

CURRICULUM VITAE

Nicole S. Lovenduski

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Education

Ph.D. Atmospheric and Oceanic Sciences, University of California at Los Angeles, 2007.

M.S. Atmospheric and Oceanic Sciences, University of California at Los Angeles, 2003.

B.A. Earth and Planetary Sciences, Washington University in St. Louis, 2001.

Professional Experience

Assistant Professor, Department of Atmospheric and Oceanic Sciences, University of Colorado at Boulder, 2010-current.

Fellow, Institute of Arctic and Alpine Research, University of Colorado at Boulder, 2010-current.

Postdoctoral Research Fellow, Department of Atmospheric Science, Colorado State University, 2007-2009.

Graduate Student Researcher, Institute of Geophysics and Planetary Physics, Univ. of California, Los Angeles, 2002-2007.

Fellowships and Awards

NOAA Climate and Global Change Postdoctoral Fellowship, 2007-2009.

Bjerknes Memorial Award (outstanding research by a graduate student), UCLA, 2006.

NASA Graduate Student Fellowship in Earth System Science, 2005-2007.

Brian Lance Bosart Memorial Award (outstanding service contribution by a graduate student), UCLA, 2004.

Eugene Cota Robles Fellowship, University of California, 2001.

Funded Proposals

Lovenduski, N. S., 2012-2015: The variable and changing carbonate chemistry of the Southern Ocean. *NSF Chemical Oceanography*, \$453,752 total award.

Lovenduski, N. S., and C. Sweeney, 2012-2015: Drake Passage as a test bed for large-scale changes in Southern Ocean biogeochemistry. *NOAA Climate Program*, \$475,933 total award.

McKinley, G. A., and N. S. Lovenduski, 2011-2014: The impact of thermocline induction on decadal variability of the North Atlantic carbon sink. *NASA Carbon Cycle Science*, \$447,125 total award.

Ito, T., and N. S. Lovenduski, 2009-2012: Future changes of the Southern Ocean CO₂ fluxes. *NOAA Climate Program*, \$377,623 total award.

Ito, T., and N. S. Lovenduski, 2008-2011: High-resolution modeling of the Southern Ocean carbon cycle based on ECCO state estimates. *NASA Carbon Cycle Science*, \$418,340 total award.

Lovenduski, N. S., 2007-2009: Determining the future behavior of the Southern Ocean CO₂ sink. *NOAA Climate and Global Change Postdoctoral Fellowship*, \$112,000 total award.

Lovenduski, N. S., 2005-2007: Impact of the Southern Annular Mode on Southern Ocean circulation and biogeochemistry. *NASA Earth System Science Graduate Student Fellowship*, \$48,000 total award.

Invited Talks

Ocean Carbon and Biogeochemistry Summer Workshop, Woods Hole, MA, July 2011.

Ocean Ecologies and their Physical Habitats in a Changing Climate Workshop, Columbus, OH, June 2011.

Program on Climate Change, University of Washington, Seattle, WA, December 2010.

CLIVAR/CliC/SCAR Southern Ocean Region Implementation Panel Meeting, Southampton, England, June 2010.

AGU Ocean Sciences Meeting, Session IT54D, Portland, OR, February 2010.

New Frontiers in Southern Ocean Biogeochemistry and Ecosystem Research Workshop, Princeton, NJ, June 2009.

Division of Earth and Ocean Sciences, Duke University, Durham, NC, March 2009.

School of Earth and Atmospheric Sciences, Georgia Institute of Technology, Atlanta, GA, March 2009.

Dept. of Atmos. and Oceanic Sci. & Inst. of Arctic and Alpine Res., University of Colorado, Boulder, CO, March 2009.

AGU Fall Meeting, Session PP44B, San Francisco, CA, December 2008.

Rosenstiel School of Marine and Atmospheric Science, University of Miami, Miami, FL, November 2008.

NASA Jet Propulsion Laboratory, Pasadena, CA, October 2008.

Department of Environmental Science and Engineering, California Institute of Technology, Pasadena, CA, October 2008.

Lamont-Doherty Earth Observatory, Columbia University, Palisades, NY, July 2008.

Gordon Research Conference on Polar Marine Sciences, Ventura, CA, March 2007.

Dynamics and Impacts of the Southern Annular Mode Workshop, Adelaide, Australia, February 2007.

Academic Service*External*

CLIVAR Southern Ocean Region Implementation Panel: World Climate Research Programme, 2010-2014.

Polar Meteorology and Oceanography Committee, American Meteorological Society, 2010-2013.

Core Leader for Ocean Acidification Action Group: Scientific Commission for Antarctic Research, 2011-current.

Steering Committee: New Frontiers in Southern Ocean Biogeochemistry and Ecosystem Research Workshop, 2009.

Steering Committee: IPY-Oslo Science Conference 2010, Theme 1: Linkages between polar regions and global systems.

Convener: IPY-Oslo Science Conference 2010, The role of the polar oceans in global carbon cycling and acidification.

Convener: AGU Fall Meeting 2008, Ocean Carbon Cycle: Decadal Trends in the Global Ocean, Session OS24.

Reviewer: Biogeosciences, Deep-Sea Research II, Geophysical Research Letters, Global Biogeochemical Cycles, Journal of Climate, Nature, Remote Sensing of Environment, Science.

Panelist: National Oceanographic and Atmospheric Administration, National Science Foundation.

Internal

Program Director, Graduate Certificate in Oceanography, 2011-current.

Admissions Committee, Department of Atmospheric and Oceanic Sciences, 2010-current.

Computer/Information Center Committee, Institute of Arctic and Alpine Research, 2010-current.

Chair Nomination Committee, Department of Atmospheric and Oceanic Sciences, 2011.

Community

Guest Speaker and Panelist, Ocean acidification, Colorado Ocean Coalition, Boulder, CO, 2011.
 Mentor, Summer Multicultural Access to Research Training Program, CU Boulder, 2010-current.
 Speaker, The science and ethics of global warming, Trinity Lutheran Church, Boulder, CO, 2010.
 Guest, Marine Science podcast, St. Mary's High School, Englewood, CO, 2010.
 Panelist, Career Paths in Polar Research, Association of Polar Early Career Scientists, Boston, MA, 2011.
 Panelist, Career Paths in Atmospheric and Oceanic Sciences, University of Colorado, Boulder, CO, 2010.

Teaching Experience

Courses Taught, CU Boulder

ATOC 1060: Our Changing Environment, 3 credit hours, Spring 2012.
 ATOC/GEOL 3070: Introduction to Oceanography, 3 credit hours, Fall 2010, Fall 2011.
 ATOC 5900: Independent Study in Chemical Oceanography, 3 credit hours, Fall 2010.
 ATOC 6020: Oceanography Seminar, 1 credit hour, Fall 2011.
 ATOC 7500: The Global Carbon Cycle, 3 credit hours, Spring 2011.

Graduate student committees, member, CU Boulder

Scott Bachman, Ph.D. in progress, Atmospheric and Oceanic Sciences
 Patrick Boylan, Ph.D. in progress, Atmospheric and Oceanic Sciences
 Whitney Doss, Ph.D. in progress, Geological Sciences
 Alice DuVivier, Ph.D. in progress, Atmospheric and Oceanic Sciences
 Shelly Knuth, Ph.D. in progress, Atmospheric and Oceanic Sciences
 Fei Xing, Ph.D. in progress, Geological Sciences
 Stephen Yeager, Ph.D. in progress, Atmospheric and Oceanic Sciences
 Emily Zakem, M.S. 2011, Environmental Studies

Graduate student committees, member, external to CU Boulder

Daniel Jones, Ph.D. in progress, Atmospheric Science, Colorado State University

Undergraduate students advised, CU Boulder

Marvin Alfaro, Summer Multicultural Access to Research Training mentee, 2010
 Natalie Freeman, Summer Multicultural Access to Research Training mentee, 2011
 Andrew Margolin, Honors Thesis Student, B.A. expected 2012

PUBLICATIONS

In Preparation

- Lenton, A., B. Tilbrook, M. Alvarez, D. Bakker, M. Hoppema, C. LoMonaco, N. Lovenduski, R. Matear, B. McNeil, N. Metzl, P. Monteiro, and C. Sweeney, in preparation: Southern Ocean regional carbon cycle assessment, *Biogeosciences*.
- Lovenduski, N. S., T. Ito, and D. C. Jones, in preparation: Pre-industrial carbon in the eddying Southern Ocean. *Biogeosciences*.
- Lovenduski, N. S., M. C. Long, P. Gent, and K. Lindsay, in preparation: Multi-decadal trends in the advection and mixing of natural carbon in the Southern Ocean. *Geophysical Research Letters*.

In Review

- Sweeney, C., T. Takahashi, T. Guilderson, N. S. Lovenduski, T. Newberger, J. L. Sarmiento, R. M. Key, J. Majkut, K. Rodgers, and C. Le Quéré, in review: Evidence of increased vertical transport south of the Antarctic Polar Front. *Geophysical Research Letters*.
- Strutton, P. G., N. S. Lovenduski, M. Mongin, and R. Matear, in press: Quantification of Southern Ocean plankton biomass and primary productivity via satellite observations and biogeochemical models. *CCAMLR Science*.

2005 - 2011

- Jones, D. C., T. Ito, and N. S. Lovenduski, 2011: The transient response of the Southern Ocean pycnocline to changing atmospheric winds. *Geophysical Research Letters*, 38, L15604, doi:10.1029/2011GL048145.
- Lovenduski, N. S., and T. Ito, 2009: The future evolution of the Southern Ocean CO₂ sink. *Journal of Marine Research*, 67(5), 597-617, doi:10.1357/002224009791218832.
- Lovenduski, N. S., N. Gruber, and S. C. Doney, 2008: Toward a mechanistic understanding of the decadal trends in the Southern Ocean carbon sink. *Global Biogeochemical Cycles*, 22, GB3016, doi:10.1029/2007GB003139.
- Lovenduski, N. S., N. Gruber, S. C. Doney, and I. D. Lima, 2007: Enhanced CO₂ outgassing in the Southern Ocean from a positive phase of the Southern Annular Mode. *Global Biogeochemical Cycles*, 21, GB2026, doi:10.1029/2006GB002900.
- Lovenduski, N. S., and N. Gruber, 2005: Impact of the Southern Annular Mode on Southern Ocean circulation and biology. *Geophysical Research Letters*, 32, L11603, doi:10.1029/2005GL022727.
- Ehlmann, B. L., R. E. Arvidson, B. L. Jolliff, S. S. Johnson, B. Ebel, N. Lovenduski, J. D. Morris, J. A. Byers, N. O. Snider, and R. E. Criss, 2005: Hydrologic and Isotopic Modeling of Alpine Lake Waiau, Mauna Kea, Hawai'i. *Pacific Science*, 59(1), 1-15.

Non-peer reviewed

- Deutsch, C., E. Hoffman, T. Ito, N. Lovenduski, J. Russell, J. Sarmiento, W. Smith, and P. Strutton, 2010: A U.S. Southern Ocean Carbon, Ecosystems and Biogeochemistry Science Plan.
- Lovenduski, N.S., 2011: Climate variability and Southern Ocean carbon uptake, U.S. CLIVAR Variations, 9(3).