

CURRICULUM VITAE

DANIEL F. STEINHOFF

Current Affiliation and Contact Information

Center for Western Weather and Water Extremes (CW3E)
Scripps Institution of Oceanography
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Education

Ph.D., Atmospheric Sciences, The Ohio State University, Columbus OH, 2011
Dissertation title: “*Dynamics and Variability of Foehn Winds in the McMurdo Dry Valleys Antarctica*”
M.S., Atmospheric Sciences, The Ohio State University, Columbus OH, 2008
Thesis title: “*Cyclogenesis near the Adélie Coast and Influence of the Low-level Wind Regime*”
B.S., Atmospheric Sciences, University of Wisconsin-Madison, Madison WI, 2003

Appointments

2019-Present: Senior Mesoscale Modeler, Center for Western Weather and Water Extremes, Scripps Institution of Oceanography, University of California San Diego
2018-2019: Project Scientist II, Research Applications Laboratory, National Center for Atmospheric Research
2013-2018: Project Scientist I, Research Applications Laboratory, National Center for Atmospheric Research
2013-2016: Project Scientist, Science and Technology in Atmospheric Research (STAR), LLC (dual-appointment with NCAR and STAR)
2011-2013: Postgraduate Scientist, Research Applications Laboratory, National Center for Atmospheric Research
2005-2011: Graduate Research Associate, Polar Meteorology Group, Byrd Polar Research Center, The Ohio State University.

General Areas of Research

- Weather Research and Forecasting (WRF) simulations for synoptic-scale and mesoscale atmospheric processes
- Atmospheric Rivers and Western U.S. precipitation
- Atmospheric transport and dispersion modeling
- Vector-borne disease risk modeling
- Global climate dynamics
- Mesoscale dynamics
- Polar meteorology

Refereed Publications (26 Total, 7 First-Authored)

- 2021 Kumar, R., D. A. Mitchell, **D. F. Steinhoff**, P. Saide, B. Kosovic, N. Downey, D. Blewitt, and L. Delle Monache. Evaluating the Mobile Flux Plane (MFP) method to estimate methane emissions using large eddy simulations (LES). *J. Geophys. Res.*, accepted.
- 2020 Brandt, W. T., K. J. Bormann, F. Cannon, J. S. Deems, T. H. Painter, **D. F. Steinhoff**, and J. Dozier. Quantifying the spatial variability of a snowstorm using differential airborne lidar. *Water Resour. Res.*, **56**, doi:10.1029/2019WR025331.
- Jing, X., L. Xue, Y. Yin, J. Yang, **D. F. Steinhoff**, A. Monaghan, D. Yates, C. Liu, R. Rasmussen, S. Taraphdar, and O. Pauluis. Convection-permitting regional climate simulations in the Arabian Gulf Region using WRF driven by bias-corrected GCM data. *J. Climate*, accepted.
- 2018 **Steinhoff, D. F.**, R. Buintjes, J. Hacker, T. Keller, C. Williams, and T. Jensen. Influences of the monsoon trough and Arabian heat low on summer rainfall over the United Arab Emirates. *Mon. Wea. Rev.*, **146**, 1383-1403, doi:10.1175/MWR-D-17-0296.1.
- Saide, P., **D. F. Steinhoff**, B. Kosovic, J. Weil, N. Downey, D. Blewitt, S. Hanna, and L. Delle Monache. Evaluating methods to estimate methane emissions from oil and gas production facilities using LES simulations. *Env. Sci. Tech.*, **52 (19)**, 11206-11214, doi:10.1021/acs.est.8b01767.
- 2016 **Steinhoff, D. F.**, L. Eisen, M. J. Barlage, T. M. Hopson, I. Tarakidzwa, K. Ortiz-Rosario, S. Lozano-Fuentes, M. H. Hayden, P. E. Bieringer, C. Welsh-Rodriguez, and A. J. Monaghan. WHATCH'EM: A weather-driven energy balance model for determining water height and temperature in container habitats for *Aedes aegypti*. *Earth Interactions*, **20(24)**, 1-31, doi:10.1175/EI-D-15-0048.1.
- Herring, S. J., S. Batchelor, P. E. Bieringer, B. Lingard, D. M. Lorenzetti, S. T. Parker, L. Rodriguez, M. D. Sohn, **D. Steinhoff**, and M. Wolski. Providing pressure inputs to multizone building models. *Building and Environment*, **101**, 32-44, doi:10.1016/j.buildenv.2016.02.012.
- Monaghan, A.J., C.W. Morin, **D.F. Steinhoff**, O.V. Wilhelmi, M.H. Hayden, D.A. Quattrochi, M.H. Reiskind, A.L. Lloyd, K.A. Smith, C.A. Schmidt, P. Scalf, and K.C. Ernst. On the seasonal occurrence and abundance of the Zika virus vector mosquito *Aedes aegypti* in the contiguous United States. *PLoS Currents Outbreaks*, **1**, doi:10.1371/currents.outbreaks.50dfc7f46798675fc63e7d7da563da76.
- Monaghan, A. J., K. Sampson, **D. F. Steinhoff**, K. C. Ernst, K. L. Ebi, B. Jones, and M. H. Hayden. The potential impacts of 21st century climatic and population changes on human exposure to the virus vector mosquito *Aedes aegypti*. *Climatic Change*, doi:10.1007/s10584-016-1679-0.
- 2015 **Steinhoff, D. F.**, A. J. Monaghan, and M. P. Clark. Projected impact of 21st century ENSO changes on rainfall in Central America and northwest South America from CMIP5 AOGCMs. *Clim. Dyn.*, **44**, 1329-1349, doi:10.1007/s00382-014-2196-3.

- Dickinson, K. L., E. Kanyomse, R. Piedrahita, E. Coffey, I. Rivera, J. Adoctor, R. Aligiria, D. Muvandimwe, M. Dove, V. Dukic, M. Hayden, D. Diaz-Sanchez, V. Adoctor, D. Anaseba, Y. Slichter, N. Masson, A.J. Monaghan, A. Titiati, **D. F. Steinhoff**, Y-Y. Hsu, R. Kaspar, B. Brooks, A. Hodgson, M. Hannigan, A. R. Oduro and C. Wiedinmyer. Research on Emissions, Air quality, Climate, and Cooking Technologies in Northern Ghana (REACCTING): Study Rationale and Protocol. *BMC Public Health*, **15**, doi:10.1186/s12889-015-1414-1.
- Oleson, K. W., A. Monaghan, O. Wilhelmi, M. Barlage, N. Brunzell, J. Feddema, L. Hu, and **D. F. Steinhoff**. Interactions between urbanization, heat stress, and climate change. *Climatic Change*, **129**, 525-541, doi:10.1007/s10584-013-0936-8.
- 2014 **Steinhoff, D. F.**, D. H. Bromwich, J. C. Speirs, H. A. McGowan, and A. J. Monaghan. Austral summer foehn winds over the McMurdo Dry Valleys of Antarctica from Polar WRF. *Quart. J. Roy. Meteor. Soc.*, **140**, 1825-1837, doi:10.1002/qj.2278.
- Abdussalam, A., A. J. Monaghan, **D. F. Steinhoff**, V. Dukic, M. Hayden, T. Hopson, J. Thornes, and G. Leckebusch. The impact of climate change on meningitis in northwest Nigeria: An assessment using CMIP5 climate model simulations. *Wea. Clim. Soc.*, **6**, 371-379, doi:10.1175/WCAS-D-13-00068.1.
- Eisen, L., A. J. Monaghan, S. Lozano-Fuentes, **D. F. Steinhoff**, M. H. Hayden, and P. E. Bieringer. The impact of temperature on the bionomics of the vector mosquito *Aedes (Stegomyia) aegypti*, with special reference to the cool geographic range margins. *J. Medical Entomology*, **51**, 496-516, doi:10.1603/ME13214.
- Lozano-Fuentes, S., C. Welsh-Rodriguez, A. J. Monaghan, **D. F. Steinhoff**, C. Ochoa-Martinez, B. Tapia-Santos, M. H. Hayden, and L. Eisen. Intra-annual changes in abundance of *Aedes (Stegomyia) aegypti* and *Aedes (Ochlerotatus) epactius* (Diptera: Culicidae) in high-elevation communities in México. *J. Medical Entomology*, **51**, 742-751, doi:10.1603/ME14015.
- 2013 **Steinhoff, D. F.**, D. H. Bromwich, and A. J. Monaghan. Dynamics of the foehn mechanism in the McMurdo Dry Valleys Antarctica from Polar WRF. *Quart. J. Roy. Meteor. Soc.*, **139**, 1615-1631, doi:10.1002/qj.2038.
- Ballinger, T. J., T. W. Schmidlin, and **D. F. Steinhoff**. The Polar Marine climate revisited. *J. Climate*, **26**, 3935-3952, doi:10.1175/JCLI-D-12-00660.1.
- Speirs, J. C., H. A. McGowan, **D. F. Steinhoff**, and D. H. Bromwich. Regional climate variability driven by foehn winds in the McMurdo Dry Valleys, Antarctica. *Int. J. Climatol.*, **33**, 945-958, doi:10.1002/joc.3481.
- Zawar-Reza, P., K. Marwan, I. Soltanzadeh, T. Dallafior, S. Zhong, **D. F. Steinhoff**, B. Storey, and C. Carey. Pseudo-vertical temperature profiles give insight into winter evolution of the atmospheric boundary layer over the McMurdo Dry Valleys of Antarctica. *J. Appl. Meteor. Climatol.*, **52**, 1664-1669, doi:10.1175/JAMC-D-13-034.1.
- 2012 Lozano-Fuentes, S., M. H. Hayden, C. Welsh-Rodriguez, C. Ochoa-Martinez, B. Tapia-Santos, K. C. Kobylinski, C. K. Uejio, E. Zielinski-Gutierrez, L. Delle Monache, A. J. Monaghan, **D. F. Steinhoff**, and L. Eisen. The dengue virus mosquito vector *Aedes aegypti* at high elevation in México. *American Journal of Tropical Medicine and Hygiene*, **87(5)**, 902-909, doi:10.4269/ajtmh.2012.12-0244.

- Lozano-Fuentes, S., C. Welsh-Rodriguez, M. H. Hayden, B. Tapia-Santos, C. Ochoa-Martinez, K. C. Kobylinski, C. K. Uejio, E. Zielinski-Gutierrez, L. Delle Monache, A. J. Monaghan, **D. F. Steinhoff**, and L. Eisen. *Aedes (Ochlerotatus) epactius* Dyar & Knab along an elevation and climate gradient in Veracruz and Puebla States, México. *J. Medical Entomology*, **49(6)**, 1244-1253, doi:10.1603/ME12067.
- 2011 Bromwich, D. H., **D. F. Steinhoff**, I. Simmonds, K. Keay, and R. L. Fogt. Climatological aspects of cyclogenesis near Adélie Land Antarctica. *Tellus*, **63A**, 921-938, doi:10.1111/j.1600-0870.2011.00537.x.
- 2010 Speirs, J. C., **D. F. Steinhoff**, H. A. McGowan, D. H. Bromwich, and A. J. Monaghan. Foehn winds in the McMurdo Dry Valleys, Antarctica: The origin of extreme warming events. *J. Climate*, **23**, 3577-3598, doi:10.1175/2010JCLI3382.1.
- 2009 **Steinhoff, D. F.**, S. Chaudhuri, and D. H. Bromwich. A new perspective on the Ross Ice Shelf Air Stream. *Mon. Wea. Rev.*, **137**, 4030-4046, doi:10.1175/2009MWR2880.1.
- 2008 **Steinhoff, D. F.**, D. H. Bromwich, M. Lambertson, S. L. Knuth, and M. A. Lazzara. A dynamical investigation of the May 2004 McMurdo Antarctica severe wind event using AMPS. *Mon. Wea. Rev.*, **136**, 7-26, doi:10.1175/2007MWR1999.1.

Other Publications

- 2015 Bruyère, C. L., A. J. Monaghan, **D. F. Steinhoff**, and D. Yates. Bias-corrected CMIP5 CESM data in WRF/MPAS intermediate file format. NCAR Tech Note NCAR/TN 515+STR, doi:10.5065/D6445JJ7.

Current and Past Grant Activities

- *Project Title*: “Chemical biological defense modeling and virtual environment development”
Source of Support: U.S. Defense Threat Reduction Agency (DTRA)
Award Amount: \$3.75M-\$7.5M
Period Covered: 10/2017-9/2021
Affiliation: Co-PI
- *Project Title*: Development of predictive risk models for human monkeypox cases based on meteorological descriptors”
Source of Support: CDC
Award Amount: \$100,000
Period Covered: 6/2018-5/2019
Affiliation: PI
- *Project Title*: “Evaluation and Recommendation of State-of-the-art Source Term Estimation Methods for Methane Emission Applications”
Source of Support: ExxonMobil
Award Amount: \$300,000
Period Covered: 1/2017-3/2019
Affiliation: PI
- *Project Title*: “Global Modeling of the Climatic Suitability of Artificial Water Containers for Present Day and Climate Change Applications”

Source of Support: NASA ROSES New Investigator Program (NIP), Solicitation NNH13ZDA001N

Award Amount: \$210,148

Period Covered: 7/2014-6/2018

Affiliation: PI

- *Project Title:* “Chemical biological defense modeling and virtual environment development”

Source of Support: U.S. Defense Threat Reduction Agency (DTRA)

Award Amount: \$750,000

Period Covered: 10/2015-9/2017

Affiliation: Co-PI

Honors

- UCAR Outstanding Publication Award (“On the seasonal occurrence and abundance of the Zika virus vector mosquito *Aedes aegypti* in the contiguous United States”), 2017.
- RAL Outstanding Publication Award (“On the seasonal occurrence and abundance of the Zika virus vector mosquito *Aedes aegypti* in the contiguous United States”), 2017.
- Ray Travel Award recipient (for IAMAS Montréal), The Ohio State University Council of Graduate Students, 2009.
- Student Poster Award, American Meteorological Society 10th Conference on Polar Meteorology and Oceanography, 2009.
- Recipient of the Rick Toracinta Graduate Scholarship in Atmospheric Science, The Ohio State University, 2008.
- NSF-OPP Travel Grant to International Union of Geodesy and Geophysics (IUGG) symposium, 2007.
- UCAR Travel Award to FORMOSAT-3/COSMIC Science Summer Camp, 2005.

Community Activities

- Reviewer for 17 different peer-reviewed journals.
- Member of Wyoming–NCAR Resource Advisory Panel (WRAP), May 2018–March 2019.
- Panel reviewer for NASA earth science proposals, April 2017 and April 2020.
- Mentor to Gabriela D. Talavera-Santiago, UCAR/NCAR Spark Pre-College Internship Program, June–August 2013.
- Mentor to Saptarshi Chaudhuri, Columbus Alternative High School, Columbus OH, summer internship, approximately 40 hours per week, June – August 2008. This work resulted in a manuscript in *Monthly Weather Review*. Saptarshi completed undergraduate studies at Caltech and graduate studies at Stanford.
- 43 presentations to school field trips (K-12 and college) to Byrd Polar Research Center, January 2008–March 2011.
- Mentor to Ruth Burrows, Upper Arlington High School, Upper Arlington OH, science fair project, meetings every 1-2 weeks, November 2006 – February 2007.
- Representative for Atmospheric Sciences to the Council of Graduate Students (CGS), The Ohio State University, 2006-07.

Conference Presentations

- Steinhoff, D. F., L. Delle Monache, B. Kawzenuk, C. Papadopoulos, R. Weihs, D. Reynolds, L. Dehaan, and F. M. Ralph, 2021: Description and Validation of the 34-year West-WRF Reforecast. *American Meteorological Society Annual Meeting*, January 2021.
- Steinhoff, D. F., 2018: Present Day and Future Population Dynamics of the Dengue Vector Mosquito *Aedes aegypti* Using a Water Container Energy Balance Model. *American Meteorological Society Annual Meeting*, Austin TX, January 2018.
- Steinhoff, D. F., 2017: Present Day and Future Population Dynamics of the Dengue Vector Mosquito *Aedes aegypti* Using a Water Container Energy Balance Model. *American Geophysical Union Fall Meeting*, New Orleans LA, December 2017.
- Steinhoff, D. F., and T. Keller, 2017: Rain in the desert: insights into a precious resource in the United Arab Emirates. *RAL Retreat*, Boulder, CO, December 2017.
- Steinhoff, D. F., and A. J. Monaghan, 2017: Present day and future population dynamics of the dengue vector mosquito *Aedes aegypti* using a water container energy balance model. *International Congress of Biometeorology*, Durham, UK, September 2017.
- Steinhoff, D. F., 2017: Assessing the Impacts of Climate Change Scenarios on the Dengue Vector Mosquito *Aedes aegypti* Using a Water Container Energy Balance Model. *American Meteorological Society Annual Meeting*, Seattle WA, January 2017.
- Steinhoff, D. F., 2016: *Aedes aegypti* Global Suitability Maps Using a Water Container Energy Balance Model for Dengue Risk Applications. *American Meteorological Society Annual Meeting*, New Orleans LA, January 2016.
- Steinhoff, D. F., 2015: *Aedes aegypti* Global Suitability Maps Using a Water Container Energy Balance Model for Dengue Risk Applications. *American Geophysical Union Fall Meeting*, San Francisco CA, December 2015.
- Steinhoff, D. F., P. E. Bieringer, A. J. Monaghan, L. Eisen, S. Lozano-Fuentes, M. Hayden, C. Welsh-Rodriguez, G. Bieberbach, and C. Kiley, 2015: Dengue Disease Vector Mapping via Environmental/ Climatological/Sociological Factors. *Chemical and Biological Defense Science and Technology Conference*, St. Louis MO, May 2015.
- Steinhoff, D. F., and A. J. Monaghan, 2015: Coupling of a Water Container Energy Balance Model with Gridded NASA Earth Science Products for Dengue Risk Applications. *American Meteorological Society Annual Meeting*, Phoenix AZ, January 2015.
- Steinhoff, D. F., and A. J. Monaghan, 2014: The Water Height and Temperature in Container Habitats Energy Model. *American Meteorological Society Annual Meeting*, Atlanta GA, February 2014.
- Steinhoff, D. F., D. H. Bromwich, and A. J. Monaghan, 2010: Polar WRF simulations of the McMurdo Dry Valleys. *Fifth Antarctic Meteorological Observation, Modeling, and Forecasting Workshop*, Columbus OH, July 2010.
- Steinhoff, D. F., and D. H. Bromwich, 2010: The effects of grid nudging on Polar WRF forecasts in Antarctica. *Fifth Antarctic Meteorological Observation, Modeling, and Forecasting Workshop*, Columbus OH, July 2010.
- Steinhoff, D. F., D. H. Bromwich, J. C. Speirs, H. A. McGowan, and A. J. Monaghan, 2009: Foehn winds in the McMurdo Dry Valleys of Antarctica. *MOCA-09 (IAMAS-IAPSO-IACS Joint Assembly)*, Montréal, Québec, Canada, July 2009.

- Steinhoff, D. F., D. H. Bromwich, J. C. Speirs, H. A. McGowan, and A. J. Monaghan, 2009: Foehn winds in the McMurdo Dry Valleys of Antarctica. *Fourth Antarctic Meteorological Observation, Modeling, and Forecasting Workshop*, Charleston SC, July 2009.
- Steinhoff, D. F., D. H. Bromwich, J. C. Speirs, H. A. McGowan, and A. J. Monaghan, 2009: Foehn winds in the McMurdo Dry Valleys of Antarctica. *AMS 10th Conference on Polar Meteorology and Oceanography*, Madison WI, May 2009.
- Steinhoff, D. F., S. Chaudhuri, and D. H. Bromwich, 2009: A case study of a Ross Ice Shelf Air Stream event: A new perspective. *AMS 10th Conference on Polar Meteorology and Oceanography*, Madison WI, May 2009.
- Steinhoff, D. F., D. H. Bromwich, and R. L. Fogt, 2008: Cyclogenesis near the Adélie Coast and influence of the low-level wind regime. *Third Antarctic Meteorological Observation, Modeling, and Forecasting Workshop*, Madison WI, June 2008.
- Steinhoff, D. F., D. H. Bromwich, and R. L. Fogt, 2008: Cyclogenesis near the Adélie Coast and influence of the low-level wind regime. *Byrd Polar Research Center weekly seminar*, The Ohio State University, Columbus OH, May 2008.
- Steinhoff, D. F. and D. H. Bromwich, 2008: Developing coastal cyclones and surface mass balance over Adélie Land and Wilkes Land Antarctica. *Center for Remote Sensing of Ice Sheets (CREGIS)*, Lawrence KS, March 2008.
- Steinhoff, D. F., D. H. Bromwich, A. J. Monaghan, and R. L. Fogt, 2007: Factors responsible for cyclogenesis in the Adélie Land coastal region of Antarctica. *Monash Univ. (Australia) Earth Sciences department seminar*, Clayton, Victoria, Australia, September 2007.
- Steinhoff, D. F., D. H. Bromwich, and R. L. Fogt, 2007: The impact of the Adélie Land katabatic wind regime on coastal cyclogenesis. *International Union of Geodesy and Geophysics (IUGG) General Assembly*, Perugia, Italy, July 2007.
- Steinhoff, D. F., D. H. Bromwich, and R. L. Fogt, 2007: The impact of the Adélie Land katabatic wind regime on coastal cyclogenesis. *Second Antarctic Meteorological Observation, Modeling, and Forecasting Workshop*, Rome, Italy, June 2007.
- Steinhoff, D. F. and D. H. Bromwich, 2007: Evaluation of Williams Field Terminal Aerodrome Forecasts (TAFs) during the 2006-07 Field Season. *Second Antarctic Meteorological Observation, Modeling, and Forecasting Workshop*, Rome, Italy, June 2007.
- Steinhoff, D. F. and D. H. Bromwich, 2007: Preliminary upper-air verification of Polar WRF in AMPS. *Second Antarctic Meteorological Observation, Modeling, and Forecasting Workshop*, Rome, Italy, June 2007.
- Steinhoff, D. F., D. H. Bromwich, M. Lambertson, S. L. Knuth, and M. A. Lazzara, 2006: A dynamical investigation of the May 2004 McMurdo Antarctica severe wind event using AMPS. *Antarctic Meteorological Observation, Modeling, and Forecasting Workshop*, Boulder CO, June 2006.
- Steinhoff, D. F., D. H. Bromwich, and M. Lambertson, 2005: Extreme winds and rapid degeneration of the May 2004 McMurdo Antarctica storm: Analysis using the AMPS forecast model, AWS data, and MODIS data. *Antarctic Automatic Weather Station – Antarctic Mesoscale Prediction System – Antarctic Meteorological Research Center Joint Annual Meeting*, Columbus OH, June 2005.

- Steinhoff, D. F., D. H. Bromwich, and M. Lambertson, 2005: Extreme winds and rapid degeneration of the May 2004 McMurdo Antarctica storm: Analysis using the AMPS forecast model, AWS data, and MODIS data. *FORMOSAT-3/COSMIC Science Summer Camp*, Taipei, Taiwan, May 2005.

Workshops Attended

- Model for Prediction Across Scales (MPAS) Tutorial, NCAR, Boulder CO, September 2019.
- Weather Research and Forecasting Variational Data Assimilation (WRF-Var) Tutorial, NCAR, Boulder CO, July 2011.
- Weather Research and Forecasting (WRF) Tutorial, NCAR, Boulder CO, July 2008.
- FORMOSAT-3/COSMIC Science Summer Camp, Taipei, Taiwan, May 2005.

Field Work

- Hermosillo, Mexico, August 2014 (*Aedes aegypti* household sampling and surveys).
- Arua, Uganda, September 2013 (Human plague community outreach).
- Orizaba, Mexico, May 2013 and August 2013 (*Aedes aegypti* household sampling and surveys).
- Puebla, Mexico, July 2012 (*Aedes aegypti* household sampling and surveys).
- McMurdo Station, Antarctica, January - February 2009 (Working with forecasters).
- McMurdo Station, Antarctica, November - December 2006 (Working with forecasters).

Computer Skills

- Operating systems: Linux/UNIX, macOS, Windows
- Programming: FORTRAN 77/90, Perl, Python, C-shell scripting, Matlab, R
- Meteorological analysis: NCL, MET Tools, GEMPAK, McIDAS, GrADS
- Workflow: Rocoto, Docker, Git
- Numerical weather prediction: MPAS, WRF, MM5

Professional Memberships

- American Meteorological Society (AMS)
- American Geophysical Union (AGU)

Other

- Citizenship: United States of America
- Security Clearance: Secret
- Advisor: Dr. David Bromwich, The Ohio State University (M.S., Ph.D.)