

## GALEN A. MCKINLEY

University of Wisconsin - Madison  
Department of Atmospheric and Oceanic Sciences  
1225 W. Dayton St. Madison, WI 53706 USA  
608 262 4817 (phone) 608 262 0166 (fax)  
galen@aos.wisc.edu  
<http://www.aos.wisc.edu/~galen>

### EDUCATION

- June 2002 **Massachusetts Institute of Technology** Cambridge, MA  
*Ph.D. Climate Physics and Chemistry*  
Thesis: *Interannual Variability of Air-Sea Fluxes of Carbon Dioxide and Oxygen*
- May 1995 **Rice University** Houston, TX  
*B.S. Civil Engineering with Environmental Option*

### RESEARCH AND PROFESSIONAL EXPERIENCE

- June 2004 **University of Wisconsin - Madison** Madison, WI  
to present *Assistant Professor of Atmospheric and Oceanic Sciences*  
I study the coupling of physics and biogeochemistry in the ocean in order to better understand and quantify the marine carbon cycle. I am particularly interested in variability of air-sea carbon and oxygen fluxes on seasonal to decadal timescales, quantification of carbon sinks, and ocean biogeochemical modeling.
- August 2003 **University of Wisconsin - Madison / Princeton University** Princeton, NJ  
to May 2004 *Anna Julia Cooper Postdoctoral Fellow / Visiting Research Staff*  
Studied Ar and N<sub>2</sub> in an ocean and atmospheric models; considered bomb <sup>14</sup>C invasion rates using inverse techniques; and continued work on interannual variability of air-sea CO<sub>2</sub> and O<sub>2</sub> fluxes.
- September 2002 **Instituto Nacional de Ecología (National Institute of Ecology)** Mexico City, Mexico  
to August 2003 *Consultant*  
Analyzed potential public health co-benefits from the simultaneous control of air pollutant and greenhouse gas emissions in Mexico City; capacity building for integrated environmental protection.
- May 2002 to **Massachusetts Institute of Technology** Cambridge, MA  
August 2002 *Postdoctoral associate*  
Extended thesis work and developed collaborations for continuing projects.
- September 1996 *Research assistant*  
to May 2002 Studied the impacts of physical variability on ocean biogeochemical cycles, particularly air - sea fluxes of CO<sub>2</sub> and O<sub>2</sub>, using ocean general circulation models. Made preliminary estimates of the impact on air-sea tracer fluxes of the assimilation of sea-surface height data into an ocean model.
- June 1995 **Brown and Root Environmental** Houston, TX  
to July 1996 *Environmental specialist*  
Assisted industrial clients with environmental compliance; duties included water and soil sampling, hazardous waste abatement, and air pollution modeling.
- Summer 1993 **Clivius Multrum, USA** Newton, MA  
*Project consultant*

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### PUBLICATIONS

McKinley, G.A., T. Takahashi, E. Buitenhuis, F. Chai, J. R. Christian, S. C. Doney, C. Le Quere, I. Lima, R. Murtugudde, L. Shi, P. Wetzel (2005) North Pacific carbon cycle response to climate variability on seasonal to decadal timescales. submitted to *J. Geophys. Res.*

McKinley, G.A., M. Zuk, M. Höjer, M. Avalos, I. Gonzalez, R. Iniestra, I. Laguna, M.A. Martinez, P. Osnaya, and J. Martinez. (2005). Quantification of local and global benefits from air pollution control in Mexico City. *Envi. Sci. Technol.* 39, 1954-1961 (doi:10.1021/es035183e).

Peylin, P., P. Bousquet, C. LeQuere, S. Sitch, P. Friedlingstein, G.A. McKinley, N. Gruber, P. Rayner and P. Ciais. (2005). Multiple constraints of regional CO<sub>2</sub> flux variations over land and oceans. *Global Biogeochem. Cycles*. 18, GB1011, doi: 10.1029/2003GB002214.

McKinley, G.A., C. Rödenbeck, M. Gloor, S. Houweling and M. Heimann (2004) Pacific dominance to global air-sea CO<sub>2</sub> flux variability: A novel atmospheric inversion agrees with ocean models. *Geophys. Res. Lett.*, 31, L22308, doi: 10.1029/2004GL021069.

McKinley, G.A., M. J. Follows, and J. Marshall. (2004) Mechanisms of CO<sub>2</sub> air-sea flux variability in the Equatorial Pacific and North Atlantic with implications for atmospheric inversions. *Global Biogeochem. Cycles*, 18, GB2011, doi:10.1029/2003GB002179.

McKinley, G.A., M. J. Follows, J. Marshall, and S. Fan. (2003) Interannual variability of air-sea O<sub>2</sub> fluxes and the determination of CO<sub>2</sub> sinks using atmospheric O<sub>2</sub>/N<sub>2</sub>. *Geophys. Res. Lett.* 30(3), 1101, doi: 10.1029/2002GL016044.

Battle, M., M. Bender, M.B. Hendricks, D.T. Ho, R. Mika, G.A. McKinley, S. Fan, T. Blaine, and R. Keeling. (2003) Measurements and models of the atmospheric Ar/N<sub>2</sub> ratio. *Geophys. Res. Lett.*, 30(15), 1786, doi:10.1029/2003GL017411.

McKinley, G.A., M. J. Follows, and J. Marshall. (2000) Interannual variability of the air-sea flux of oxygen in the North Atlantic. *Geophys. Res. Lett.* 27, 2933-2936.

### SELECTED PRESENTATIONS

- September 2005 **Seventh International Carbon Dioxide Conference**, Broomfield, CO  
Plenary talk, "Pacific dominance to global air-sea CO<sub>2</sub> flux variability"
- August 2005 **Ocean Carbon Cycle and Climate Change Workshop**, Woods Hole, MA  
Poster "North Pacific carbon cycle response to climate variability on seasonal to decadal timescales"
- March 2005 **The Pennsylvania State University**, State College, PA  
Invited colloquium talk, "CO<sub>2</sub> air-sea flux variability: Ocean models and atmospheric inversions"
- December 2004 **American Geophysical Union, Fall Meeting**, San Francisco, CA  
Poster, "Testing ocean models with argon and nitrogen"
- October 2004 **SOLAS Science 2004**, Halifax, Canada  
Poster, "Atmospheric Ar/N<sub>2</sub>: A Tool for Constraining Atmosphere and Ocean Models"
- June 2004 **NOAA GCC Workshop: Understanding North Pacific Carbon-cycle Changes**, Seattle WA  
Invited plenary talk, "Modeled North Pacific carbon cycle variability"
- May 2004 **Geophysical Fluid Dynamics Laboratory**, Princeton, NJ  
Talk, "CO<sub>2</sub> air-sea flux variability: Ocean models and atmospheric inversions"
- December 2003 **American Geophysical Union, Fall Meeting**, San Francisco, CA  
Talk, "Local and global benefits of air pollution control in Mexico City"
- May 2003 **JGOFS Open Science Conference**, Washington, DC  
Poster, "Mechanisms of CO<sub>2</sub> air-sea flux variability in the North Atlantic and Equatorial Pacific"
- July 2002 **Princeton University, Atmosphere and Ocean Sciences Program**, Princeton, NJ  
Talk, "Interannual variability of air-sea fluxes of carbon dioxide and oxygen"
- February 2000 **American Geophysical Union, Ocean Sciences**, San Antonio, TX  
Talk, "Interannual variability of the air-sea flux of oxygen in the North Atlantic"

## GALEN A. MCKINLEY

### AWARDS AND HONORS

- 2003 - 2004 Anna Julia Cooper Postdoctoral Fellow, from University of Wisconsin - Madison  
1999 - 2002 Earth System Science Fellowship, NASA  
2000 - 2001 Martin Fellow for Sustainability, MIT  
1999 Teaching Assistant Prize, MIT Department of Earth, Atmospheric and Planetary Science

### PROFESSIONAL AND SERVICE ACTIVITIES

- since July 2005 **Ocean Carbon Cycle and Climate Change Scientific Steering Group (OCCC-SSG)**  
September 2005 **North American Coastal Margins: The Coastal CO<sub>2</sub> workshop**, Boulder, CO  
Invited participant and session leader  
November 2004 **UW System Women & Science, Opening Workshop for STEM Faculty**, Wisconsin Dells, WI  
Participant  
June 2004 **NOAA GCC Workshop: Understanding North Pacific Carbon-cycle Changes**, Seattle WA  
Invited speaker and participant  
June 2004 **UCAR/NCAR Junior Faculty Forum on Future Scientific Directions**, Boulder, CO  
Co-organizer and co-chair for “The role of coastal zones in global biogeochemical cycles”  
December 2003 **American Geophysical Union Fall Meeting**, San Francisco, CA  
Co-convenor and session chair for Union session: “Health, Air Pollution and Climate”  
March 2003 **Dissertations Initiative for the Advancement of Climate Change Research**, Guanica, PR  
Participated in a one-week symposium for recent PhDs in climate change.  
May 2002 **Carbon Cycle Data Assimilation Institute**, Boulder, CO  
Participated in the design of an optimal global CO<sub>2</sub> measurement network.  
June 2001 **American Meteorological Society Summer Policy Colloquium**, Washington, DC  
Attended a 10-day symposium introducing scientists to the US policy-making process.  
January 1999 **JGOFS Training Course on Biogeochemical Modeling of the Ocean**, Bangalore, India  
Participated in a two-week workshop on ocean biogeochemical modeling.

### TEACHING AND ADVISING

- University of Wisconsin at Madison** Madison, WI  
Fall 2004, 2005 *Global Climate Processes (AOS 425)*  
Course for senior undergraduates and graduate students covering global energy balance, boundary layers, general circulation of the atmosphere and ocean, carbon cycle, natural variability, climate modeling, and global change.  
Spring 2005 *Dynamics of the Atmosphere and Ocean II (AOS 311)*  
Course for junior undergraduates on the intermediate geophysical fluid dynamics. Basic equations of motion and key balances, thermal wind, vorticity, frictional effects, and basic wave concepts.  
Spring 2005 *Senior Capstone Seminar (AOS 405)*  
Seminar to introduce graduating seniors to current research in atmospheric and oceanic sciences  
**Massachusetts Institute of Technology** Cambridge, MA  
February 1998 *Graduate resident tutor, Bexley Hall*  
to August 2002 Lived with undergraduates, provided informal academic advising, and mediated interpersonal issues.  
Fall 1999 and *Teaching Assistant for “Physics of the Fluid Earth”* (Professors Alan Plumb and John Marshall)  
Fall 2000 Course covered the physics and dynamics of the general circulation of the atmosphere and the ocean. Performed laboratory demonstrations using a rotating table, organized and instructed regular review sessions, assisted with lecturing and graded.