Daniel S. Ward

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Interests

Interactions between humans and the environment, especially human impacts on global climate through changes in aerosol emissions from natural and anthropogenic systems. Numerical modeling of these systems on multiple scales.

Research Experience

Postdoctoral Associate — 2010-Present
Department of Earth and Atmospheric Sciences, Cornell University, Ithaca, NY

Graduate Research Assistant — 2004-2010
Department of Atmospheric Sciences, Colorado State University, Fort Collins, CO

Science Advisor — 2004-2006
COMET, University Corporation for Atmospheric Research, Boulder, CO

Undergraduate Research Assistant — 2002-2004
Northeast Regional Climate Center, Ithaca, NY

Education

Ph.D., Colorado State University (Atmospheric Science) — 2010

M.S., Colorado State University (Atmospheric Science) — 2006

B.S., *cum laude*, Cornell University (Atmospheric Science) — 2004

Awards and Service

DoE SciDAC program – Review panel member — 2014

IPCC AR5 – Contributing Author, Working Group I, Chapter 1 — 2013

Alumni Award for outstanding doctoral research, Colorado State University — 2010

Shrake-Culler Graduate Scholarship — 2008

COMET Fellowship, graduate research grant — 2004

Bosart Memorial Scholarship — 2003

Referee for the following journals: — 2010-2014

- J. Geophysical Research - Atmospheres
- J. Geophysical Research - Biogeosciences
- Atmospheric Environment
- Geophysical Research Letters
- J. Applied Meteorology and Climatology
- Atmospheric Research
- Environmental Science & Technology
- Hydrology and Earth System Sciences
- Global Change Biology
- Climatic Change
- Earth System Dynamics

Publications

-In review

D. S. Ward, Mahowald, N.: Global climate forcing from different categories of anthropogenic land use ascribed to local sources. In review, *Earth Sys. Dynam. Discuss.*

J. Brahney, Mahowald, N., **Ward, D. S.**, Ballantyne, A. P., Neff, J. C.: Atmospheric phosphorus pollution driving global alpine lake stoichiometry. In review, *Scientific Reports*.

-Refereed

(14) J. F. Kok, Mahowald, N. M., Albani, S., Fratini, G., Gillies, J. A., Ishizuka, M., Leys, J. F., Mikami, M., Park, M.-S., Park, S.-U., Van Pelt, R. S., **Ward, D. S.**, Zobeck, T. M.: Insights into the global dust cycle's climate sensitivity from an improved dust emission model. Accepted, *Atmos. Chem. Phys.*, 2014.

(13) D. S. Ward, Mahowald, N. M., Kloster, S.: Potential climate forcing of land use and land cover change. *Atmos. Chem. Phys.*, **14**, 12701-12724, 2014.

(12) D. S. Ward, Mahowald, N. M.: Contributions of developed and developing countries to global climate forcing and surface temperature change. *Environ. Res. Lett.*, **9**, 074008, 2014.

(11) N. M. Mahowald, Albani, S., Kok, J., Engelstader, S., Scanza, R., **Ward, D. S.**, Flanner, M.: The size distribution of desert dust and its impact on the Earth system. *Aeolian Res.*, **15**, 53-71, 2014.

(10) B. Foereid, **Ward, D. S.**, Mahowald, N., Paterson, E., Lehmann, J.: The sensitivity of carbon turnover in the Community Land Model to modified assumptions about soil processes. *Earth Syst. Dynam.*, **5**, 211-221, 2014.

(9) M. Migliavacca, Dosio, A., Camia, A., Houborg, R., Houston, T., Kaiser, N., Khabarov, N., Krasovskiy, A. A., Marcolla, B., San Miguel-Ayanz, J., **Ward, D. S.**, Cescatti, A.: Modeling biomass burning and related carbon emissions during the 21st century in Europe, *J. Geophys. Res.-Biogeosci.*, **118**, 1732-1747, 2013.

(8) N. G. Heavens, **Ward, D. S.**, Mahowald, N. M.: Studying and projecting climate change with Earth System models, *Nature Education Knowledge*, **4**(5):4, 2013.

(7) M. Migliavacca, Dosio, A., Kloster, S., **Ward, D. S.,** Camia, A., Houborg, R., Durrant, T. Houston, Khabarov, N., Krasovskiy, A. A., San Miguel-Ayanz, J., and Cescatti, A.: Modeling burned area in Europe with the Community Land Model, *J. Geophys. Res.-Biogeosci*, **118**, 265-279, doi:10.1002/jgrg.20026, 2013.

(6) F. Li, Levis, S., **Ward, D. S.**: Quantifying the role of fire in the Earth system. Part I: Improved global fire modeling in the Community Earth System Model (CESM1), *Biogeosci*, **10**, 2293-2314, doi:10.5194/bg-10-2293-2013, 2013.

(5) D. S. Ward, S. Kloster, B. Rogers, N. M. Mahowald, J. T. Randerson, and P. Hess: The changing radiative forcing of fires; Global model estimates for past, present and future, *Atmos. Chem. Phys.*, **12**, 10857-10886, doi:10.5194/acp-12-10857-2012, 2012.

(4) N.M. Mahowald, **Ward, D. S.**, Kloster, S., Flanner, M.G., Heald, C.L., Heavens, N.G., Hess, P.G., and Lamarque, J.-F.: Aerosol impacts on climate and biogeochemistry, *Annual Review of Environment and Resources*, **36**, 45-74, doi:10.1146/annurev-environ-042009-094507, 2011.

(3) D. S. Ward, and Cotton, W. R.: Cold and transition season cloud condensation nuclei measurements in western Colorado, *Atmos. Chem. Phys.*, **11**, 4303-4317, 2011.

(2) D. S. Ward, and Cotton, W. R.: A method for forecasting cloud condensation nuclei using predictions of aerosol physical and chemical properties from WRF/Chem, *J. Appl. Meteor. Climat.*, **50** (7), 1601-1615, 2011.

(1) D. S. Ward, Eidhammer, T., Cotton, W. R., and Kreidenweis, S. M.: The role of the particle size distribution in assessing aerosol composition effects on simulated droplet activation, *Atmos. Chem. Phys.*, **10**, 5435-5447, 2010.

-Non-refereed

Dills, P., and **D. S. Ward** (2008), principal science advisors, Microwave remote sensing: land and ocean surface applications, *COMET program*, http://www.meted.ucar.edu/npoess/microwave_topics/land_ocean/

Teaching

Certificate in College Teaching, Colorado State University 2010

Laboratory Instructor, Colorado State University 2005-2008
Daily Weather Laboratory (ATS 540)

Teaching Assistant, Cornell University 2003-2004
Synoptic Meteorology (EAS 3520)
FORTRAN Programming (EAS 2900)

Guest lectures and class discussions:
Climate Dynamics (EAS 3050), Cornell University 2010, 2011, 2012, 2014
Topics in Computational Sustainability (CS 6702), Cornell University 2013
Cross-scales Biogeochemistry Modeling (EAS/BEE 4940), Cornell University 2013
Global Change and Atmospheric Chemistry (BEE 4800), Cornell University 2012
Climate Change Seminar (EAS 4400), Cornell University 2012
Physical Meteorology (EAS 4470), Cornell University 2011
Cloud Dynamics (ATS 712), Colorado State University 2009

Seminars and Invited Talks

Identifying the sources of anthropogenic climate change using global models 2014
Cornell University, Ithaca, NY (November 4, invited)
Geophysical Fluid Dynamics Laboratory, Princeton, NJ (September 24, invited)
ExxonMobil Corporate Strategic Research, Annandale, NJ (September 10, invited)

Global radiative forcing of land use and land cover change activities 2014
Experimental Design for CMIP6: Land Use MIP, Aspen, CO (August 5, invited)

The potential climate forcing of land use and land cover change 2014
19th Annual CESM Workshop, Breckenridge, CO (June 18)

Improved regional and decadal predictions of the carbon cycle 2014
EaSM PI meeting, Washington, D.C., (January 27)

Quantifying the climate impacts of fires and land use using global models 2012
Plymouth State University, (November 29, invited)

Aerosol impacts on climate and biogeochemical cycles 2012
Goldschmidt Conference, Montreal (June 28, session keynote speaker)

The changing radiative forcing of fires 2012
Cornell University, Biogeochemistry Environmental Sciences and Sustainability Seminar Series (February 24, invited)

The changing radiative forcing of fires; Model estimates for past, present and future 2012
American Meteorological Society Annual Meeting, New Orleans (January 25)

The role of aerosol chemistry in cloud microphysics at a high elevation site in Colorado 2011
Plymouth State University (April 14, invited)

The role of the particle size distribution in assessing aerosol composition effects on simulated droplet activation 2010
Colorado State University, Alumni Award Presentation (May 6, invited)