, one where artifice and nature are brought together with social cause for those living on the urban edge.
Reasserting the Temporal: Shrinking Cities and Urban Vacant Lands

Joern Langhorst, University of Colorado Denver, United States, joern.langhorst@ucdenver.edu

Keywords: Post-industrial landscapes, shrinking cities, urban vacant land, temporary use

All landscapes are created and influenced by a variety of human and non-human forces, processes and agents over time, and, to varying degrees, characterized by complexity and contestation, their inherent variability, and by the diversity of expectations and values projected onto them. Very few places render these qualities and processes more clearly than the landscapes created by the often rapid, decisive and significant changes occurring in urban contexts around the globe, in particular in cities that are subject to significant growth and decline cycles. The ongoing restructuring of large economic sectors, deindustrialization, drastic shifts in populations in terms of quantity and quality are all processes that contribute to the emergence of tracts of land that are currently not subject to active use or inhabitation. Such "urban voids" can span several categories – brownfields, greyfields, the notorious decay of large areas of residential development in places like Detroit and Philadelphia to the small "leftover" odd-shaped site of several hundred or thousand square feet at the end of a block. The same processes are also responsible for often equally drastic redevelopment, making large tracts of previously vacant or underdeveloped lands disappear overnight.

Regardless of condition and context of urban vacant lands, most responses advocate complex, officially sanctioned, formal "solutions" that call for or depend on implementation over several multi-year phases. These approaches privilege a particular, long-term temporal "scale" on which cities and their elements appear to operate: Historic buildings and open spaces and parks create an implicit "norm" of longevity and permanence - offset by the (economic) realities of urban re- and de-development that operate in considerably shorter timeframes.

This paper suggests to understand urban vacant land as an inevitable by-product of all processes of urban development, and to treat it as a resource instead of a problem. The paper critically examines projects that attempt to realize this potential as a resource, comprising a variety of responses that are temporary, incremental, flexible and experimental, and are based in an understanding of both the varied temporal and spatial scales of urban development processes. The proposed "temporary use model" emphasizes the ability of urban vacant land to provide numerous short- to mid-term benefits, uses, infrastructural functions and meanings that are frequently absent in marginalized and other neighborhoods, thus addressing issues of social and environmental justice and urban sustainability.
Share the Road – A Tool Kit for University Campus Complete Streets: The case of The University of Maryland

Mingyu Cui, University of Maryland, United States, ozone@umd.edu
Byoung-Suk Kweon, University of Maryland, United States, kweonb@umd.edu
David Myers, University of Maryland, United States, dnmyers@umd.edu

Keywords: Complete streets, campus roadway segments, campus roadway facility, roadway improvement.

In 2011, the 112th Congress House passed the Safe and Complete Streets Act (HR. 1780), which defines a complete street as “a roadway that safely accommodates all travelers, particularly public transit users, bicyclists, pedestrians (including individuals of all ages and individuals with mobility, sensory, neurological, or hidden disabilities), motorists and freight vehicles, to enable all travelers to use the roadway safely and efficiently”. As a reflection of the evolving of the “Complete Streets” concept, this bill is intended to ensure the rights-of-way and safety of all roadway user groups, rather than only the pedestrian and cyclists, once it is passed the Senate (S. 1056). Based on these legal provisions, and as a response to the Complete Streets movement, this paper will review the literature on the legislation, safety, public demand, educational functions and sustainability aspects of the need for urban roadway systems to accommodate multimodal traffic, especially in university campuses.

Through the review of the literature related to this topic, this paper intends to document whether current roadway facilities of the University of Maryland College Park campus is adequate and efficient for daily behavior of all user groups or whether facilities that ensure the order and safety on our streets are missing. Based on a survey done by the Department of Transportation Services, the paper identifies and analyzes the issues. And further discussions on a campus closed to private vehicles will be done based on the published results from a pilot trail of temporarily closure of Campus Drive, one of the campus’ arterials Therefore the paper will explore the improvement of campus roadways to accommodate some of travel means currently used by the university community but not designed for, and discuss the benefits of implementing complete streets principles for the campus roadway system based the analysis mentioned above. Furthermore, the paper provides several suggestions on sustainability and education aspects and addresses how our campus roadway system could provide its user groups with more sustainable travel choices. This paper could also serve as precedence for future discussion on roadway system improvements in similar university campuses that are considering the adoption of complete street facilities.
Shoehorning Native Plants into Urban and Exurban Environments

Margaret Livingston, University of Arizona, United States, mlivings@email.arizona.edu
David Myers, University of Maryland, United States, dnmyers@umd.edu

Keywords: native plants, Sonoran Desert, Appalachian oak forest

City planners are increasingly evaluating their open space opportunities as needs for green infrastructure continues to grow. In tandem, as surrounding natural habitats continue to shrink, these urban landscapes are seen as opportunities for preserving or re-introducing native plants that exist or existed in surrounding undisturbed ecosystems. The authors will focus on the successes and challenges of reintroducing and maintaining native plants in remnant, sometimes small areas in relatively non-native regions. In particular, this research focuses on studies and projects being done that emphasize use of native plant species in various city land uses, including greenway buffers, commercial easements, and streetscapes. Comparisons are made between two distinctly different regions and the contributions to native green infrastructure in their respective regions. The first author will discuss the various strategies that City of Tucson and Pima County, Arizona are using to reintroduce native vegetation in urban and exurban settings with the intent of maintaining these sites with no irrigation following establishment. The predominant natural biotic community in this region is Lower Sonoran desert scrub. The second author will report on the investigation of the success of afforestation easements and their relationship to the size of easement, the land use type (e.g. residential or commercial), and age of easement in Montgomery County, Maryland. Potential natural vegetation here was predominantly Appalachian oak forest which has been heavily impacted by extensive deforestation, agriculture, and more recently extensive and rapid suburbanization. Select easements were investigated and documented. Strategies for selecting and maintaining appropriate native plants and their characteristics in urban and exurban environments will be discussed that are broadly applicable to other regions. These strategies are intended for use in the planning of projects involving native plant introduction in urban and exurban environments.
Space in Time: Temporary Intervention as Urban Design

Nancy Rottle, University of Washington, United States, nrottle@uw.edu

Keywords: urban intervention, temporary design, urban design, public realm, public life, public space activation, participatory design, public art

"Looking at the city as a constantly changing stage, forever reinventing and defining itself on the basis of its performers' creativity and interaction... artistic interventions... deliberately rediscover performative strategies that reflect the theatrical possibilities of urban space." - Klanten and Hubner (2010 p. 173)

While urban design has traditionally aimed at shaping permanent infrastructures, it increasingly involves the ephemeral, theatrical and emergent, and relies upon human activity as both generator and measure of quality. In post-industrial remnants, forgotten and redundant infrastructure, empty modernist spaces, underused parks and waning business districts, temporary design insertions may serve to revive urban spaces, making them safe, useful and compelling. Approaching the city as theater, with temporary interventions injected by both sanctioned and unsanctioned artists, can activate space so that it becomes inviting, meaningful and exciting. Such actions may catalyze a culture of "city life," as advocated by Jan Gehl and exemplified by Copenhagen's successful urban open space network. Gehl writes, "People are spontaneously inspired and attracted by activity and the presence of other people." (2010 p. 65) Design that stimulates public use therefore can become reciprocally self-reinforcing, with users becoming agents in creating and perpetuating lively public spaces.

Temporary installations can also serve as instruments of site analyses, testing how the public reacts or how a design prototype interacts with water and weather. Setting up "pilot" projects that temporarily introduce new situations -- such as traffic modes and patterns -- can be an effective strategy to encourage new behaviors and promote acceptance of radical environmental changes. And, in a paused economy, temporary installations are viable strategies to fill stalled construction voids that render deadening holes in the urban fabric.

This paper explores the potentials of space activation through the roles of temporary works in both informing design and cultivating a culture of vibrant urban public life. The paper presents a typology of drivers for temporary public space interventions, and illustrates each with examples from cities in the US and Europe. Included as examples are three projects developed as educational studies, including temporary installations in public spaces employed as site analyses in the studio curriculum, and a published guide to alley activation. The paper will reflect on the transition from urban design as a set of permanent, enduring environmental features, to emergent spaces and ephemeral activities and events that engage users as public space activators and participatory urban designers.
Space, Time, Place, Duration: The Evaluation of Designed Urban Landscape Through Public Social Media Activity

Robert Hewitt, Clemson University, United States, hewitt@clemson.edu
Brooks Patrick, University of Stockholm, Sweden, brooksp@kth.se
Geoff Taylor, ESRI, United States, gtaylor@esri.com
Hala Nassar, Clemson University, United States, hnassar@clemson.edu

Keywords: Social media, crowdsourcing, big data streaming, urban design, landscape

The extraordinary growth in social media use, is prompting the development of new evaluative methods to understand the relationship between the individual and urban landscape. Advances in smartphone GPS and the increased use of location-based social media have enabled a shift in analytics from global to large-scale urban trends, local instances and their immediate spatial context. The paper advances previous methods of using location-based social media to characterize urban space by extracting location based Twitter use within the London Olympic Park and Village Complex during periods surrounding the 2012 Olympic Games from July 21st until August 11th. The analytical scope of the survey encompasses a range of site specific textual, temporal and geo-location data generated from 63,897 instances of Twitter communication by 13,844 unique persons over the period in question. Specific areas of analysis addressed in the paper include geospatial densities, textual sentiment and temporal movement patterns associated with active and passive space, Olympic venue site context, pedestrian circulation and transportation routes, parkways and surrounding urban fabric.

Preliminary findings from the crowd-sourced surveys suggest that:

• Social media communication associated with the Olympic Park and Village cluster around place specific urban features such as arenas, hotels, restaurants, transit locations, and public space.

• The greatest amount of social media communication takes place within the athletic venues and in the public space immediately surrounding these venues.

• Significant social media communication occurs along the London Way and Stratford Walk which are the primary pedestrian corridors connecting the venues.

• Park space adjacent to the River Lea exhibit a very dense clustering of tweets which contrast the distributed intensity along the main circulation corridors.

• The clustering of tweets within the Olympic Village, responsible for housing athletes for the duration of the games, reveals that certain demographics were not present on Twitter.

• The Olympic Park and Village site boundaries exhibit a buffer like condition related to social media communication.

The findings offer exemplary big data analysis methods for GIS that correlate life cycle processes with intended use of a large scale designed landscapes. The findings also provide worthwhile methods for evaluation of socially mediated urban space defined by place and mobility patterns associated with “momentary life-log-ging via Twitter.”
Sustainable Master Planning with Metrics: Review of a Mixed-use Student Housing Development at Texas A&M University

Joohee Lee, Texas A&M University, United States, jl49625@neo.tamu.edu
Bruce Dvorak, Texas A&M University, United States, bdvorak@arch.tamu.edu
Ao Shi, Texas A&M University, United States, aoshi@neo.tamu.edu
Pengzhi Li, Texas A&M University, United States, lpz12eric@gmail.com
Xianpeng Liu, Texas A&M University, United States, b5r7l3d3@tamu.edu
Sinan Zhong, Texas A&M University, United States, zsn198838@tamu.edu

Keywords: Sustainable development, LID technique

Contemporary land development often ignores important components that work to build a sustainable community. This is the case in College Station, Texas, where a one hundred twenty-three acre student housing complex is being considered for redevelopment. The primary goal for this project was to design a mixed-used student housing complex that promotes ecological and social sustainability. We measured the success of our approach with five metrics: transportation, storm-water management, wildlife habitat, urban agriculture, and cultural and historical significance of the site.

To promote a walkable community we developed integrated transportation system. Specifically, we reduced the number of driveway access points from 10 to 6 to improve pedestrian safety; we proposed two additional bus stops, and increased bicycle parking spaces from 27 to 234.

Low Impact Development (LID) storm water management techniques, such as green roofs, rain-gardens, bio-infiltration, and permeable-pavements, were installed on 72.7% (89.4 acres) of the site. This provided effective storm water management and also improved economic benefits. Specifically, these LID-techniques manage about 50.9 million gallons/year of total runoff volume resulting in a profit of about $2,000/year in reduced annual water treatment costs.

Our plan improved habitat for the migrating Monarch butterfly with an additional 24.6 acres (20%) of the total area. To develop habitats for the butterfly, several fundamental elements were considered such as shade, sunlight, soil, water source, nectar plants, and plants for the caterpillars.

Urban agriculture on the site has been increased from 0.55 acres to 2.33 acres to meet 19% of the needs for fruits and vegetables of all residents. To achieve this goal we propose vine trellises, green houses, and raised planters. This design will promote resident’s health, improve the living experience, develop new agriculture technology, and provide job opportunities for students.

To link the identity of the site to traditions of Texas A&M University, we employed a large circle at the center of the site symbolizes the spirit of the 12th man as “Aggies united”. To create a welcoming transition from the commercial area to campus area, we propose a university logo on the intersection of University Drive and Texas Avenue. In addition, the streetscape along University Drive is designed to follow that in Northgate district, such as height of building, spacing of building, color, open space, etc, so travelers will have constant and integrated sense about streetscape.
Swale Demonstration Project: A Case for the Use of Alternate Plants

Elizabeth Payne Tofte, Mississippi State University, United States, ep523@msstate.edu
Barbara Lien, Consultant to Spokane County Stormwater Utility, United States, barblien@mac.com

Keywords: stormwater, bio-infiltration swales, demonstration project, planting design

This paper contributes to our understanding of the functional and aesthetic aspects of bio-infiltration swales for stormwater management in residential settings. The purpose of this paper is to present the interim results from a 5-year longitudinal study jointly conducted by the Washington State University Extension and Spokane County Stormwater Utility, partially funded by a grant from the Washington Department of Ecology. The aims of the study were to raise awareness of the value of swales in protecting water quality, and to test the viability, effectiveness, and aesthetics of alternative plants versus turfgrass in swales. Twelve sites in Spokane County, Washington were selected to participate in the project. All of the swales were located in residential front yards, and all property owners agreed to participate in the project by allowing their existing swales to be excavated, refilled with an engineered soil mix, and then planted with either turfgrass or alternative plants. A qualitative preference survey was conducted with all participating homeowners at the beginning of the project, and again at the 5-year mark. Spokane County Stormwater Utility has performed quantitative soil chemistry monitoring and observation of the swales for 5 years, and they expect to continue until clear conclusions can be drawn from the data. The outcome of this study might influence policy changes in areas where grass is not the preferred vegetative cover for stormwater swales. From a design standpoint, more flexibility in the appearance of swales might redefine their status as landscape amenities rather than simply functional features.
The “Pedestrian Realm” as a Genesis of Commerce: Bazaars of the East and Mixed-use Centers of the West

Zoha Niazi, The University of Texas at Arlington, United States, zoha_niazi@yahoo.com  
Taner Ozdil, The University of Texas at Arlington, United States, tozdil@uta.edu

Keywords: Pedestrian realm, commerce, mixed-use centers, bazaars, urban design, public spaces, urban landscape

Commerce is an ancient economical framework that enables establishment of social ties, improving cultural relationships, and trading values as well as commodities (Edgu et al., 2012). Although the commercial activity is driven mainly by the strategic placement of greater transportation networks among production and economic centers in macro scale the products typically has reached its destinations (customers) through pedestrian spaces and networks such as Bazaars in the East and malls and centers in the West. The presence of people has been a key to successful urban public space (PPS, 2005, Marcus et al., 1998, Gehl, 1987) and commerce has been the primary activity of such spaces for over centuries. Yet increasing vehicular and transportation activity and changing commercial dynamics of contemporary cities in both East and the West have been adding more pressure to pedestrian spaces and networks (Morgan, 1996), requiring further examination.

This research is to document and assess the physical make up of the pedestrian realm in mixed-use commercial settings of the East and the West in order to gain greater understanding of pedestrian environments’ roles and characteristics. The goal is to inform design and planning of similar urban areas with cross-cultural references. The study focuses on three acclaimed sites in each setting; Southlake Town Square, Legacy Town Center in Plano, and West 7th Urban Village in Fort Worth in Texas, USA, and bazaars of Tabriz, Isfahan and Kerman in Iran.

This research utilizes qualitative methods and case study analysis techniques to investigate the relationship between pedestrian realm and commerce. Interviews are conducted with three stakeholder groups: pedestrian, designer and developer/planner, following procedures suggested by Taylor and Bogdan, 1998. The research also utilizes observations (Marcus et al., 1998; Francis, 2001) as well as map analysis techniques (Wheeler and Koo, 2011) in order to further examine the physical make up and the spatial configurations of these settings.

Research illustrates that commerce oriented centers of the East and West are culturally influenced environments but their pedestrian realms have various common physical qualities that can inform future design decisions. Although it is hard to argue whether the pedestrian realm is the genesis or commerce, both the commerce and the quality of pedestrian realm are found to be equally important. Research also highlights various physical qualities that are unique to each case or setting reminding that design and planning of such environments require critical understanding of regional parameters while exploring cross-cultural references.
The Infrastructure of Food

Jacob Boswell, Ohio State University, United States, boswell.33@osu.edu

Keywords: urbanism, urban agriculture, peri-urban agriculture, food processing, local food, food security, food sovereignty

In recent years urban and peri-urban agriculture, as they relate to local food movements, have emerged as a topic of considerable design attention and scholarly debate amongst landscape architects, architects, urban designers and planners. The vast majority of design and planning work on this topic has focused on agricultural production, the essential act of growing food, ways in which that is accomplished, and the capacity of that act to reshape the environmental and social health of our cities and regions (Despomier 2010, Duany 2011, Hodgson 2011, Milburn and Vail 71, Mougeot 2005, Redwood 2009, Viljoen, Bohn and Howe 2005, White, Przybylski and InfraNet Lab 2010,). Yet, food systems are typically divided into several constituent parts inclusive of: production, processing, distribution, retail and wholesale marketing, consumption, waste recovery, and education (De La Salle and Holland 2010). Simply put, local food production alone cannot hope to adequately address issues of food sovereignty and/or food security, or to succeed in reshaping urban and peri-urban environments. The purpose of this paper is to focus on the infrastructure necessary for food processing, the transformation of raw food into value added products. A review of the literature shows that processing is as an important and intellectually under served factor in food movements, but that processing is needed if local food movements hope to influence consumption patterns on a broader scale and have impact on urban and peri-urban landscapes. I begin with a review of existing literature on the role of food processing infrastructure in sustaining local food systems. This is followed by case studies of two peri-urban community based food processing facilities in Ohio and their impact on local food and agriculture in their respective regions. I conclude with an analysis of a proposed community based food hub and processing facility in Columbus, Ohio and recommendations for future food processing facilities, the role that such facilities have to play in creating sustainable local food systems, and the role that designers and planners can play in their realization.
The RUBAN and the Phalansteres

Dietmar Straub, University of Manitoba, Canada, dietmar.straub@ad.umanitoba.ca

Keywords: Periphery, Urban Prototypes, Sustainable Urbanism

Design for the RUBAN describes the author’s research interest in the urban periphery, which embraces the entire metropolitan area without regard for municipal boundaries. Topic of the discussion and the investigation will be the role of landscape architecture dealing with periscapes – neither city nor countryside.

The common codes of perception are still not prepared for this space, largely because they are stuck in the mould of traditional images that clearly differentiate between urban and rural as two easily separable systems of classification.

Although we are aware of the inadequacies of such a distinction between the city and the countryside, we have not yet had time to develop a new way of looking at things that truly encompasses new spatial phenomena. Instead, we fuss about the uniformity of the boundaries we perceive whenever we fly into a major airport anywhere in the world, and then complain about the heterogeneous nature of their composition as we travel into the center. Our ability to “build up a picture” is still overwhelmed by a jumble of centralising figurative elements and utterly functionless voids, between extreme artificiality and neglected wilderness, and between provincial privacy and anonymous urban lifestyles. Is there an alternative to the amorphous conglomeration of “ruban” settlements?

The space in question is northwest of Winnipeg, Manitoba. The countryside has retreated and the city has not yet arrived. Winnipeg will continue to grow, people from all over the world will continue to migrate to Winnipeg and it seems only a question of time that Winnipeg’s fringe will turn into one of these contemporary, amorphous urban areas. In this imaginary context undergraduate students of the University of Manitoba have sought to somehow locate or “situate” utopian communities ideally consisted of 5000 people working together for mutual benefit. The design studio functioned as a laboratory for urban prototypes. Based on classical models and concepts a wide variety of neighbourhood visions have been transformed. What would be the task of a landscape architect if Gropius, Le Corbusier or Ildefons Cerdà would have been involved. The aim was to explore what is possible in principle and to confirm following assumption: How we care about urban peripheries will be of eminent importance reconsidering the future of the city.
The Urban Revolution: Roles for Landscape Architecture in the Twenty-first Century
Global Urban Transformation

Neil Korostoff, Pennsylvania State University, United States, npk1@psu.edu

Keywords: urban growth, nonformal settlements, developing countries, advocacy planning and design, 21st century

The purpose of this study is to explore the roles landscape architecture may play in the expected massive expansion of cities in the developing world during the twenty-first century. Demographers from the United Nations and other international organizations are predicting 2.5 billion new people will be added to the world’s population in the next 90 years, all of that growth occurring in cities in the developing world. Overall population in the developed world will continue its historic slow contraction and rural populations in developing countries will stabilize or decline. But cities in the developing world will add billions of new people, largely in informal settlements, during this period. The problems of unplanned, over-crowded slums, barrios, favelas, geckondu and shantytowns will multiply and become socially and environmental untenable. While a majority of the world’s population already resides in cites, the twenty-first century will transform the earth into a global planet.

Landscape architects, architects and urban planners are engaged with the process of urbanization in the developing world via several modalities. Many work for state and municipal governments and planning agencies that attempt to guide and control urban growth and development via laws and regulations. Others work closely with developers and contractors in the feverish contest to supply these burgeoning populations with housing and services. Very few if any are engaged at the level of policy. Still, urban growth in the developing world is often an informal, self-authored process whereby rural migrants flock to cities and build housing and communities with their own hands in loci of opportunity. In this very common scenario professional planners and designers do not participate in the process of urbanization.

A few landscape architects and design professionals are engaged directly with communities and NGO’s in trans-disciplinary advocacy efforts to address the issues of informal communities in the developing world. They build upon the rich professional tradition of community-based, participatory design to assist people with the physical and social transformation of their communities. This study will examine the efforts of those trans-disciplinary teams in Asia, the Middle East, and South America in an effort to document patterns of study and practice that may guide future efforts. The study will create narratives of trans-disciplinary work in urban communities in the developing world to inform and inspire students, faculty and practitioners to engage in this supreme twenty-first century challenge for the future of the global city.
Topographically Calibrated Density: Towards a Suburban Template for Steep Sites

Karl Kullmann, University of California, Berkeley, United States, karl.kullmann@berkeley.edu

Keywords: suburban development, topography, terracing, urban design, planning, steep site engineering

Background: Many sprawling cities around the world have used up the available flat building land, forcing development into difficult building locations that include very steep slopes. With the aid of heavy earth-moving techniques, the “suburban dream” of detached houses on concrete slabs are able to be realized irrespective the underlying topography. This has resulted in steep landscapes being remodeled into large-scale terraced earthworks that erase the endemic terrain. From both ecological and urban design perspectives, this does not represent an ideal template for sustainable metropolitan growth. However, the dominant 20th century urban models have had little impact, with modernism, ecological planning, and traditional urbanism all being premised on the block-grouping of urban density codes. Natural topography, however, is far more variable and nuanced.

Purpose: This research project is founded upon the premise that fixed mono-density urban codes are a significant contributor to the problematic misfit between contemporary metropolitan peripheral expansion and topographical terrain. The research aims to test the hypothesis that a “continuously variable” urban density model that is finely calibrated to the terrain of the site can foster more topographically sensitive urbanism. Moreover, the research aims to audit this flexible urbanism against the principles of best practice urban design.

Importance: Within the disciplines concerned with the design of cities there exist no sound models for designing urbanism that respects and is enhanced by topography. As cities become progressively more expansive due to population growth and begin to need to retreat to higher ground due to sea level rise, developing this model becomes increasingly important.

Methods: The research is framed around two case studies of steep sites that have recently been developed using standard suburban layouts with terracing. The East Bay hills (California) site represents common dendritic geomorphology, while the Perth (Australia) site is representative of the sand dune terrain as found in many coastal areas. Using a range of criteria that include reducing the height between terraces and maximizing lot size diversity, a series of modeling scenarios test various permutations of associations between urban layout/density and topography.

Findings: the research demonstrates that it is technically possible to design suburban layouts in a manner that reduces the need for extremely high terracing. However, this inevitably involves reevaluating some of the criteria that underpin best practice urban design, in addition to building technology, engineering standards, real-estate biases, and consumer expectations.
Transient Landscapes and Urban Design

Akiko Ono, University of California, Davis, United States, akikoonoakiko@gmail.com

Keywords: Transient Landscapes and Urban Design

This research paper stems from an urban design studio, its research objective and the design outcome in student work. It explores the concept of small scale, public urban design typologies such as the plaza, square, and farmer’s market, as portals that can reveal the larger forces of nature and the passage of time, as well as urban connections to ecological systems, infrastructure, and socio-economic networks. In particular, it will look at “temporality” in varied forms such as time-shared programming or climate and seasons.

Why transient, small scale urban landscapes now?

In recent years, we have witnessed increasing numbers of so called “transient projects” from farmer’s markets, and “Parklets” to popup stores, springing up in cities everywhere. This trend is in part a direct response to a dire economic situation, a stop-gap measure in the effort of urban revitalization where bigger and more permanent projects are stalled. It may also be due to rising public awareness of grass roots community activism that proposes urban revitalization through small-scale and affordable interventions, or even as a critique of a car-oriented society. Our inquiry will delve into how temporary programs, time-share uses, and occupations, structure and transform their physical spaces as they take place. Additionally, we will investigate the belief that landscape is more than an objective physical construction, but that it is both the projection and product of the viewers/users of that landscape. In this regard, it is this paper’s ambition to challenge the professional design norm of “what you see is what you get”- a common phrase, reducing spatial design to a mere concrete object. Alternately, I will look for more expansive notions of space and place, reaching to the realms of philosophy, sociology and cultural theory.

The paper will be divided into two parts. The first half will focus on the research defining transient landscapes in urban design. The investigation begins with a comparative study of different farmer’s markets in the Bay Area, California. This comparison intends to assess how different locales, demographics, networks of product, and even ideologies are brought together temporarily, to reveal and evoke the different social and agricultural landscapes of the region. The second half of the paper will focus on urban space/landscape design proposals that offer potential for transient programming and activation, as well as unique revelations of a regional landscape and a place in time.
Travelling Across America in one Place: The phenomenon of the interstate village

Alf Simon, University of New Mexico, United States, asimon@unm.edu

Keywords: interstate village, urban design, highway culture

The US interstate system has been studied in different disciplines, each bringing a perspective to the workings and impacts of this extensive and ambitious infrastructure system. The research project that is the subject of this paper focuses on one particular landscape that has evolved within the system: the interstate village - defined here as a commercial node at a non-metropolitan interchange where the interstate passes within a mile or two of a town. The interstate village is ambiguous - It is a part of the ‘place’ and identity of the interstate system, but also is related to the town with which it is associated.

There have been a number of localized studies done on non-metropolitan interchanges related to economic development (Boarnet 1997, Gambel et al 1966, Twark 1967, Cribbins et al 1965) and land use change (Briggs 1981, Everly et al 1987, Humphrey and Sell 1975, Moon 1987, Theil 1965). Moon (1987) looked at non-metropolitan interchange morphology in one region, in the context of central place theory. However, there has been very little attention and study devoted to the Interstate village in a cultural context as ‘place’, and on the ‘village’ phenomenon as an emerging urban type.

This study asks whether interstate villages, regardless of regional location, exhibit strong common physical and compositional characteristics, as a part of the interstate system, while also reflecting more subtle local or regional identities through their town attachments.

Sixteen interstate villages at non-metropolitan interchanges were studied on a sample transect along I-70 from Denver to the beginning of the Pennsylvania Turnpike. Each of the villages was observed in accordance with the following attributes:

- spatial organization/ morphology
- cognitive qualities/ announcement
- perceptual character
- regional expression

Town managers were also contacted and surveyed with a standard list of open-ended questions.

The findings from this one sample transect indicate that there is a striking spatial and cognitive similarity among the villages, and sameness in visual character. There is minor typological variation, and very little regional or local expression, except for regional corporate character. The study has significance for disciplines including Landscape Architecture, Architecture, Urban Planning, Urban Design, Geography, Engineering/transportation studies, and Sociology. It will help in understanding the form and trajectory of a twentieth/twenty-first century settlement type and will contribute to our knowledge of the road culture and the culture of mobility in North America.
Using Planning Support Systems in Neighborhood Planning for Transit Station Development: Perceptions of Planners and Community Organizers

David Pitt, University of Minnesota, United States, pittx001@umn.edu
Michael Greco, University of Minnesota, United States, mgreco@umn.edu
Todd Graham, Twin Cities Metropolitan Council, United States, todd.graham@metc.state.mn.us

Keywords: planning support systems, visualization, landscape performance evaluation, planner perceptions

The Twin Cities Metropolitan Council (MC) is constructing a light rail/bus transit system in the Twin Cities. Staff from MC, community organizations, and planning agencies will use planning decision support systems (PSS) in neighborhood planning around new transit stations. This presentation examines the perceptions of local planners and community organizers toward potential use of three “off-the-shelf” PSS (i.e. CityCAD, CommunityViz, and Envision Tomorrow) in station planning.

In four focus groups, 14 local planners and 11 community organizers viewed 20-minute demonstrations of each PSS. Through facilitated conversation, they evaluated the system’s capacity to: a) engage stakeholders in the development of neighborhood plans; b) present believable visualizations of station development; and c) evaluate performance implications of station construction on neighborhood environmental quality.

Coding of meeting transcripts suggested that none of the systems was clearly preferred. CityCAD enabled the iterative, rapid generation, and less sophisticated evaluation of crude 2-D and 3-D representations of design proposals. Participants were not entirely satisfied with the visualization/representational or scenario evaluation capacities of Community Viz. Despite its robust power in evaluating development impacts, the inability of Envision Tomorrow to provide 3-D visualization limited its value for station-area planning.

Participants viewed PSS as useful for focusing discussion and creating shared understandings of alternative scenarios, but they were skeptical that design exploration could (or should) be undertaken in participatory settings. Both groups preferred that project sponsors perform preliminary planning, design, and impact analysis before engaging the public. Planners were disappointed with the inability of PSS to produce information needed for design development of transit stations.

For community representatives, the value of visualization tools depended upon language barriers and stakeholders’ knowledge of planning/design concepts. The “cartoonish” nature of the visualizations risked underwhelming or insulting the public but also provided an invitation for public engagement in refining design concepts.

Planners viewed PSS technology as potentially off-putting to selected audiences and potentially focusing disproportionately on minor design details. They were also concerned about the data demands and technical expertise required for system use and the potential for inaccurate or unreliable data to skew outcomes. Community representatives were wary about hidden assumptions inherent in the data used to populate the models.

Current generation PSS technology allows public involvement in generating, rendering, and evaluating alternative neighborhood plans. Use of PSS must be balanced by concerns of potential users relative to representational issues and the social and political contexts in which the systems are used.
Vacancy As Opportunity

Carey Clouse, University of Massachusetts Amherst, United States, careyclouse@gmail.com

Keywords: shrinking cities, productive landscapes, vacancy, urban farming, infill

INTRODUCTION
From the Oregon Trail to the Vegas strip, development in North America has followed a mission of outward expansion, steady growth, and participation through consumption. This ideology has driven urban policy even in cities that suffer from endemic population loss, and appear to be so fundamentally broken as to defy conventional solutions. Rather than acknowledge the unique opportunities inherent to a shrinking city, governmental, economic and professional forces instead invoke growth-oriented models of urban development. The assertion that urban progress relies on growth is one that stipulates an inherently unsustainable city planning agenda. While successful development has historically hinged upon civic growth, many intrinsic economic, social and environmental opportunities exist in the shrinking city. As urban communities look for new ways to integrate food security and sustainable fuel sources, this drosscape offers itself up as a panacea to the problem.

METHODOLOGY
By developing a taxonomy of different agricultural approaches for urban landscapes, this work reveals the types of conditions and factors necessary to implement a successful model for shrinking cities. Ecological variables, economic variables, and community-impact variables can be considered together or independently as the criteria upon which a site may be understood. These myriad factors play important overlapping roles, which will be viewed through the lens of New Orleans case studies.

PRECEDENTS
More than 60,000 vacant or blighted properties languish in New Orleans, more per capita than Detroit. Each of these parcels represents embodied energy that is taxing to the city, from the accretive costs of monthly lawn mowing to the more elusive figures linked to unemployment, vandalism, and cultural loss. A small fraction of this abandoned and underused land in New Orleans has already transitioned towards food and fuel production.

OUTCOMES
With a focus on reimagining vacant and blighted properties for productive agriculture, this research begins in New Orleans but ultimately informs shrinking cities in disparate regions. When urban vacancy is seen as an opportunity rather than a burden, designers are freed to envision a host of creative responses.
Walkability Through Interior Spheres in Urban Environment

Seyed SaLEH Kalantari Hematabadi, Texas A&M University, United States, skalant@tamu.edu
Alireza Mostaghni, Art University of Tehran, Iran

Keywords: walkability; interior design; urban design; safety; art gallery; bridge-gallery

There is a growing body of evidences supporting the theory that walkability of urban environment is a feature of advanced cities, particularly where public health is concerned. An increasing number of researchers have the same opinion that social networks and community involvement have positive health outcomes. The lack of healthy environment in our urban spheres encourages me to focus on the area of active living. How we can encourage people to do walking in urban areas? How an urban environment can affect public health? What are the items that can affect trend to do walking? What are the attributes of a walk-able pathway? The methodology of this study is the case study through design approach.

The hypothesis in this study indicates that designing indoor sphere in urban texture can encourage people to walk more in cities, especially when safety, people preferences, and stress reduction pathways are concerned. This study is initiated by reviewing the literatures in the area of walkability and its effects on public health. Research by Nasar (1984, 1994, 2006, 2008), Evans (1984, 2005), and Leyden (2003) shape major part of literature review in this study. Afterward, some practical design examples of interior designed urban environment such as Art Street Galleries are investigated. Finally, a Bridge-Galley is designed based on the findings in this study. The design provides a pathway with the function of Art Street Gallery with all interior designed features on a river beside a functional straight pathway working as a bridge. While, the study more focused on the indoor spaces in the urban context, the art gallery pathway is fully designed in detailed, which can encourage people to select non-straight pathway to experience interior safe spaces inside cities. This involvement can result in enhancing the public health. Although, designing walk-able pathway made major challenges for the project, the interior design approach created good opportunities for stating new concepts in urban design. Further research is required to determine which kinds of street functions are capable of supporting higher levels of walkability in cities.
Author Index
Abrams, Robin ........................................... 216
Alarcon, Jorge ........................................... 280
Aliasghari Khabbaz, Parisa ..................... 139
Allen, Austin ........................................... 20
Allen, Tania .............................................. 6
Alomar, Richard ........................................ 287
Appold, Melinda ....................................... 302
Apte-Dalvie, Suvarna ................................. 227
Arnold, Allison ......................................... 258
Artunc, Sadik ........................................... 59
Ashby, Linda ............................................. 248
Ashmun, Sarah ......................................... 202
Atash, Farhad .......................................... 319
Auguste, Reece ......................................... 20
Baier, David ............................................. 42
Barbarash, David .................................... 46, 75
Bardenhagen, Eric .................................... 233
Barton, Christopher .................................. 262
Bassett, Scott ........................................... 270
Bassuk, Nina ............................................. 234
Baumgarten, Matt ..................................... 295
Beach, Tessa ............................................ 92, 299
Beaman, Michael ...................................... 34
Beamish, Anne ......................................... 97
Begly, Scott ............................................. 181
Beidler, Kyle ............................................ 45, 103
Belanger, Blake ........................................ 27, 44
Bennett, Katherine .................................... 332
Bernard, Eric .......................................... 162
Bernasconi, Claudia ................................... 291
Betnar, Bret ............................................. 2
Billig, Noah ............................................. 219, 322
Bischoff, Annaliese ................................... 100
Blackmore, Pamela .................................... 256
Blankenship, Jeffrey ................................. 133
Bohannon, C.L. ........................................ 286
Bolton, Susan .......................................... 280
Bose, Mallika ........................................... 193, 275
Boswell, Jacob ......................................... 343
Boyer, Mark ............................................. 59
Boyle, Douglas ......................................... 270
Brabec, Elizabeth ................................. 173, 190, 194
Brittenum, Judy Byrd .................... 63
Britton, Jennifer ......................................... 39
Brooks, Kenneth ........................................ 50, 59
Brown, Brenda .......................................... 313
Brown, Jim ............................................... 327
Bryant, M. Margaret ............................. 163, 243
Bryant, Margaret ................................. 59, 163, 243
Brzuszek, Robert ..................................... 172
Burcher, Lise ............................................ 76
Burgess, Nathan ....................................... 167
Burke, Katie ............................................. 255
Burkholder, Sean ................................. 181, 225, 321, 323
Bush, Erik ............................................... 225
Bussiere, Simon ....................................... 62, 309
Butler, Peter ............................................ 171
Buys, Laurie ............................................ 303
Calabria, Ashley ....................................... 73
Calabria, Jon .......................................... 285
Calorussko, Christine ............................ 32
Campbell, Angela ..................................... 171
Campbell, Cameron .............................. 5
Canfield, Jessica ....................................... 184, 254
<table>
<thead>
<tr>
<th>Author Name</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cannady, Shelley</td>
<td>128</td>
</tr>
<tr>
<td>Cantrell, Bradley</td>
<td>33</td>
</tr>
<tr>
<td>Cao, Wei</td>
<td>117</td>
</tr>
<tr>
<td>Cardasis, Dean</td>
<td>65, 109</td>
</tr>
<tr>
<td>Carman, Scott</td>
<td>222</td>
</tr>
<tr>
<td>Carrington, Daryl</td>
<td>320</td>
</tr>
<tr>
<td>Carter, Emilie</td>
<td>207</td>
</tr>
<tr>
<td>Castle, Eric</td>
<td>188</td>
</tr>
<tr>
<td>Cengiz, Bülent</td>
<td>139, 144</td>
</tr>
<tr>
<td>Cengiz, Canan</td>
<td>144</td>
</tr>
<tr>
<td>Cerra, Joshua</td>
<td>169</td>
</tr>
<tr>
<td>Çetinkaya Karafaki, Filiz</td>
<td>139</td>
</tr>
<tr>
<td>Chan, Elisabeth Clemence</td>
<td>17</td>
</tr>
<tr>
<td>Chang, Chun-Yen</td>
<td>138, 197, 206, 223, 226, 238, 271, 304</td>
</tr>
<tr>
<td>Chang, Hyejung</td>
<td>145</td>
</tr>
<tr>
<td>Chanse, Victoria</td>
<td>202, 248</td>
</tr>
<tr>
<td>Chapagain, Neel Kamal</td>
<td>120</td>
</tr>
<tr>
<td>Chen, Dan</td>
<td>69</td>
</tr>
<tr>
<td>Cheng, Chingwen</td>
<td>173</td>
</tr>
<tr>
<td>Cheng, Tsung-Pei</td>
<td>305</td>
</tr>
<tr>
<td>Chilton, Elizabeth</td>
<td>190</td>
</tr>
<tr>
<td>Choi, Jane</td>
<td>222</td>
</tr>
<tr>
<td>Chon, Jinhyung</td>
<td>213</td>
</tr>
<tr>
<td>Christensen, Keith</td>
<td>229</td>
</tr>
<tr>
<td>Chu, Jing</td>
<td>171</td>
</tr>
<tr>
<td>Chu, Kung-Hui</td>
<td>83</td>
</tr>
<tr>
<td>Clement, Lorn</td>
<td>132</td>
</tr>
<tr>
<td>Clements, Terry</td>
<td>89, 117, 286</td>
</tr>
<tr>
<td>Clouse, Carey</td>
<td>278, 350</td>
</tr>
<tr>
<td>Coffman, Reid</td>
<td>87</td>
</tr>
<tr>
<td>Cohen, Isaac</td>
<td>112</td>
</tr>
<tr>
<td>Cole, C. Andrew</td>
<td>154</td>
</tr>
<tr>
<td>Cook, Edward</td>
<td>310</td>
</tr>
<tr>
<td>Corkery, Linda</td>
<td>111</td>
</tr>
<tr>
<td>Coskun Hepcan, Cigdem</td>
<td>307</td>
</tr>
<tr>
<td>Cox, Adina</td>
<td>318</td>
</tr>
<tr>
<td>Crawford, Carter</td>
<td>26</td>
</tr>
<tr>
<td>Crawford, Katya</td>
<td>44, 56, 212</td>
</tr>
<tr>
<td>Crawford, Pat</td>
<td>57</td>
</tr>
<tr>
<td>Crewe, Katherine</td>
<td>146</td>
</tr>
<tr>
<td>Cui, Mingyu</td>
<td>336</td>
</tr>
<tr>
<td>Culbertson, Kurt</td>
<td>266</td>
</tr>
<tr>
<td>Cushing, Debra Flanders</td>
<td>242</td>
</tr>
<tr>
<td>Dahl, Bernie</td>
<td>46, 59, 75</td>
</tr>
<tr>
<td>Dalton, Robert</td>
<td>57</td>
</tr>
<tr>
<td>Daniels, Erin</td>
<td>267</td>
</tr>
<tr>
<td>Daniels, Tom</td>
<td>204</td>
</tr>
<tr>
<td>Deeg, Lohren</td>
<td>62</td>
</tr>
<tr>
<td>Deming, M. Elen</td>
<td>47</td>
</tr>
<tr>
<td>Deutsch, Barbara</td>
<td>239, 246</td>
</tr>
<tr>
<td>Di Palo, Mariarosaria</td>
<td>291</td>
</tr>
<tr>
<td>Diaz-Montemayor, Gabriel</td>
<td>334</td>
</tr>
<tr>
<td>Dieterlen, Susan</td>
<td>203, 217</td>
</tr>
<tr>
<td>Douglas, Kim</td>
<td>294</td>
</tr>
<tr>
<td>Dowdy, Diane</td>
<td>220</td>
</tr>
<tr>
<td>Dvorak, Bruce</td>
<td>87, 295, 340</td>
</tr>
<tr>
<td>Edstrom O'Hara, Christine</td>
<td>311</td>
</tr>
<tr>
<td>Egues, Rafael</td>
<td>316</td>
</tr>
<tr>
<td>Eisenman, Theodore</td>
<td>204</td>
</tr>
<tr>
<td>Elabd, Aliaa</td>
<td>122, 216</td>
</tr>
<tr>
<td>Elam, Grey</td>
<td>164</td>
</tr>
<tr>
<td>Ellis, Christopher</td>
<td>207, 257, 260</td>
</tr>
<tr>
<td>Erdman, Kimball</td>
<td>129, 219</td>
</tr>
<tr>
<td>Author</td>
<td>Page</td>
</tr>
<tr>
<td>--------</td>
<td>------</td>
</tr>
<tr>
<td>Ervin, Stephen</td>
<td>33</td>
</tr>
<tr>
<td>Eser, Nihal</td>
<td>307</td>
</tr>
<tr>
<td>Evans, Catherine</td>
<td>111</td>
</tr>
<tr>
<td>Evans, David</td>
<td>266</td>
</tr>
<tr>
<td>Fanger, Stephanie</td>
<td>50</td>
</tr>
<tr>
<td>Farnsworth, Craig</td>
<td>241</td>
</tr>
<tr>
<td>Faruque, Omar</td>
<td>284</td>
</tr>
<tr>
<td>Fleming, William</td>
<td>87</td>
</tr>
<tr>
<td>Fox, Kris</td>
<td>90, 135</td>
</tr>
<tr>
<td>Freitag, Tim</td>
<td>14</td>
</tr>
<tr>
<td>French, Kirk</td>
<td>211</td>
</tr>
<tr>
<td>Frye, Susan</td>
<td>56</td>
</tr>
<tr>
<td>Gali Izard, Teresa</td>
<td>81</td>
</tr>
<tr>
<td>Gallo, Cory</td>
<td>191, 289, 314</td>
</tr>
<tr>
<td>Garner, Christopher</td>
<td>270</td>
</tr>
<tr>
<td>Geffel, Michael</td>
<td>81</td>
</tr>
<tr>
<td>George, Benjamin</td>
<td>51, 99</td>
</tr>
<tr>
<td>Gharipour, Mohammad</td>
<td>317</td>
</tr>
<tr>
<td>Gibson, Huston</td>
<td>184</td>
</tr>
<tr>
<td>Gillem, Mark</td>
<td>187</td>
</tr>
<tr>
<td>Gleason, Kathryn</td>
<td>243, 302</td>
</tr>
<tr>
<td>Godfrey, Anne</td>
<td>70, 136</td>
</tr>
<tr>
<td>Gohar, Amir</td>
<td>308</td>
</tr>
<tr>
<td>Gordy, Matthew</td>
<td>269</td>
</tr>
<tr>
<td>Gorenflo, Larry</td>
<td>275</td>
</tr>
<tr>
<td>Grady, Amy</td>
<td>167</td>
</tr>
<tr>
<td>Graffam, Skip</td>
<td>300</td>
</tr>
<tr>
<td>Graham, Todd</td>
<td>349</td>
</tr>
<tr>
<td>Greco, Michael</td>
<td>349</td>
</tr>
<tr>
<td>Green, William</td>
<td>292</td>
</tr>
<tr>
<td>Griggs, Jennifer</td>
<td>212</td>
</tr>
<tr>
<td>Gunn, Susan Cathleen</td>
<td>20, 130</td>
</tr>
<tr>
<td>Gurucharri, Maria C.</td>
<td>49</td>
</tr>
<tr>
<td>Haenraets, Jan</td>
<td>127</td>
</tr>
<tr>
<td>Hall, Shirley</td>
<td>76</td>
</tr>
<tr>
<td>Hambright-Belue, Sallie</td>
<td>296</td>
</tr>
<tr>
<td>Hametz, Isaac</td>
<td>112</td>
</tr>
<tr>
<td>Handeen, Daniel</td>
<td>188</td>
</tr>
<tr>
<td>Harding, Daniel</td>
<td>276</td>
</tr>
<tr>
<td>Hargrove, Ryan</td>
<td>36</td>
</tr>
<tr>
<td>Harris, Josh</td>
<td>47</td>
</tr>
<tr>
<td>Harrison, Sarah Georgia</td>
<td>116</td>
</tr>
<tr>
<td>Harvey, Brittany</td>
<td>210</td>
</tr>
<tr>
<td>Hashimoto, Jun</td>
<td>321</td>
</tr>
<tr>
<td>Hawks, Richard</td>
<td>59</td>
</tr>
<tr>
<td>Hays, David</td>
<td>101, 140</td>
</tr>
<tr>
<td>Heavers, Nathan</td>
<td>147</td>
</tr>
<tr>
<td>Heavner, Rebecca</td>
<td>8</td>
</tr>
<tr>
<td>Helphand, Kenneth</td>
<td>18</td>
</tr>
<tr>
<td>Henderson, Ron</td>
<td>131</td>
</tr>
<tr>
<td>Hepcan, Serif</td>
<td>307</td>
</tr>
<tr>
<td>Herrmann, Hans</td>
<td>289</td>
</tr>
<tr>
<td>Hewitt, Robert</td>
<td>22, 339</td>
</tr>
<tr>
<td>Heyda, Patty</td>
<td>28</td>
</tr>
<tr>
<td>Hildner, Ann</td>
<td>46, 75</td>
</tr>
<tr>
<td>Hill, David</td>
<td>61, 141</td>
</tr>
<tr>
<td>Hill, Kristina</td>
<td>164, 167, 247</td>
</tr>
<tr>
<td>Hindle, Richard</td>
<td>134, 261</td>
</tr>
<tr>
<td>Hodge, Sheryl</td>
<td>237</td>
</tr>
<tr>
<td>Hoefer, Wolfram</td>
<td>288</td>
</tr>
<tr>
<td>Hoelscher, Deanna</td>
<td>220</td>
</tr>
<tr>
<td>Hoffman-Brandt, Denise</td>
<td>115, 189, 214</td>
</tr>
<tr>
<td>Hohmann, Heidi</td>
<td>143</td>
</tr>
<tr>
<td>Hollingsworth, Melissa</td>
<td>127</td>
</tr>
</tbody>
</table>
Author Index

Hollstein, Leah .............................................. 236
Holmes, Alice .............................................. 80
Holmes, Rob .............................................. 114
Holtan, Meghan ........................................... 217
Holz, Kristofer ............................................. 311
Hong, Zaneta .............................................. 34
Hopman, David ............................................ 87, 218
Horrigan, Paula ........................................... 10
Hosogaki, Ayaka .......................................... 171
Hou, Jeffrey ............................................... 329
Hsing, Man-Chun ........................................... 206
Hsieh, Chung-Heng ........................................ 271
Hu, Jie ....................................................... 176, 306
Huang, Changshan ........................................ 42, 274
Hung, Shih-Han ........................................... 304
Hunt, Jon ................................................... 5
Hwang, Yun Hye ........................................... 185
Jaber, Fouad ............................................... 80
Jackson, Robert ........................................... 180
Jacobus, Frank ............................................ 113
James, Matthew .......................................... 52
Jeran, Claire ............................................... 107
Jerke, Dennis ............................................. 246
Jewell, Linda ............................................... 151
Jiang, Bin .................................................. 201, 271
John-Alder, Kathleen .................................... 142
Johnson, Julie ............................................. 40
Jones Allen, Diane ....................................... 94
Jones, Diane ............................................... 94
Josephine, Neldner ....................................... 240
Kalantari Hematabadi, Seyed SAleh .................. 351
Kambic, Kathleen ......................................... 137
Kambic, Kathy ............................................ 10
Kang, Jian .................................................. 23, 221
Karle, David ............................................... 37
Katen, Brian ............................................... 55, 150
Keane, Tim ................................................ 158, 243, 255
Kelley, Kristian .......................................... 50, 231
Kenny, Natasha .......................................... 76
Kew, Barry ................................................ 91, 290
Kilbane, Simon .......................................... 240
Kim, Hyun Woo ......................................... 298
Kim, Hyung Jin .......................................... 325
Kim, Hyungjin ........................................... 220
Kim, Jinki .................................................. 253
Kim, Jun-Hyun .......................................... 7, 78, 200, 233
Kim, Mintai ............................................... 55
Kim, Myung Hee ......................................... 83
Kim, Seung-hwan ....................................... 282
Kim, Young-Jae .......................................... 78
King, Michael ............................................ 101, 140
Kingery-Page, Katie ..................................... 132
Knuvener, Thomas ....................................... 42
Koepke, John ............................................. 43
Kohler, Martin ........................................... 182
Koliij, Hooman .......................................... 277, 317
Komara, Ann ............................................ 119
Kondolf, Mathias ......................................... 308
Koo, Jayoung ............................................. 265
Koo, Tae Seo ............................................. 29
Korostoff, Neil .......................................... 345
Kroger, Robert .......................................... 314
Kullmann, Karl .......................................... 346
Kweon, Byoung-Suk ................................... 248, 260, 263, 336
<table>
<thead>
<tr>
<th>Author Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lackey, Gordon ........................................ 172, 268</td>
</tr>
<tr>
<td>Lamba, Baldev ............................................ 300</td>
</tr>
<tr>
<td>Lange, Eckart ............................................. 23, 221</td>
</tr>
<tr>
<td>Langford, Dustin .......................................... 232</td>
</tr>
<tr>
<td>Langhorst, Joern .......................................... 10, 20, 335</td>
</tr>
<tr>
<td>LaTomme, Amy ................................................ 208</td>
</tr>
<tr>
<td>Lavoie, Caroline ........................................... 10</td>
</tr>
<tr>
<td>Lawrence, Bryce ............................................. 157</td>
</tr>
<tr>
<td>LeBleu, Charlene ........................................... 82, 156, 159, 196, 316</td>
</tr>
<tr>
<td>Ledder, Brian ................................................. 320</td>
</tr>
<tr>
<td>Lee, Brian ..................................................... 251, 262</td>
</tr>
<tr>
<td>Lee, Chanam ................................................ 200, 215, 220, 233, 245, 325</td>
</tr>
<tr>
<td>Lee, Hye Kyung ............................................. 298</td>
</tr>
<tr>
<td>Lee, Joomee .................................................. 340</td>
</tr>
<tr>
<td>Lee, Jung A ................................................... 213</td>
</tr>
<tr>
<td>Lee, Sang Yun ................................................ 263</td>
</tr>
<tr>
<td>Lee, Sungkyung ............................................. 192, 282</td>
</tr>
<tr>
<td>Lee, Woosung ................................................ 220</td>
</tr>
<tr>
<td>Lee, Yumi ....................................................... 174</td>
</tr>
<tr>
<td>Lehrman, Barry .............................................. 30, 247</td>
</tr>
<tr>
<td>Li, Chuo .......................................................... 180</td>
</tr>
<tr>
<td>Li, Dongying ................................................ 209, 271</td>
</tr>
<tr>
<td>Li, Ming-Han ................................................. 78, 83, 244, 247, 257, 295, 298, 305</td>
</tr>
<tr>
<td>Li, Pengzhi ..................................................... 340</td>
</tr>
<tr>
<td>Li, Shujuan ..................................................... 3</td>
</tr>
<tr>
<td>Li, Wenjie ...................................................... 166</td>
</tr>
<tr>
<td>Liao, Chien-Fu ............................................... 226</td>
</tr>
<tr>
<td>Liao, Kuei-Hsien .......................................... 126</td>
</tr>
<tr>
<td>Lickwar, Phoebe ........................................... 44, 67, 113</td>
</tr>
<tr>
<td>Licon, Carlos .................................................. 177</td>
</tr>
<tr>
<td>Lien, Barbara .................................................. 341</td>
</tr>
<tr>
<td>Lin, Yao ......................................................... 328</td>
</tr>
<tr>
<td>Lin, Ying-Hsuan ............................................ 238</td>
</tr>
<tr>
<td>Lin, Ying-Ju .................................................. 197</td>
</tr>
<tr>
<td>Lin, Yi-Ting .................................................. 138</td>
</tr>
<tr>
<td>Lindquist, Mark ........................................... 23, 221</td>
</tr>
<tr>
<td>Liu, Xianpeng ............................................... 340</td>
</tr>
<tr>
<td>Livingston, Margaret ................................... 337</td>
</tr>
<tr>
<td>Lloyd, Katherine .......................................... 11</td>
</tr>
<tr>
<td>Lowery, Bryce ............................................... 205</td>
</tr>
<tr>
<td>Luo, Yi ........................................................... 244, 295</td>
</tr>
<tr>
<td>MacDonald, Eric ......................................... 168, 281</td>
</tr>
<tr>
<td>Malmkvist, Sara .......................................... 115</td>
</tr>
<tr>
<td>Manandhar, Nhasala .................................. 165</td>
</tr>
<tr>
<td>Mang, Hong .................................................. 88</td>
</tr>
<tr>
<td>Marin, Amy .................................................... 263</td>
</tr>
<tr>
<td>Marlow, Christopher .................................. 13</td>
</tr>
<tr>
<td>Martin, Michael .......................................... 148</td>
</tr>
<tr>
<td>Matkovszki, Ilona .................................. 47</td>
</tr>
<tr>
<td>Matthews, Paul ......................................... 285</td>
</tr>
<tr>
<td>Maziar, Memar ........................................... 125</td>
</tr>
<tr>
<td>McCown, Ken ............................................... 48</td>
</tr>
<tr>
<td>McCreary, Matthew ..................................... 312</td>
</tr>
<tr>
<td>McDowell, Christopher .................................. 86</td>
</tr>
<tr>
<td>McGinn, Gwendolyn ................................... 164</td>
</tr>
<tr>
<td>McSherry, Laurel ........................................ 95</td>
</tr>
<tr>
<td>Mei, Cuiyan .................................................. 218</td>
</tr>
<tr>
<td>Melbourne, Scott .................................. 85</td>
</tr>
<tr>
<td>Melcher, Katherine .................................. 54, 86, 279</td>
</tr>
<tr>
<td>Merrill, Jeremy ............................................ 237</td>
</tr>
<tr>
<td>Michael, Judd ............................................... 266</td>
</tr>
<tr>
<td>Michael, Sean ............................................. 59, 266</td>
</tr>
<tr>
<td>Mihalko, Cheryl ............................................ 71</td>
</tr>
<tr>
<td>Author Name</td>
</tr>
<tr>
<td>-----------------------------</td>
</tr>
<tr>
<td>Milburn, Lee-Anne</td>
</tr>
<tr>
<td>Miller, Kristine</td>
</tr>
<tr>
<td>Miller, Patrick</td>
</tr>
<tr>
<td>Milligan, Brett</td>
</tr>
<tr>
<td>Miniutti, Peter</td>
</tr>
<tr>
<td>Mitchell, Deb</td>
</tr>
<tr>
<td>Moffson, Steven</td>
</tr>
<tr>
<td>Mogen, Elizabeth</td>
</tr>
<tr>
<td>Mohai, Paul</td>
</tr>
<tr>
<td>Mooney, Patrick</td>
</tr>
<tr>
<td>Moore, Robin</td>
</tr>
<tr>
<td>Morrison, Julia</td>
</tr>
<tr>
<td>Morrison, Ryan</td>
</tr>
<tr>
<td>Mostaghni, Alireza</td>
</tr>
<tr>
<td>Murtha, Timothy</td>
</tr>
<tr>
<td>Myers, David</td>
</tr>
<tr>
<td>Myers, Mary</td>
</tr>
<tr>
<td>Nadenicek, Daniel</td>
</tr>
<tr>
<td>Nassar, Hala</td>
</tr>
<tr>
<td>Ndubisi, Forster</td>
</tr>
<tr>
<td>Nelson, Holly Grace</td>
</tr>
<tr>
<td>Nelson, Nicholas</td>
</tr>
<tr>
<td>Newman, Galen</td>
</tr>
<tr>
<td>Niazi, Zoha</td>
</tr>
<tr>
<td>Nicolson, Craig</td>
</tr>
<tr>
<td>Nonaka, Natsumi</td>
</tr>
<tr>
<td>Oliver, Molly</td>
</tr>
<tr>
<td>Ono, Akiko</td>
</tr>
<tr>
<td>Orland, Brian</td>
</tr>
<tr>
<td>Ory, Marcia</td>
</tr>
<tr>
<td>Osborn, Brian</td>
</tr>
<tr>
<td>Osler, Peter</td>
</tr>
<tr>
<td>Ou, Sheng-Jung</td>
</tr>
<tr>
<td>Overbey, Emily</td>
</tr>
<tr>
<td>Ozdil, Taner</td>
</tr>
<tr>
<td>Ozgun, Kaan</td>
</tr>
<tr>
<td>Padgett, Sara</td>
</tr>
<tr>
<td>Padua, Mary</td>
</tr>
<tr>
<td>Palmer, Joni M</td>
</tr>
<tr>
<td>Panton, Lauren</td>
</tr>
<tr>
<td>Pardue, Douglas</td>
</tr>
<tr>
<td>Patrick, Brooks</td>
</tr>
<tr>
<td>Payne Tofte, Elizabeth</td>
</tr>
<tr>
<td>Perkl, Ryan</td>
</tr>
<tr>
<td>Perron, P. Richard</td>
</tr>
<tr>
<td>Persstlinger, Jenna</td>
</tr>
<tr>
<td>Petersenn, Ture</td>
</tr>
<tr>
<td>Petschek, Peter</td>
</tr>
<tr>
<td>Phillips, Claudia Goetz</td>
</tr>
<tr>
<td>Phillips, Jack</td>
</tr>
<tr>
<td>Pieranunzi, Danielle</td>
</tr>
<tr>
<td>Pitt, David</td>
</tr>
<tr>
<td>Pond, Ellen</td>
</tr>
<tr>
<td>Potteiger, Matthew</td>
</tr>
<tr>
<td>Powers, Matthew</td>
</tr>
<tr>
<td>Pradhananga, Anjana</td>
</tr>
<tr>
<td>Queen, Sara</td>
</tr>
<tr>
<td>Radke, John</td>
</tr>
<tr>
<td>Rajora, Neha</td>
</tr>
<tr>
<td>Reaves, Anna</td>
</tr>
<tr>
<td>Reese, Sarah</td>
</tr>
<tr>
<td>Ren, Lanbin</td>
</tr>
<tr>
<td>Rice, Arthur</td>
</tr>
<tr>
<td>Richards, James</td>
</tr>
<tr>
<td>Author Index</td>
</tr>
<tr>
<td>--------------</td>
</tr>
<tr>
<td>Richardson, Zachary .................................. 168, 281</td>
</tr>
<tr>
<td>Richley, Kenneth ........................................ 177</td>
</tr>
<tr>
<td>Ritchey, Claire .......................................... 156</td>
</tr>
<tr>
<td>Rogers, Carl ............................................... 5</td>
</tr>
<tr>
<td>Rolley, Stephanie ......................................... 53, 237</td>
</tr>
<tr>
<td>Rosenblatt-Naderi, Jody .................................. 208, 210</td>
</tr>
<tr>
<td>Rotar, Sean ................................................ 46, 75</td>
</tr>
<tr>
<td>Rottle, Nancy .............................................. 338</td>
</tr>
<tr>
<td>Russell, Paul .............................................. 11, 14, 276</td>
</tr>
<tr>
<td>Ryan, Robert ............................................... 173</td>
</tr>
<tr>
<td>Saginor, Jesse ............................................ 245</td>
</tr>
<tr>
<td>Salter, Mikey ............................................... 168</td>
</tr>
<tr>
<td>Samples, Samantha ....................................... 310</td>
</tr>
<tr>
<td>Sanoff, Henry ............................................. 122</td>
</tr>
<tr>
<td>Sass, Christopher ........................................ 157, 158</td>
</tr>
<tr>
<td>Sattler, Meredith ......................................... 108</td>
</tr>
<tr>
<td>Schad, Madeline .......................................... 41</td>
</tr>
<tr>
<td>Schauwecker, Timothy .................................... 172, 268</td>
</tr>
<tr>
<td>Schlepp, Nichole .......................................... 43</td>
</tr>
<tr>
<td>Schörgendorfer, Angela .................................. 251</td>
</tr>
<tr>
<td>Schroth, Olaf ............................................... 4, 15</td>
</tr>
<tr>
<td>Schultz, Meghan ......................................... 191</td>
</tr>
<tr>
<td>Schurch, Thomas .......................................... 98, 330</td>
</tr>
<tr>
<td>Schwann, Alyssa .......................................... 127</td>
</tr>
<tr>
<td>Seavitt Nordenson, Catherine .......................... 104, 160</td>
</tr>
<tr>
<td>Segura, Carolina ......................................... 36</td>
</tr>
<tr>
<td>Shakya, Pratisha .......................................... 82</td>
</tr>
<tr>
<td>Sharma, Archana .......................................... 327</td>
</tr>
<tr>
<td>Shearer, Allan ............................................ 31, 236</td>
</tr>
<tr>
<td>Sheppard, Stephen ........................................ 4, 15</td>
</tr>
<tr>
<td>Shi, Ao ....................................................... 340</td>
</tr>
<tr>
<td>Siero, Gerard ............................................... 240</td>
</tr>
<tr>
<td>Sieweke, Jorg ............................................... 112</td>
</tr>
<tr>
<td>Silva, Kapila ............................................... 120</td>
</tr>
<tr>
<td>Sim, Jeannie ................................................ 105</td>
</tr>
<tr>
<td>Simmons, Mark ............................................ 239</td>
</tr>
<tr>
<td>Simon, Alf ................................................... 348</td>
</tr>
<tr>
<td>Singh, Virajita ............................................. 188</td>
</tr>
<tr>
<td>Sinha, Amita ................................................ 120</td>
</tr>
<tr>
<td>Skabelund, Lee ............................................ 264</td>
</tr>
<tr>
<td>Slater, Jeffrey ............................................. 312</td>
</tr>
<tr>
<td>Sleeegers, Frank ......................................... 182, 194</td>
</tr>
<tr>
<td>Sleipness, Ole ............................................. 58</td>
</tr>
<tr>
<td>Sloane, David .............................................. 205</td>
</tr>
<tr>
<td>Smith, Carl .................................................. 44</td>
</tr>
<tr>
<td>Smith, Lindsay ............................................. 132</td>
</tr>
<tr>
<td>Speetjens, Kenneth (Dale) ............................. 196</td>
</tr>
<tr>
<td>Spencer, Benjamin ....................................... 252, 280</td>
</tr>
<tr>
<td>Spirn, Anne Whiston ..................................... 259</td>
</tr>
<tr>
<td>Stankewich, Shawn ..................................... 313</td>
</tr>
<tr>
<td>Stepner, Michael ......................................... 330</td>
</tr>
<tr>
<td>Stevens, Julie ............................................... 195</td>
</tr>
<tr>
<td>Stevens, Rachel .......................................... 167</td>
</tr>
<tr>
<td>Stewart, Emma ............................................ 230</td>
</tr>
<tr>
<td>Stilgenbauer, Judith ..................................... 183</td>
</tr>
<tr>
<td>Storie, Mark ............................................... 260</td>
</tr>
<tr>
<td>Straub, Dietmar .......................................... 344</td>
</tr>
<tr>
<td>Strohbach, Michael ..................................... 173</td>
</tr>
<tr>
<td>Sullivan, Chip ............................................ 10</td>
</tr>
<tr>
<td>Sullivan, Jack ............................................ 202</td>
</tr>
<tr>
<td>Sullivan, William C .................................... 186, 201, 271</td>
</tr>
<tr>
<td>Sung, Chan Yong ......................................... 83</td>
</tr>
<tr>
<td>Suppakitpaisarn, Pongsakorn ......................... 192</td>
</tr>
<tr>
<td>Swaffield, Simon ........................................ 230</td>
</tr>
</tbody>
</table>

**Author Index**

<p>| Austin, Texas |March 27 – 30, 2013 | CELA 2013 Conference Abstract | S360 |</p>
<table>
<thead>
<tr>
<th>Author</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swapp, Mark</td>
<td>83</td>
</tr>
<tr>
<td>Tang, Dorothy</td>
<td>102, 198</td>
</tr>
<tr>
<td>Tang, Rennie</td>
<td>121</td>
</tr>
<tr>
<td>Tavares, Silvia</td>
<td>230</td>
</tr>
<tr>
<td>Taylor, Geoff</td>
<td>339</td>
</tr>
<tr>
<td>Taylor, Geofery</td>
<td>22</td>
</tr>
<tr>
<td>Taylor, Pat</td>
<td>175, 257, 328</td>
</tr>
<tr>
<td>Tebyanian, Nastaran</td>
<td>125</td>
</tr>
<tr>
<td>Thomas Karle, Sarah</td>
<td>37, 64</td>
</tr>
<tr>
<td>Thompson, Elizabeth</td>
<td>65</td>
</tr>
<tr>
<td>Thoren, Roxi</td>
<td>38</td>
</tr>
<tr>
<td>Toland, Tim</td>
<td>301</td>
</tr>
<tr>
<td>Torres-Bustamante, Cesar</td>
<td>21</td>
</tr>
<tr>
<td>Trafton, Liza</td>
<td>115</td>
</tr>
<tr>
<td>Trowbridge, Peter</td>
<td>234</td>
</tr>
<tr>
<td>Tucker, Matthew</td>
<td>43</td>
</tr>
<tr>
<td>Tung, Chih-Fan</td>
<td>223</td>
</tr>
<tr>
<td>Valderrama, Ana</td>
<td>120</td>
</tr>
<tr>
<td>Vanucci, Jamie</td>
<td>35</td>
</tr>
<tr>
<td>Vassar, Rachel</td>
<td>112</td>
</tr>
<tr>
<td>Verma, Amitabh</td>
<td>333</td>
</tr>
<tr>
<td>Vick, Alfie</td>
<td>285</td>
</tr>
<tr>
<td>Volkman, Nancy</td>
<td>149</td>
</tr>
<tr>
<td>Waite, Phil</td>
<td>58</td>
</tr>
<tr>
<td>Walker, Jason</td>
<td>268</td>
</tr>
<tr>
<td>Wang, Peiwen</td>
<td>162</td>
</tr>
<tr>
<td>Warren, Paige</td>
<td>173</td>
</tr>
<tr>
<td>Wasserman, Judith</td>
<td>84, 110</td>
</tr>
<tr>
<td>Watkins, Nicholas</td>
<td>202</td>
</tr>
<tr>
<td>Watts, David</td>
<td>199</td>
</tr>
<tr>
<td>Weaver, Catherine</td>
<td>292</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Author</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weesner, John Paul</td>
<td>49</td>
</tr>
<tr>
<td>Weir, Ian</td>
<td>303</td>
</tr>
<tr>
<td>Weller, Richard</td>
<td>240</td>
</tr>
<tr>
<td>Westort, Caroline</td>
<td>5, 33</td>
</tr>
<tr>
<td>Wilder, Shannon</td>
<td>285</td>
</tr>
<tr>
<td>Wilson Baptist, Karen</td>
<td>72</td>
</tr>
<tr>
<td>Wilson, Barbara Brown</td>
<td>283</td>
</tr>
<tr>
<td>Wilson, Corey</td>
<td>251, 262</td>
</tr>
<tr>
<td>Winslow, Jane Futrell</td>
<td>283</td>
</tr>
<tr>
<td>Wittner, Kathryn</td>
<td>107</td>
</tr>
<tr>
<td>Won, Jae Woong</td>
<td>215</td>
</tr>
<tr>
<td>Xu, Minjie</td>
<td>245</td>
</tr>
<tr>
<td>Yan, Jie</td>
<td>3</td>
</tr>
<tr>
<td>Yang, Bo</td>
<td>3, 246, 248, 254, 256</td>
</tr>
<tr>
<td>Yang, Chen</td>
<td>105</td>
</tr>
<tr>
<td>Yates, Natalie</td>
<td>28</td>
</tr>
<tr>
<td>Yazgan, Murat Ertugrul</td>
<td>144</td>
</tr>
<tr>
<td>Yocom, Ken</td>
<td>40, 126, 252</td>
</tr>
<tr>
<td>Yoon, Jeongjae</td>
<td>200</td>
</tr>
<tr>
<td>Yoon, Sungyung</td>
<td>282</td>
</tr>
<tr>
<td>Yost, Bambi</td>
<td>5</td>
</tr>
<tr>
<td>Zamani, Zahra</td>
<td>224, 228</td>
</tr>
<tr>
<td>Zhang, Bo</td>
<td>69, 118</td>
</tr>
<tr>
<td>Zhang, Jingjing</td>
<td>250</td>
</tr>
<tr>
<td>Zhang, Qian</td>
<td>250</td>
</tr>
<tr>
<td>Zhang, Yue</td>
<td>246, 256</td>
</tr>
<tr>
<td>Zhao, Xiaolong</td>
<td>69, 118</td>
</tr>
<tr>
<td>Zhong, Sinan</td>
<td>340</td>
</tr>
<tr>
<td>Zhou, Xiaolu</td>
<td>209, 253</td>
</tr>
<tr>
<td>Zimbovsky, Shimon</td>
<td>186, 241</td>
</tr>
</tbody>
</table>
CONFERENCE HOST
The University of Texas at Austin School of Architecture

CONFERENCE SPONSORS

EVENT SPONSOR
Landscape Forms

KEYNOTE LECTURE SPONSORS
Fellows of the Council of Educators in Landscape Architecture
The University of Texas at Austin School of Architecture

SPONSORS
Akademie fur Internationale Bildung
Hunter Industries
Island Press
Routledge/Taylor & Francis Group
University of Texas Press