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Education

2003	Ph.D.	Atmospheric Sciences	University of Washington
2000	M.S.	Atmospheric Sciences	University of Washington
1994	B.A.	Environmental Sciences	University of Virginia

Professional Experience

Fall 2013-present	Professor, Texas A&M University, College Station TX
Fall 2009-Summer 2013	Associate Professor, Texas A&M University, College Station TX
Fall 2003-Summer 2009	Assistant Professor, Texas A&M University, College Station TX

Awards and Fellowships

2016-8	Texas A&M University E.D. Brocket Professorship in Geosciences
2015	AMS Editor's Award for <i>Journal of Climate</i>
2014	AMS Clarence Leroy Meisinger Award
2012	AGU Editors' Citation for Excellence in Refereeing for <i>Eos</i>
2011	Texas A&M Association of Former Students Distinguished Teaching Award
2009	Special Recognition by Texas A&M Women Former Students' Network
2008	College of Geosciences Dean's Distinguished Faculty Teaching Award
2007	College of Geosciences Robert C. Runnels Excellence in Advising Award
2007	Texas A&M University Fish Camp Namesake
2006	NASA New Investigator Program Award
2005	NSF CAREER Award
2004	NASA Goddard Space Flight Center (GSFC) Summer Faculty Fellowship
2001-3	NASA Earth System Science Graduate Fellowship

Field Program Experience

2014-15	DOE Green Ocean Amazon (GoAmazon2014/5), Manaus, Brazil [<i>steering committee member</i>]
2011-12	NSF DYNAMO/JAMSTEC CINDY2011/DOE AMIE, Addu Atoll, Maldives [<i>steering committee member</i>]
2006	DOE Tropical Warm Pool-International Cloud Experiment (TWP-ICE), Darwin, Australia
1999	NASA Kwajalein Experiment (KWAJEX), Marshall Islands
1997	NOAA Tropical Eastern Pacific Process Study (TEPPS), 8N, 125W

Professional Memberships

2009-present	National Weather Association
2002-present	American Geophysical Union
2001-present	American Meteorological Society

Publications (* indicates student that I have advised)

- [50] Ahmed, F.*, and **C. Schumacher**, 2017: Spectral signatures of moisture-convection instability in the Indian Ocean. *J. Atmos. Sci.*, submitted.
- [49] Giangrande, S. E., Z. Feng, M. P. Jensen, J. Comstock, K. L. Johnson, T. Toto, M. Wang, C. Burleyson, F. Mei, L. Machado, A. Manzi, S. Xie, S. Tang, M. A. F. Silva Dias, R. A. F., de Souza, **C. Schumacher** and S. T. Martin, 2017: Cloud Characteristics, Thermodynamic Controls and Radiative Impacts During The Observations and Modeling of the Green Ocean Amazon (GoAmazon2014/5) Experiment. *Atmos. Chem. Phys.*, submitted.
- [48] Stan, C., D. M. Straus, J. S. Frederiksen, H. Lin, E. D. Maloney, and **C. Schumacher**, 2017: Review of tropical-extratropical teleconnections on intraseasonal time scales. *Rev. Geophys.*, submitted.
- [47] Ahmed, F.*, and **C. Schumacher**, 2017: Geographical differences in the tropical precipitation-moisture relationship and rain intensity onset. *Geophys. Res. Lett.*, **44**, 1114-1122, doi:10.1002/2016GL071980.
- [46] Martin, S., P. Artaxo, L. Machado, A. Manzi, R. Souza, **C. Schumacher**, J. Wang, J. Brito, K. Jardine, A. Medeiros, S. de Sa, T. Biscaro, A. Calheiros, B. Portela, and 44 other authors in alphabetical order, 2017: The Green Ocean Amazon Experiment (GoAmazon2014/5) observes pollution affecting gases, aerosols, clouds, and rainfall over the rain forest. *Bull. Amer. Meteor. Soc.*, doi:10.1175/BAMS-D-15-00221.1.
- [45] Giangrande, S. E., T. Toto, M. P. Jensen, M. J. Bartholomew, Z. Feng, A. Protat, C. R. Williams, **C. Schumacher**, and L. Machado, 2016: Convective cloud vertical velocity and mass-flux characteristics from radar wind profiler observations during GoAmazon2014/5. *J. Geophys. Res.*, **121**, 12,891–12,913, doi:10.1002/2016JD025303.
- [44] Fuentes, J. D., M. Chamecki, R. M. Nascimento dos Santos, C. von Randow, P. Stoy, G. Katul, D. R. Fitzjarrald, A. O. Manzi, T. Gerken, A. Trowbridge, L. S. Freire, J. Ruiz-Plancarte, J. M. F. Maia, J. Tota, N. L. Dias, G. Fisch, **C. Schumacher**, O. Acevedo, and J. R. Mercer, 2016: Linking meteorology, turbulence, and air chemistry in the Amazon rainforest during the GoAmazon project. *Bull. Amer. Meteor. Soc.*, doi:10.1175/BAMSD-15-00152.1.
- [43] Ahmed, F.*, **C. Schumacher**, Z. Feng, and S. Hagos, 2016: A retrieval of tropical heating using the 3D structure of precipitation features. *J. Appl. Meteor. Clim.*, **55**, 1965-1982, doi:10.1175/JAMC-D-15-0038.1.
- [42] Aggarwal, P., U. Romatschke, L. Araguas-Araguas, D. Belachew, F. Longstaffe, P. Berg, **C. Schumacher**, and A. Funk*, 2016: Water isotope ratios reveal the proportions of convective and stratiform precipitation. *Nature Geoscience*, **9**, 624-629, doi:10.1038/ngeo2739.
- [41] Liu, P., Q. Zhang, C. Zhang, Y. Zhu, M. Khairoutdinov, H. Kim, **C. Schumacher**, and M. Zhang, 2016: A revised real-time multivariate MJO index. *Mon. Wea. Rev.*, **144**, 627-642, doi:10.1175/MWR-D-15-0237.1.
- [40] Martin, S. T., P. Artaxo, L. A. T. Machado, A. O. Manzi, R. A. F. Souza, **C. Schumacher**, J. Wang, M. O. Andreae, H. M. J. Barbosa, J. Fan, G. Fisch, A. H. Goldstein, A. Guenther, J. L. Jimenez, U. Poschl, M. A. Silva Dias, J. N. Smith, and M. Wendisch, 2016: Introduction: Observations and modeling of the Green Ocean Amazon (GoAmazon2014/5). *Atmos. Chem. Phys.*, **16**, 4785-4797, doi:10.519/acp-16-4785-2016.
- [39] Gerken, T., D. Wei, R. J. Chase, J. D. Fuentes, **C. Schumacher**, L. A. T. Machado, R. V. Andreoli, M. Chamecki, R. A. Ferreira de Souza, L. S. Freire, A. B. Jardine, A. O. Manzi, R. M. Nascimento dos Santos, C. von Randow, P. dos Santos Costa, P. C. Stoy, J. Tota, and A. M. Trowbridge, 2016:

- Downward transport of ozone rich air and implications for atmospheric chemistry in the Amazon rainforest. *Atmospheric Environment*, **124**, 64-76, doi:10.1016/j.atmosenv.2015.11.014.
- [38] Tang, S., S. Xie, Y. Zhang, M. Zhang, **C. Schumacher**, H. Upton*, M. Jensen, K. Johnson, M. Wang, M. Ahlgrimm, Z. Feng, P. Minnis, and M. Thieman, 2016: Large-Scale vertical velocity, diabatic heating and drying profiles associated with seasonal and diurnal variations of convective systems observed in the GoAmazon2014/5 experiment. *Atmos. Chem. Phys*, **16**, 14249-14264, doi:10.5194/acp-16-14249-2016.
- [37] Ahmed, F.*, and **C. Schumacher**, 2015: Convective and stratiform components of the precipitation-moisture relationship. *Geophys. Res. Lett.*, **42**, 10,453–10,462, doi:10.1002/2015GL066957.
- [36] **Schumacher, C.**, S. N. Stevenson*, and C. R. Williams, 2015: Vertical motions of the tropical convective cloud spectrum over Darwin, Australia. *Quart. J. Roy. Meteor. Soc.*, **141**, 4126-4147, doi:10.1002/qj.2520.
- [35] Xu, W., S. A. Rutledge, **C. Schumacher**, and M. Katsumata, 2015: Properties and spatial variability of MJO convection observed by C-band radars in DYNAMO. *J. Atmos. Sci.*, **72**, 4126-4147, doi:10.1175/JAS-D-15-0032.1.
- [34] DePasquale, A. M.*, **C. Schumacher**, and A. Rapp: Radar observations of MJO and Kelvin wave interactions during DYNAMO/CINDY2011/AMIE, 2014. *J. Geophys. Res. –Atmos*, **119**, 6347-6367, doi:10.1002/2013JD021031.
- [33] Homeyer, C. R.*, **C. Schumacher**, and L. J. Hopper*, 2014: Assessing the applicability of the tropical convective-stratiform paradigm in the extratropics using radar divergence profiles. *J. Climate*, **27**, 6673-6686.
- [32] Feng, Z., S. A. McFarlane, **C. Schumacher**, S. Ellis, J. Comstock, and N. Bharadwaj, 2014: Constructing a merged cloud-precipitation radar dataset for tropical convective clouds during the DYNAMO/AMIE experiment at Addu Atoll. *J. Atmos. Ocean Tech*, **31**, 1021-1042.
- [31] Lappen, C., and **C. Schumacher**, 2014: The role of tilted heating in the evolution of the MJO. *J. Geophys. Res. –Atmos.*, **119**, 2966-2989.
- [30] Hopper, L. J.*, **C. Schumacher**, and J. P. Stachnik*, 2013: Implementation and assessment of undergraduate experiences in SOAP: An atmospheric science research and education program. *J. Geoscience Education*, **61**, 415-427.
- [29] Stachnik, J. P. *, **C. Schumacher**, and P. E. Ciesielski, 2013: Total heating characteristics of the ISCCP tropical and subtropical cloud regimes. *J. Climate*, **26**, 7097-7116.
- [28] Funk, A.*, **C. Schumacher**, and J. Awaka, 2013: Analysis of rain classifications over the tropics by Version 7 of the TRMM PR 2A23 algorithm. *J. Met. Soc. Japan*, **91**, 257-272.
- [27] Li, W.*, **C. Schumacher**, and S. A. McFarlane, 2013: Radiative heating of the ISCCP upper level cloud regimes and its impacts on the large-scale tropical circulation. *J. Geophys. Res. –Atmos.*, **118**, 592-604.
- [26] Lappen, C., and **C. Schumacher**, 2012: Heating in the tropical atmosphere: What level of detail is critical for accurate MJO simulations in GCMs? *Clim. Dyn.*, **39**, 2547-2568.
- [25] Martin, E. R.*, and **C. Schumacher**, 2012: The relationship between tropical warm pool precipitation, sea surface temperature, and large-scale vertical motion in IPCC AR4 models. *J. Atmos. Sci.*, **69**, 185-194.
- [24] Hopper, L. J.*, and **C. Schumacher**, 2012: Modeled and observed variations in storm divergence and stratiform rain production in southeast Texas. *J. Atmos. Sci.*, **69**, 1159-1181.
- [23] Seroka, G. N.*, R. E. Orville, and **C. Schumacher**, 2012: Radar nowcasting of total lightning over the Kennedy Space Center. *Wea. and Forecasting*, **27**, 189-204.

- [22] Lin, Y., and coauthors, 2012: TWP-ICE global atmospheric model intercomparison: Convection responsiveness and resolution impact. *J. Geophys. Res.*, **117**, D09111, doi:10.1029/2011JD017018.
- [21] Fridlind, A. M., and coauthors, 2012: A comparison of TWP-ICE observational data with cloud-resolving model results. *J. Geophys. Res.*, **117**, D05204, doi:10.1029/2011JD016595.
- [20] Feng, Z., X. Dong, B. Xi, **C. Schumacher**, P. Minnis, and M. Khaiyer, 2011: TOA radiation budget of convective core/stratiform rain and anvil clouds from deep convective systems. *J. Geophys. Res.*, **116**, D23202, doi:10.1029/2011JD016451.
- [19] Stachnik, J. P. *, and **C. Schumacher**, 2011: A comparison of the Hadley Circulation in modern reanalyses. *J. Geophys. Res.*, **116**, D22102, doi: 10.1029/2011JD016677.
- [18] Martin, E. R. *, and **C. Schumacher**, 2011: The Caribbean low-level jet and its relationship to precipitation in IPCC AR4 models. *J. Climate*, **24**, 5935-5950.
- [17] Li, W. *, and **C. Schumacher**, 2011: Tropical thick anvil viewed by the TRMM Precipitation Radar. *J. Climate*, **24**, 1718-1735.
- [16] Mosier, R. M. *, **C. Schumacher**, R. E. Orville, L. D. Carey, 2011: Radar nowcasting of cloud-to-ground lightning over Houston, Texas. *Wea. and Forecasting*, **26**, 199-212.
- [15] Martin, E. R. *, and **C. Schumacher**, 2011: Modulation of Caribbean precipitation by the Madden-Julian Oscillation. *J. Climate*, **24**, 813-824.
- [14] Mullendore, G. L., A. J. Homann, K. Frederick, and **C. Schumacher**, 2009: Radar reflectivity as a proxy for convective mass transport. *J. Geophys. Res.*, **114**, D16103, doi:10.1029/2008JD011431.
- [13] Casey, S. P. F. *, A. E. Dessler, **C. Schumacher**, 2009: Five-year climatology of midtropospheric dry air layers in warm tropical ocean regions as viewed by AIRS/Aqua. *J. Appl. Meteor. Clim.*, **48**, 1831-1842.
- [12] Hopper, L. J. *, and **C. Schumacher**, 2009: Baroclinicity influences on storm divergence and stratiform rain: Subtropical upper-level disturbances. *Mon. Wea. Rev.*, **137**, 1338-1357.
- [11] **Schumacher, C.**, P. E. Ciesielski, and M. H. Zhang, 2008: Tropical cloud heating profiles: Analysis from KWAJEX. *Mon. Wea. Rev.*, **136**, 4289-4300.
- [10] Jakob, C., and **C. Schumacher**, 2008: Precipitation and latent heating characteristics of the major tropical western Pacific cloud regimes. *J. Climate*, **21**, 4348-4364.
- [9] Frederick, K. *, and **C. Schumacher**, 2008: Anvil characteristics as seen by C-POL during the Tropical Warm Pool International Cloud Experiment (TWP-ICE). *Mon. Wea. Rev.*, **136**, 206-222.
- [8] Casey, S. *, A. Dessler, and **C. Schumacher**, 2007: The frequency of tropical precipitating clouds as observed by the TRMM PR and ICESat/GLAS. *J. Geophys. Res.*, **112**, D14215, doi:10.1029/2007JD008468.
- [7] **Schumacher, C.**, M. H. Zhang, and P. E. Ciesielski, 2007: Heating structures of the TRMM field campaigns. *J. Atmos. Sci.*, **64**, 2593-2610.
- [6] **Schumacher, C.**, and R. A. Houze, Jr., 2006: Stratiform precipitation production over sub-Saharan Africa and the tropical East Atlantic as observed by TRMM. *Quart. J. Roy. Meteor. Soc.*, **132**, 2235-2255.
- [5] Houze, R. A., Jr., S. Brodzik, **C. Schumacher**, S. E. Yuter, and C. R. Williams, 2004: Uncertainties in oceanic radar rain maps at Kwajalein and implications for satellite validation. *J. Appl. Meteor.*, **43**, 1114-1132.
- [4] **Schumacher, C.**, R. A. Houze, Jr., and I. Kraucunas, 2004: The tropical dynamical response to latent heating estimates derived from the TRMM Precipitation Radar. *J. Atmos. Sci.*, **61**, 1341-1358.
- [3] **Schumacher, C.**, and R. A. Houze, Jr., 2003: The TRMM Precipitation Radar's view of shallow, isolated rain. *J. Appl. Meteor.*, **42**, 1519-1524.
- [2] **Schumacher, C.**, and R. A. Houze, Jr., 2003: Stratiform rain in the tropics as seen by the TRMM

Precipitation Radar. *J. Climate*, **16**, 1739-1756.

[1] **Schumacher, C.**, and R. A. Houze, Jr., 2000: Comparison of radar data from the TRMM satellite and Kwajalein oceanic validation site. *J. Appl. Meteor.*, **39**, 2151-2164.

Courses Taught

Undergraduate

ATMO 201 *Atmospheric Sciences*

ATMO 443 *Radar Meteorology*

ATMO 459 *Tropical Meteorology (writing intensive)*

ATMO 291/491 *Undergraduate Research*

Graduate

ATMO 638 *Dynamics of Convective Clouds*

ATMO 656 *Tropical Meteorology*

Student Advising

Current graduate students

Lidia Huaman Ph.D. student since 2017

Hedanqiu Bai Ph.D. student since 2016

Montana Etten-Bohm Ph.D. student since 2016

Sophie Mayne Ph.D. student since 2015

Former graduate students

Fiaz Ahmed Ph.D. (2016)

Hannah Upton M.S. (2016)

Chris Dupuis M.S. (2016)

Emily Monroe M.S. (2016)

Keith White M.S. (2015)

Cristiano Eichholz Visiting Ph.D. (2015), Brazilian advisor: Luiz Machado

Aaron Funk M.S. (2013)

Amanda DePasquale M.S. (2013), co-chair with A. Rapp

Justin Stachnik Ph.D. (2013)

Jonathan Fliegel M.S. (2012)

Larry Hopper Ph.D. (2011), M.S. (2008)

Elinor Martin Ph.D. (2011)

Matt Mosier M.S. (2009), co-chair with R. Orville

Sean Casey Ph.D. (2009), M.S. (2007), co-chair with A. Dessler

Wei Li Ph.D. (2009)

Celina Hernandez M.S. (2008)

Karen Brugman M.S. (2007)

Kaycee Frederick M.S. (2006)

Supported undergraduate research assistants

Leland MacDonald Fall 2016 – present

Lily Campbell Fall 2015 – Spring 2017

Michaela Rosenmayer Spring 2014 – Spring 2015

Rachel Sodowsky Fall 2012 – Spring 2014

Stephanie Stevenson Summer 2011 – Summer 2012

Aaron Funk Summer 2010 – Summer 2011

Chad Phelps	Spring 2010 – Spring 2011
Aaron Ferrel	Fall 2007 – Summer 2009
Collin Lawrence	Fall 2007 – Summer 2009
Emily Borchard	Summer 2008
Cameron Homeyer	Summer 2007 – Spring 2008

REU mentees

Taylor Aydell	Summer 2017
Holly Mallinson	Summer 2015
Kaitlin Rutt	Summer 2014
DeVondria Reynolds	Summer 2013
Casey Peirano	Summer 2011

External Service Activities

World Climate Research Programme (WCRP)/World Weather Research Programme (WWRP)
Subseasonal Prediction Project (S2S) Teleconnections Subproject Committee (2015-present)

Department of Energy

ARM User Executive Committee (2017-present)
Cloud Life Cycle Group – Mesoscale Convective Organization Subtheme Co-chair (2013-2015)
ASR Radar Science Steering Committee (2012-2015)

American Meteorological Society

Atmospheric Research Awards Committee (2016-present)
Awards Nominating Committee (2015)
Field Campaign Program Committee of the 36th Radar Conference (2013)
STAC Committee on Tropical Meteorology and Tropical Cyclones (2009-2012)
Co-organizer 29th Conference on Hurricanes and Tropical Meteorology (2010)
Committee of Judges for Undergraduate Awards Member (2005-2009) and Chair (2007-2008)
Committee for the Geotis Prize 2007 (33rd International Conference on Radar Meteorology)
Max Eaton Committee 2004, 2006, 2010 (26th, 27th, and 29th Conference on Hurricanes and Tropical Meteorology)

National Weather Association

Membership and Marketing Committee (2009-2011)