

Ian N. Williams

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Research Interests

Land-atmosphere interactions, Earth system modeling, water and carbon cycles, climate sensitivity and feedback, cloud and precipitation processes, climate dynamics

Education

University of Chicago, Chicago, IL

Ph.D., Geophysical Sciences, March 2012

Thesis Title: Tropical convection and climate sensitivity

Advisor: Raymond Pierrehumbert

Cornell University, Ithaca, NY

M.S., Atmospheric Science, December 2007

Minor Concentration: Environmental Fluid Mechanics

Thesis Title: Characteristics of baroclinic wave packets over the North Atlantic during strong and weak stratospheric polar vortex events

Advisor: Stephen Colucci

Cornell University, Ithaca, NY

B.S., Atmospheric Science, May 2005

Advisor: Art DeGaetano

Professional Experience

Research Scientist, Lawrence Berkeley National Laboratory (2016-current)

Postdoctoral Scholar, Lawrence Berkeley National Laboratory

Climate and Ecosystem Sciences Division (2012-2016)

Advisor: Margaret Torn

Graduate Research Assistant, University of Chicago,

Department of Geophysical Sciences (2008-2011)

Student Research Assistant, Lawrence Berkeley National Laboratory, (Summer 2006, 2009)

Summer Undergraduate Laboratory Internship (SULI),

Lawrence Berkeley National Laboratory (Summer 2005)

Meteorologist Intern, National Weather Service,

Regional Climate Services, Kansas City, MO (2004)

Teaching Experience

University of Chicago, Department of Geophysical Sciences

- Section Lead: Introduction to Global Warming (2009, 2011)
- Introduction to Geophysical Fluid Dynamics (graduate-level; 2010, 2011)
- Physics of the Earth (2010)
- Introduction to the Atmosphere (2006)

Institute for Genomic Diversity, Cornell University (2003)

- Developed K-12 classroom presentations with Theresa Fulton, as outreach for the NSF grant “Genetic Architecture of Maize and Teosinte”

Publications

Williams, I.N., Y. Lu, L.M. Kueppers, W.J. Riley, S.C. Biraud, J.E. Bagley, M.S. Torn (2016), Land-atmosphere coupling and climate prediction over the U.S. Southern Great Plains, *JGR-Atmospheres* (accepted).

Williams, I.N., W.J. Riley, L.M. Kueppers, M.S. Torn, and S.C. Biraud (2016), Separating the effects of phenology and diffuse radiation on gross primary productivity in winter wheat, *JGR-Biogeosciences*, doi:10.1002/2015JG003317.

Williams, I.N. and M.S. Torn (2015), Vegetation controls on surface heat flux partitioning, and land-atmosphere coupling, *Geophysical Research Letters*, 42, doi:10.1002/2015GL066305.

Williams, I.N., M.S. Torn, W.J. Riley, and M.F. Wehner (2014), Impacts of climate extremes on gross primary production under global warming, *Environmental Research Letters*, 9 (9), 094011.

Williams, I.N., W.J. Riley, M.S. Torn, S.C. Biraud, and M.L Fischer (2013), Biases in regional carbon budgets from covariation of surface fluxes and weather in transport model inversions, *Atmospheric Chemistry and Physics*, 14 (3), 1571-1585.

Williams, I.N., W.J. Riley, M.S. Torn, J.A. Berry, and S.C. Biraud (2011), Using boundary layer equilibrium to reduce uncertainties in transport models and CO₂ flux inversions, *Atmospheric Chemistry and Physics*, 11, 9631-9641, doi:10.5194/acp-11-9631-2011.

Williams, I.N. and S.J. Colucci (2010), Characteristics of baroclinic wave packets during strong and weak stratospheric polar vortex events, *Journal of the Atmospheric Sciences*, 67(10), 3190-3207.

Williams, I.N., R.T. Pierrehumbert, and M. Huber (2009), Global warming, convective threshold and false thermostats, *Geophysical Research Letters*, 36.

doi:10.1029/2009GL03984.

Publications under review and submitted

Lu, Y., I.N. Williams, J.E. Bagley, M.S. Torn, L.M. Kueppers (under review), Development of a winter wheat model in CLM4.5.

Williams, I.N. and R.T. Pierrehumbert (submitted), Observational evidence against stabilizing tropical cloud feedbacks.

Williams, I.N. and R.T. Pierrehumbert (submitted), Precipitation sensitivity to climate change: Energetic constraints and degrees of freedom.

Selected presentations

Williams, I.N., Y. Lu, J.E. Bagley, L.M. Kueppers, S.C. Biraud, and M.S. Torn (2016), Land-atmosphere coupling and climate prediction over the U.S. Southern Great Plains, American Meteorological Society, June 20, Salt Lake City, UT. (talk)

Williams, I.N., W.J. Riley, L.M. Kueppers, M.S. Torn, and S.C. Biraud (2016), Separating the effects of phenology and diffuse radiation on gross primary productivity in winter wheat, American Meteorological Society, June 21, Salt Lake City, UT. (talk)

Williams, I.N., and M.S. Torn (2016), Land-atmosphere coupling and climate prediction over the U.S. Southern Great Plains, Atmospheric System Research Science Team Meeting, May 2-5, Vienna, VA. (poster)

Williams, I.N., and M.S. Torn (2015), Surface turbulent heat flux partitioning and warm-season boundary layer clouds, Atmospheric System Research Science Team Meeting, March 16-20, Vienna, VA. (poster)

Williams, I.N., and M.S. Torn (2014), The roles of soil moisture and vegetation in surface turbulent flux partitioning, Atmospheric System Research Fall Working Group Meeting, November 20, Bethesda, MD. (talk)

Williams, I.N., M.S. Torn, W.J. Riley, M.F. Wehner, and W. Collins (2013), Climate extremes and ecosystem productivity in global warming simulations, American Geophysical Union, December 9-12, San Francisco, CA. (talk)

Williams, I.N., M.S. Torn, and W.J. Riley (2013), Clouds, aerosols, and the water and carbon cycles over the Southern Great Plains, Atmospheric System Research Science Team Meeting, March 18-21, Potomac, MD. (poster)

Williams, I.N., W.J. Riley, M.S. Torn, S.C. Biraud, M.L. Fischer, and J.A. Berry (2012), A Stochastic method to evaluate carbon cycle and atmospheric transport models using atmospheric observations, Third Atmospheric System Research Science

Team Meeting, March 12-16, Arlington, VA. (poster)

Williams, I.N., W.J. Riley, M.S. Torn, J.A. Berry, and S.C. Biraud (2011), Challenges in constraining surface trace gas exchanges from observations, American Geophysical Union, December 5-9, San Francisco, CA. (talk)

Williams, I.N., W.J. Riley, M.S. Torn, J.A. Berry, and S.C. Biraud (2010), Using boundary layer equilibrium to reduce uncertainties in CO₂ flux inversions, American Geophysical Union, December 13-17, San Francisco, CA. (poster)

Williams I.N., W.J. Riley, J.A. Berry, M.S. Torn, and S.C. Biraud (2009), Boundary Layer CO₂ budgets at long timescales, American Geophysical Union, December 14-18, San Francisco, CA. (poster)

Williams, I.N. and S.J. Colucci (2009), Characteristics of baroclinic wave packets over the North Atlantic during strong and weak polar vortex events, 17th Conference on Atmospheric and Oceanic Fluid Dynamics, June 8-12, Stowe, VT. (talk)

Williams, I.N. and S.J. Colucci (2007), Stratosphere-troposphere coupling in east-coast winter storms, 16th Conference on Atmospheric and Oceanic Fluid Dynamics, June 24-29, Santa Fe, NM. (poster)

Williams, I.N., W.J. Riley, J.A. Berry, M.S. Torn, and M.L. Fischer (2007), A one-dimensional study of cumulus convection in the diurnal and seasonal atmospheric CO₂ budgets over the Southern Great Plains, The U.S. North American Carbon Program (NACP) Investigators Meeting, January 22-26, Colorado Springs, CO. (poster)

Williams, I.N., W.J. Riley, J.A. Berry, M.S. Torn, and M.L. Fischer (2006), Regional scale surface CO₂ exchange estimates using a boundary layer budget method over the Southern Great Plains, Sixteenth Atmospheric Radiation Measurement (ARM) Science Team Meeting, March 27-31, Albuquerque, NM. (poster)

Memberships

American Geophysical Union

American Meteorological Society