

Geoffrey Gebbie

Research Associate, Harvard University
Visiting Scientist, Massachusetts Institute of Technology
24 Oxford St., Cambridge, MA 02138 USA
Phone: 617-495-4865
email: gebbie@eps.harvard.edu
URL: <http://www.seas.harvard.edu/climate/gebbie>

EDUCATION

Ph.D., Physical Oceanography, **Massachusetts Institute of Technology / Woods Hole Oceanographic Institution**, Cambridge, MA, 2004.

Thesis: *Subduction in an Eddy-Resolving State Estimate of the Northeast Atlantic Ocean*.
Advisor: Carl Wunsch. Co-Advisor: Patrick Heimbach.

B.S., Atmospheric Sciences, *Magna Cum Laude*, **University of California, Los Angeles**, Los Angeles, CA, 1997.

RESEARCH INTERESTS

Past ocean circulation and its role in paleoclimate, studied through the combination of physical models and geochemical data. Global and large-scale coupled atmosphere-ocean dynamics, with focus on ENSO. Analysis of climate variability through data assimilation, especially the synthesis of general circulation models and observations.

PROFESSIONAL EXPERIENCE

Research Associate, **Harvard University**, Cambridge, MA, 2007-present.

Visiting Scientist, **Massachusetts Institute of Technology**, Cambridge, MA, 2007-present.

Course Scientist, **American Museum of Natural History**, instructor for the “Ocean System” class, New York, NY, 2008.

Postdoctoral Fellow, **Harvard University**, Climate Dynamics Group, Cambridge, MA, 2004-2007.

Research Assistant, **Estimating the Circulation and Climate of the Ocean (ECCO) Consortium**, Massachusetts Institute of Technology, 1998-2004, with continued involvement until present.

High School Physics Teacher, **Harvey Mudd College**, Upward Bound college preparation program, Claremont, CA, 1997.

Math and Physics Tutor, **University of California, Los Angeles**, College of Letters and Science Tutorial Center, Los Angeles, CA, 1995-1997.

AWARDS AND GRANTS

National Oceanographic Partnership Program (NOPP/NASA) Grant, "Variability and Forcing Mechanisms of the Atlantic Meridional Overturning Circulation." Co-Investigator with Dr. Tony Lee, Jet Propulsion Laboratory, Supported for 2008-2010.

National Center for Atmospheric Research (NCAR) Large Request for Computing Resources, "Estimating the Ocean Circulation of the Last Glacial Maximum." Requesting Scientist/Lead User, Supported for 2007-2010.

Jet Propulsion Laboratory Contract, "Modular Ocean Model Version 4: Adjoint Development." Authored proposal and secured funding with Eli Tziperman, 2006-2008.

NASA Earth System Science Fellow, 2000-2003

National Partnership for Advanced Computational Infrastructure (NPACI) Resource Allocation Grant, "Estimation of the time evolving ocean general circulation." Collaboration with Carl Wunsch and the San Diego Supercomputer Center, 2002-2003.

Outstanding Student Paper, American Geophysical Union Fall Meeting, 2002

Outstanding Student Poster, World Ocean Circulation Experiment Meeting, 2002

TECHNICAL EXPERIENCE

High Performance and Parallel Computing: MPI, OpenMP

IBM, SGI, and Linux Supercomputers

Linux/UNIX system administration, FORTRAN 77/90/95/2000

Automatic Differentiation of Numerical Code

PUBLICATIONS

Gebbie, G., and E. Tziperman, "Predictability of SST-modulated westerly wind bursts," submitted.

Gebbie, G., and E. Tziperman, "Incorporating a semi-stochastic model of ocean-modulated westerly wind bursts into an ENSO prediction model," *Theoretical and Applied Climatology*, in press, 2008.

Gebbie, G., I. Eisenman, A. Wittenberg, and E. Tziperman, "Modulation of Westerly Wind Bursts by Sea Surface Temperature: A Semi-Stochastic Feedback for ENSO," *J. Atmos. Sci.*, 64, 3281–3295, doi:10.1175/JAS4029.1, 2007.

Gebbie, G., "Does Eddy Subduction Matter in the Northeast Atlantic Ocean?" *J. Geophys. Res.*, 112, C06007, doi:10.1029/2006JC003568, 2007.

Huybers, P., G. Gebbie, and O. Marchal, "Can Paleoceanographic Tracers Constrain Meridional Circulation Rates?" *J. Phys. Oceanogr.*, 37 (2), 394–407, doi:10.1175/JPO3018.1, 2007.

Gebbie, G., and P. Huybers, "Meridional Circulation During the Last Glacial Maximum

Explored Through a Combination of $\delta^{18}\text{O}$ Observations and a Geostrophic Inverse Model,” *Geochem. Geophys. Geosyst.*, 7, Q11N07, doi:10.1029/2006GC001383, 2006.

Gebbie, G., P. Heimbach, and C. Wunsch, “Strategies for Nested and Eddy-Permitting State Estimation,” *J. Geophys. Res.*, 111, C10073, doi:10.1029/2005JC003094, 2006.

NON PEER-REVIEWED PUBLICATIONS

Gebbie, G., I. Eisenman, A. Wittenberg, and E. Tziperman, “Could ocean modulated wind bursts lead to improved forecasts of El Niño?” *Bull. Amer. Meteor. Soc.*, 88 (9), Paper of Note, 2007.

Gebbie, G., and the ECCO-GODAE Group, “The MOM4 Tangent-Linear and Adjoint Project,” 2005.

Gebbie, G., “A Multi-Platform Parallel Computational Benchmark of the GFDL Modular Ocean Model Version 4 (MOM4),” 2005.

Gebbie, G., “Can an Eddy-Resolving General Circulation Model Adequately Represent the Labrador Sea Deep Convection Cycle?” Technical report, 2000.

PRESENTATIONS

Gebbie, G., and E. Tziperman, “The Impact of Ocean-modulated Wind Bursts on ENSO Prediction”, *SOLICITED* Presentation, **European Geophysical Union** Assembly, Vienna, Austria, 2007.

Gebbie, G., and P. Huybers, “What do paleo-density observations tell us about the overturning circulation of the Last Glacial Maximum?” *INVITED* presentations at: **Massachusetts Institute of Technology** Oceanography and Climate Sack Lunch Seminar, 2006, **Boston University**, Boston, MA, 2006, **American Geophysical Union** Fall Meeting, San Francisco, CA, 2006.

Gebbie, G., I. Eisenman, A. Wittenberg, and E. Tziperman, “Westerly Wind Burst Modulation by the Ocean as an Intrinsic Part of ENSO Dynamics”, **American Geophysical Union** Fall Meeting, San Francisco, CA, 2005, **European Geophysical Union** Assembly, Vienna, Austria, 2005.

Gebbie, G., “Estimates of Eddy Subduction in the Northeast Atlantic Ocean.” **Bjerknes Centenary**, Bergen, Norway, 2004, **Climate Variability (CLIVAR)** Conference, Baltimore, MD, 2004, **American Geophysical Union** Ocean Sciences Meeting, Portland, OR, 2004, **U. Massachusetts Dartmouth**, New Bedford, MA, 2004.

Gebbie, G., C. Wunsch, and P. Heimbach, “An Eddy-Resolving State Estimate of the Ocean Circulation During the Subduction Experiment Using a North Atlantic Regional Model.” **American Geophysical Union** Fall Meeting, San Francisco, CA, 2002, **World Ocean Circulation Experiment** Meeting, San Antonio, TX, 2002.

Gebbie, G., C. Hill, P. Heimbach, and C. Wunsch, “Combining Observations and Simulation in a Fully Eddy-Resolving North Atlantic Regional Model.” **American Geophysical Union** Ocean Sciences Meeting, Honolulu, HI, Feb. 2002.

Gebbie, G., D. Stammer, J. Sheinbaum, and C. Wunsch “Can an Eddy-Resolving Ocean General Circulation Model Adequately Represent the 1996-97 Labrador Sea Deep Convection Cycle?” **Labrador Sea Deep Ocean Convection** Workshop, Toronto, Canada, 2000.

PROFESSIONAL AFFILIATIONS AND SERVICE

Adjoint Modeling Workshop Leader, Harvard University, 2005

Convener of American Geophysical Union Fall Meeting Session, “General physical oceanography,” 2005

R/V Oceanus Cruise 369–Reykjavik to Reykjavik, R. Pickart (Chief Scientist), 2001

Reviewer for *J. Geophys. Res.*, *Geophys. Res. Lett.*, and *Clim. Dyn.*

Member, American Geophysical Union, Phi Beta Kappa, Golden Key National Honor Society

Cambridge, MA, September 2, 2008