Brian Medeiros

AMP/CGD/NCAR
P.O. Box 3000
Boulder, CO, 80307-3000

e: brianpm@ucar.edu
p: 303.497.1402
w: http://www.cgd.ucar.edu/~brianpm

ResearcherID: A-3695-2009
ORCiD: 0000-0003-2188-4784

Education

Ph.D. Atmospheric & Oceanic Sciences, UCLA, 2007
Dissertation: Cloud-climate interactions in general circulation models.
Advisor: Bjorn Stevens

M.Sc. Atmospheric Sciences, UCLA, 2003

B.A. Physics, UC Berkeley, 2000

Professional Experience

Project Scientist II 2015–present, NCAR CGD

Project Scientist I 2009–2015, NCAR CGD

Postdoctoral Researcher 2007–2009, UCLA AOS,
visitor to Colorado State University, Dept. of Atmospheric Science, Center for Multiscale Modeling of Atmospheric Processes (CMMAP, host: David Randall)

Graduate Student Researcher 2002–2007, UCLA AOS

Lab Assistant 1999–2001, Physics Department, UC Berkeley

Awards & Fellowships

Editors' Citation for Excellence in Refereeing for Journal of Advances in Modeling Earth Systems (JAMES), 2015. [eos]

Brian Bosart Memorial Award for outstanding service contribution by a graduate student. UCLA AOS, Fall 2006.

Edwin W. Pauley Fellowship UCLA, 2001-2002, 2003-2004.

Teaching & Mentoring Experience

Dissertation Committee Eleanor Middlemas, RSMAS, U Miami; William Frey, U. Colorado

Graduate Student Host Eleanor Middlemas, RSMAS, U Miami, Summer 2016.

Research Mentor 2016, SOARS, UCAR.

Research Mentor 2014, SOARS, UCAR.

Graduate Student Host Felix Pithan, MPI-M, Hamburg. Summer 2013.

UCLA AOS
Teaching Assistant, "Air Pollution," AS 2, Fall 2002.
Tutorial organizer & instructor, "A crash course in unix," September 2006.

UC Berkeley, Dept. of Physics

Teaching Assistant, "Thermodynamics, Electricity & Magnetism," Phys. 7B, Fall 2000.
Teaching Assistant, "Basic Semiconductor Circuits Lab," Phys. 111, Spring 2001.

UC Berkeley Extension

Teaching Assistant, "Introduction to Astronomy," Fall 2000.

Research Grants

[current] PI, Tropical-Extratropical Interactions in a Hierarchy of Model Complexity, 15 May 2017 – 30 April 2020, University of Miami/National Science Foundation. NSF FAIN: 1650209

[current] PI, Evaluation of and Improvements to Components of Climate System Models, January 2013–December 2017, Department of Energy. DE-FC02-97ER62402

[complete] PI, RAPID: Developing a Community Aquaplanet Model, 8/1/15 - 7/31/16, University of Miami/National Science Foundation. NSF FAIN: 1547910

Academic Service

Committees & Working Groups

US CLIVAR Upper-ocean heat budget synthesis for the eastern equatorial Pacific and Atlantic Oceans (2012–present) http://www.usclivar.org/working-groups/etos

CMMAP Education & Diversity Oversight Committee (2008/9)

UCLA AOS computer committee (2003-2007), UCLA AOS web committee (2003-2007)

Organizing & Convening

Co-Convener Toward Reducing Systematic Errors in Weather and Climate Models: Evaluation, Understanding, and Improvement, AGU Fall Meeting 2016 (Sessions A43G, A52D, A53K).

Co-Convener Leveraging Model Hierarchies to Understand the Climate System, AGU Fall Meeting 2016 (Session A11F).

Co-Convener Toward Reducing Systematic Errors in Weather and Climate Models: Evaluation, Understanding, and Improvement, AGU Fall Meeting 2015 (Sessions A21E, A23O).

Co-Convener Convection across Scales: Aggregation, Organization, and Stochasticity, AGU Fall Meeting 2015 (Sessions A51F, A53E).

Organizer NOAA/DOE Workshop on High-Resolution Coupling and Initialization to Improve Predictability and Predictions in Climate Models, 30 September – 2 October 2015, NCWCP Conference Center, College Park, Maryland.

Co-Convener Toward Reducing Systematic Errors in Weather and Climate Models: Evaluation, Understanding, and Improvement, AGU Fall Meeting 2014.

Organizer NCAR CGD seminar series, 2014-5 (backup 2013-4).

Coordinator NCAR AMP weekly meeting, 2012–present.

Organizer UCLA AOS Student Seminar Series, Summer 2005.

Organizer UCLA AOS Climate Dynamics Seminar (AOS 272), Fall 2003.

Reviewer Atmos. Chem. & Phys., Atmos. Sci. Lett., Bull. Amer. Meteor. Soc., Boundary Layer Meteorology, Clim. Dyn., Geosci. Mdl. Dev., Geophys. Res. Lett., J. Advances in Modeling Earth Systems, J. Appl. Meteorol., J. Atmos. Sci., J. Climate, J. Geophys. Res., Meteor. & Atm. Phys., Mon. Weather Rev., Science, Science China Earth Sciences, Tellus, Quart. J. Roy. Meteor. Soc., Eos, JAMSTEC, European Commission, Department of Energy, Department of Interior, National Science Foundation, NCAR (internal).

Professional Societies American Meteorological Society (member), American Geophysical Union (member), Cloud Appreciation Society (member), Chi Epsilon Pi (AOS Student Organization; Webmaster, 2003-7, President, 2001-2)

Invited Presentations

The role of shallow cumulus in the climate system, and asking how bad is "good enough" for climate models. Colorado State University, Atmospheric Sciences Department Colloquium, 21 October 2016, Fort Collins, CO.

How much do cloud errors matter in coupled modelling? ECMWF Annual Seminar, 5–8 September 2016, Reading, UK.

Bringing climate models and observations together using a weather forecast approach: Scenes from the tropical Pacific, Joint CGD/EOL Seminar, May 2014.

Boundary layer structure in the subtropical stratocumulus decks of the Community Atmosphere Model, 2012 AGU Fall Meeting, abstract A54E-02.

Southeast Pacific stratocumulus in two versions of the Community Atmosphere Model, Max-Planck-Institut für Meteorologie, ZMAW / Klimacampus Seminar, 24 October 2012, Hamburg, Germany.

Idealized climate change experiments from the CMIP5 archive, Max-Planck-Institut für Meteorologie, The Atmosphere in the Earth System, Large-scale Dynamics Seminar, 22 October 2012, Hamburg, Germany.

Evaluating CAM's clouds with satellite simulators, NASA Sounder Science Meeting, Greenbelt, MD, November 2011.

East Pacific Low Clouds in CAPT Simulations using CAM4 and CAM5, Meeting of the CPT on Stratocumulus to Cumulus Transition, Boulder, CO, October 2011.

On the new CESM boundary layer: physics interactions & the subtropical south Atlantic. Workshop on Coupled Ocean-Atmosphere-Land Processes in the Tropical Atlantic, Miami, FL, USA, March 2011.

Insidious little clouds: Shallow cumulus in climate models.
NCAR CGD Seminar, August, 2009.

Ordinary clouds and their extraordinary impacts.
CMMAP 7^{th} Team Meeting, Fort Collins, CO, July, 2009.

The Little Clouds That Could
Mesoscale & Microscale Meteorology (MMM) Seminar, NCAR, Boulder, CO, April 2009.

Big Trouble with Little Clouds.
Rosenstiel School for Marine and Atmospheric Sciences, U. Miami, Florida, November 2008.
Max Plank Institut für Meteorologie, Hamburg, Germany, October 2008.
Eidgenössische Technische Hochschule (ETH) Zürich, Switzerland, October 2008.
Jet Propulsion Laboratory, NASA/Caltech, Pasadena, California, October 2008.

Cloud-Climate interactions in GCMs: An aquaplanet perspective. 4th Pan-GCSS Meeting on Advances in Modeling and Observing Clouds and Convection, Toulouse, France, June 2008.

Can aquaplanets predict a GCM's climate sensitivity? Colorado State University, Dept. of Atmos. Sci., October 2007.

Refereed Publications

34. Benedict, J., B. Medeiros, A. Clement, and A. Pendergrass, 2017: Sensitivities of the Hydrologic Cycle to Model Physics, Grid Resolution, and Ocean Type in the Aquaplanet Community Atmosphere Model, *J. Adv. Model. Earth Syst.,* . DOI: 10.1002/2016MS000891.

33. Voigt, A., R. Pincus, B. Stevens, S. Bony, O. Boucher, N. Bellouin, A. Lewinschal, B. Medeiros, Z. Wang, H. Zhang, 2017: Fast and slow shifts of the zonal-mean intertropical convergence zone in response to an idealized anthropogenic aerosol, *J. Adv. Model. Earth Syst.*. DOI: 10.1002/2016MS000902.

32. Webb, M., T. Andrews, A. Bodas-Salcedo, S. Bony, C. Bretherton, R. Chadwick, H. Chepfer, H. Douville, P. Good, J. Kay, S. Klein, R. Marchand, B. Medeiros, P. Siebesma, C. Skinner, B. Stevens, G. Tselioudis, Y. Tsushima, and M. Watanabe, 2017: The Cloud Feedback Model Intercomparison Project (CFMIP) contribution to CMIP6, *Geoscientific Model Development*, 10 (1), 359âĂŞ384. DOI: 10.5194/gmd-10-359-2017.

31. Pendergrass, A., K. A. Reed, and B. Medeiros, 2016: The link between extreme precipitation and convective organization in a warming climate: Global radiative convective equilibrium simulations, *Geophys. Res. Lett.* 43 (21), 11,445–11,452. DOI: 10.1002/2016GL071285. [eos coverage]

30. Grise, K. and B. Medeiros: Understanding the varied influence of mid-latitude jet position on clouds and cloud-radiative effects in observations and global climate models, *J. Clim.*, 29 (24), 9005âĂŞ9025. DOI: 10.1175/JCLI-D-16-0295.1.

29. Pithan, F., A. Ackerman, W. M. Angevine, K. Hartung, L. Ickes, M. Kelley, B. Medeiros, I. Sandu, G.-J. Steeneveld, H. Sterk, G. Svensson, P. A. Vaillancourt, and A. Zadra, 2016:. Select strengths and biases of models in representing the arctic winter boundary layer: The Larcform 1 single column model intercomparison., *J. Adv. Model. Earth Syst.* DOI: 10.1002/2016MS000630

28. Bony, S., B. Stevens, D. Coppin, T. Becker, K. Reed, A. Voigt, and B. Medeiros, 2016: Thermodynamic control of anvil-cloud amount, *P. Natl. Acad. Sci.*, 113 (32), 8927–8932. DOI: 10.1073/pnas.1601472113

27. Gettelman, A., L. Lin, B. Medeiros, and J. Olson, 2016: Climate Feedback Variance and the Interaction of Aerosol Forcing and Feedbacks, *J. Clim.*, 29 (18), 6659–6675. DOI: 10.1175/JCLI-D-16-0151.1

26. Zuidema, P., P. Chang, B. Medeiros, B. Kirtman, R. Mechoso, E. Schneider, T. Toniazzo, I. Richter, J. Small, K. Bellomo, P. Brandt, S. de Szoeke, T. Farrar, E. Jung, S. Kato, M. Li, C. Patricola, Z. Wang, R. Wood, and Z. Xu, 201X: Challenges and Prospects for Reducing Coupled Climate Model SST Biases in the Eastern Tropical Atlantic and Pacific Oceans: The U.S. CLIVAR Eastern Tropical Oceans Synthesis Working Group *BAMS*, 97 (12), 2305–2327. DOI: 10.1175/BAMS-D-15-00274.1

25. Medeiros, B. and L. Nuijens, 2016: Clouds at Barbados are representative of clouds across the trade-wind regions in observations and climate models, *P. Natl. Acad. Sci.* 113 (22), E3062–E3070, DOI: 10.1073/pnas.1521494113

24. Medeiros, B., David L. Williamson, and Jerry G. Olson, 2016: Reference aquaplanet climate in the Community Atmosphere Model Version 5. *J. Adv. Model. Earth Syst.*, 8 (1), 406–424. DOI: 10.1002/2015MS000593

23. Reed, K. A. and B. Medeiros, 2016: A reduced complexity framework to bridge the gap between AGCMs and cloud-resolving models, *GRL*, 43 (2), 860–866. DOI: 10.1002/2015GL066713

22. Kay, J. E., C. Wall, V. Yettella, B. Medeiros, C. Hannay, P. Caldwell, and C. Bitz, 2016: Global climate impacts of fixing the Southern Ocean shortwave radiation bias in the Community Earth System Model (CESM). *J. Clim.* 29 (12), 4617–4636. DOI: 10.1175/JCLI-D-15-0358.1

21. Zhang, H., A. Clement, B. Medeiros, 2015: The Meridional Mode in an Idealized Aquaplanet Model: Dependence on the Mean State. *J. Clim.,* 29 (8), 2889–2905. DOI: 10.1175/JCLI-D-15-0399.1

20. Nuijens, L., B. Medeiros, I. Sandu, M. Ahlgrimm, 2015: Observed and modeled patterns of co-variability between low-level cloudiness and the structure of the trade-wind layer. *J. Adv. Model. Earth Syst.*, 7 (4), 1741-1764. DOI: 10.1002/2015MS000483

19. Nuijens, L., B. Medeiros, I. Sandu, M. Ahlgrimm, 2015: The behavior of trade-wind cloudiness in observations and models: The major cloud components and their variability, *J. Adv. Model. Earth Syst.*, 7 (2), 600–616. DOI: 10.1002/2014MS000390

18. Reed, K. A., B. Medeiros, J. Bacmeister, P. H. Lauritzen, 2015: Global Radiative-Convective Equilibrium in the Community Atmosphere Model 5, *JAS* 72(5), pp. 2183–2197. DOI: 10.1175/JAS-D-14-0268.1

17. Medeiros, B., B. Stevens, and S. Bony, 2015: Using aquaplanets to understand the robust responses of comprehensive climate models to forcing, *Climate Dynamics* 44(7), pp 1957–1977. DOI: 10.1007/s00382-014-2138-0

16. Kay, J.E., B. Medeiros, Y.-T. Hwang, A. Gettelman, J. Perket, and M.G. Flanner, 2014: Processes controlling Southern Ocean shortwave climate feedbacks in CESM, *Geophys. Res. Lett.*, 41 (2), 616–622. DOI: 10.1002/2013GL058315

15. Ma, H.-Y., S. Xie, S. A. Klein, K. D. Williams, J. S. Boyle, S. Bony, H. Douville, S. Fermepin, B. Medeiros, S. Tyteca, M. Watanabe, and D. Williamson, 2014: On the correspondence between mean forecast errors and climate errors in CMIP5 models, *Journal of Climate*, 27, 1781–1798. DOI: 10.1175/JCLI-D-13-00474.1

14. Pithan, F., B. Medeiros, and T. Mauritsen, 2014: Mixed-phase clouds cause GCM biases in Arctic winter boundary layers, *Climate Dynamics*, 43 (1–2), pp. 289–303. DOI: 10.1007/s00382-013-1964-9

13. Williams, K. D., A. Bodas-Salcedo, M. Déqué, S. Fermepin, B. Medeiros, M. Watanabe, C. Jakob, S. A. Klein, C. A. Senior, and D. L. Williamson, 2013: The Transpose-AMIP II experiment and its application to the understanding of Southern Ocean cloud biases in climate models, *J. Climate*, 26, 3258–3274. DOI: 10.1175/JCLI-D-12-00429.1

12. Seidel, D. J., Y. Zhang, A. C. M. Beljaars, J.-C. Golaz, A. R. Jacobson, and B. Medeiros, 2012: Climatology of the planetary boundary layer over the continental United States and Europe, *J. Geophys. Res.* 117(D17):D17106, DOI: 10.1029/2012JD018143

11. Medeiros, B., D. L. Williamson, C. Hannay, and J. G. Olson, 2012: Southeast Pacific stratocumulus in the Community Atmosphere Model, *J. Climate*, 25, 6175–6192. DOI: 10.1175/JCLI-D-11-00503.1

10. Kay, J. E., B. R. Hillman, S. A. Klein, Y. Zhang, B. Medeiros, R. Pincus, A. Gettelman, B. Eaton, J. Boyle, R. Marchand, and T. P. Ackerman, 2012: Exposing global cloud biases in the Community Atmosphere Model (CAM) using satellite observations and their corresponding instrument simulators, *J. Climate* 25(15), pp. 5190–5207. DOI: 10.1175/JCLI-D-11-00469.1

9. de Boer, G., W. Chapman, J. E. Kay, B. Medeiros, M. D. Shupe, S. Vavrus, and J. Walsh, 2012: A Characterization of the Present-Day Arctic Atmosphere in CCSM4, *J. Climate* 25(8), pp. 2676–2695. DOI: 10.1175/JCLI-D-11-00228.1

8. Medeiros, B., C. Deser, R. A. Tomas, and J. E. Kay 2011: Arctic inversion strength in climate models, *J. Climate*, 24(17), pp. 4733–4740. DOI: 10.1175/2011JCLI3968.1

7. Medeiros, B., and B. Stevens, 2011: Revealing differences in GCM representations of low clouds. *Climate Dynamics*, 36(1), pp. 385-399. DOI: 10.1007/s00382-009-0694-5

6. Medeiros, B., L. Nuijens, C. Antoniazzi, and B. Stevens, 2010: Low-latitude boundary layer clouds as seen by CALIPSO, *J. Geophys. Res.*, 115, D23207. DOI: 10.1029/2010JD014437

5. Zhang, Y., B. Stevens, B. Medeiros and M. Ghil, 2009: Low-cloud fraction, lower-tropospheric stability and large-scale divergence. *J. Climate*, 22, 4827-4844. DOI: 10.1175/2009JCLI2891.1

4. Medeiros, B., B. Stevens, I. M. Held, M. Zhao, D. L. Williamson, J. G. Olson, and C. S. Bretherton, 2008: Aquaplanets, climate sensitivity, and low clouds. *J. Climate*, 21(19), p. 4974–4991. DOI: 10.1175/2008JCLI1995.1

3. Rauber, R.M., B. Stevens, J. Davison, S. Göke, O.L. Mayol-Bracero, D. Rogers, P. Zuidema, H.T. Ochs, C. Knight, J. Jensen, S. Bereznicki, S. Bordoni, H. Caro-Gautier, M. Colón-Robles, M. Deliz, S. Donaher, V. Ghate, E. Grzeszczak, C. Henry, A. Marie Hertel, I. Jo, M. Kruk, J. Lowenstein, J. Malley, B. Medeiros, Y. Méndez-Lopez, S. Mishra, F. Morales-García, L.A. Nuijens, D. O'Donnell, D.L. Ortiz-Montalvo, K. Rasmussen, E. Riepe, S. Scalia, E. Serpetzoglou, H. Shen, M. Siedsma, J. Small, E. Snodgrass, P. Trivej, and J. Zawislak, 2007: In the Driver's Seat: Rico and Education. *Bull. Amer. Meteor. Soc.*, 88, 1929–1937. DOI: 10.1175/BAMS-88-12-1929

2. Medeiros, B., A. Hall, and B. Stevens, 2005: What controls the climatological depth of the PBL? *J. Climate*, 18(16), p. 2877–2892. DOI: 10.1175/JCLI3417.1

1. Karner, D. B., J. Levine, B.P. Medeiros, and R.A. Muller, 2002: Constructing a stacked benthic $\delta^{18}O$ record. Paleoceanography, 17(3), p. 2-1 – 2-17. DOI: 10.1029/2001PA000667

Non-refereed Publications

5. Kinter J, O'Brien T, Klein, S, Lin SJ, Medeiros B, Penny S, Putman W, Raeder K, Mariotti A, Joseph R, 2016: High-Resolution Coupling and Initialization to Improve Predictability and Predictions in Climate Models Workshop. U.S. Department of Energy, DOE/SC-0183; U.S. Department of Commerce NOAA Technical Report OAR CPO-5. DOI: 10.7289/V5K35RNX.

4. Zuidema et al. Challenges and Future Prospects for Reducing Coupled Climate Model SST Biases in the Eastern Tropical Atlantic and Pacific Oceans: A White Paper by the U.S. CLIVAR Eastern Tropical Oceans Synthesis Working Group.

3. Medeiros, B., 2013, Book Review: "Atmosphere, Clouds and Climate" by David Randall, Bull. Amer. Meteor. Soc., 94(8), pp. 1227–1228, August 2013.

2. Medeiros, B., 2011: Comparing the southern hemisphere stratocumulus decks in the Community Atmosphere Model. U.S. CLIVAR Newsletter, Vol. 9 No. 2, Washington, DC, 20006.

1. Karner, Daniel B., Brian Medeiros, Richard A. Muller, 1999: Dansgaard-Oeschger events and the 1.5-kyr cycle. Lawrence Berkeley Nat'l Lab Technical Report, LBNL-44529.