

Cynthia N. Cudaback, Ph.D.

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Education

B.A. Physics, with honors. University of California, Berkeley.

Ph.D. Geophysics. University of Washington, Seattle.

Dissertation: *The effect of vertical mixing on along-channel transport in a layered flow.*

Graduate coursework, marine and environmental education. U. of North Carolina, Wilmington.

Experience in Teaching and Educational Research

2009-present Informal marine and environmental educator

- develop, present and evaluate youth education programs in marine science and conservation; align programs with state science competency standards
- consult with educators to promote current, research-based pedagogical approaches to teaching in the sciences and advance understanding of current issues related to climate change
- employ storytelling as an instructional tool; create educational narratives that combine inspirational tales with scientific facts

2001-2008 College level introductory oceanography professor

- taught undergraduate oceanography courses; emphasized inquiry-based learning and stewardship
- developed and validated survey instrument to measure content knowledge and attitudes
- published research and developed web-based resources related to ocean literacy

Experience in Science and Environmental Policy

2005-2009 Lead PI, Pamlico Sound Oyster Larval Dispersal Study

- measured currents using both moored and drifting instruments
- predicted dispersal envelopes for oyster larvae from existing sanctuaries
- collaborated closely with NC Division of Marine Fisheries
- identified optimal location for a new oyster sanctuary

2002-2003 Co-Chair, Huntington Beach Contamination Study (Phase III) Review Panel

- organized review panel for study of bacterial transport near a sewage outfall
- presented findings to Orange County Sanitation District Board of Control
- reviewed, edited and published a related study article (Grant *et al.*)
- developed educational website for undergraduates on the role of science in policy

Employment History

2009-present Founder and President, *Ocean and You*, Raleigh, NC and Oakland, CA

2004-2008 Assistant Professor, North Carolina State University, Raleigh, NC

2000-2003 Post-graduate Researcher, University of California, Santa Barbara, CA

1998-1999 Post-graduate Researcher, Scripps Institution of Oceanography

1991-1998 Research Assistant, University of Washington Geophysics Program

1994 Summer Intern, Naval Undersea Warfare Center

1989-1991 Researcher, NOAA Pacific Marine Environmental Laboratory

1986-1991 NOAA Corps Officer, Atlantic and Pacific Oceans

1983-1985 Programmer, Max Planck Institute for Extraterrestrial Physics, Munich

Grants

2005 North Carolina Sea Grant, \$119,988

Oyster dispersal and meta-population dynamics in Pamlico Sound. Part 1: Dispersal

2005 North Carolina Sea Grant mini-grant \$4,550

Circulation near Oyster Sanctuaries in Pamlico Sound

2002 US Army Corps of Engineers, Portland District, \$84,909

Impacts of Maintenance Dredging at the Mouth of the Columbia River

Educational Publications

- Cudaback, C. N., 2010, *The State of Ocean Literacy among High School and College Students*, in revision for Journal of Geoscience Education.
- Cudaback, C. N., 2009, *Some observations on the Impacts of Marine Education*, Current, The Journal Of Marine Education, 25(2), pp34-35.
- Cudaback, C. N., 2008, *Ocean Literacy: There's more to it than Content*, Oceanography, 21(4).
- Cudaback, C. N., 2008, *Survey Instrument Validation: the First Commandment of Educational Research*, Chapter 1 in: College Science Teachers Guide to Assessment, a monograph published by the Society for College Science Teachers, Edited by Thomas Lord, Donald French and Linda Crow.
- Cudaback, C. N., 2007, Review of *Exploring the World Ocean*, by W. S. Chamberlain and T. D. Dickey, in Oceanography.
- Cudaback, C. N., 2006, *What do college students know about the ocean?* EOS: Transactions of the American Geophysical Union, 87(40).

Scientific Publications

- Cudaback, C. N., and E. McPhee-Shaw, 2008, *Diurnal Period Internal Waves in the Santa Barbara Channel*, Estuarine and Coastal Shelf Studies.
- Lin, J., H. Xu, C. Cudaback and D. Wang, 2007, *Inter-annual variability of hypoxic conditions in a shallow estuary*, Journal of Marine Systems, 73(1-2), pp 169-184, [doi:10.1016/j.jmarsys.2007.10.011](https://doi.org/10.1016/j.jmarsys.2007.10.011).
- Haase, A. T. and C. N. Cudaback and T. N. Carlson, 2007, *Development of the Watershed Evaluation Tool Using Remotely Sensed Data*, Pennsylvania Geographer.
- Grant, S. B., J. H. Kim, B. H. Jones, S. A. Jenkins, J. Wasyl, and C. N. Cudaback, 2005, *Surf zone entrainment, along-shore transport, and human health implications of pollution from tidal outlets*, Journal of Geophysical Research, 110 (C10025) [doi:10.1029/2004JC002401](https://doi.org/10.1029/2004JC002401).
- Cudaback, C. N., L. Washburn and E. Dever, 2005, *Inner-Shelf circulation near Point Conception, California*, Journal of Geophysical Research 110 (C7), [doi:10.1029/2004JC002608](https://doi.org/10.1029/2004JC002608).
- Jay, D. A., C. N. Cudaback and T. A. Chisholm, 2004, *Evaluation of impacts of maintenance dredging at the mouth of the Columbia River on plume salinity*, peer-reviewed report to the Army Corps of Engineers, Portland District.
- Lemus, J., and C. N. Cudaback, 2003, *Executive Summary of Review Panel Comments on the Huntington Beach Phase III Final Draft Report*, report to Orange County Sanitation District.
- Cudaback, C. N. and J. L. Largier, 2001, *The cross-shelf structure of wind- and buoyancy-driven circulation over the North Carolina inner shelf*, Continental Shelf Research, 21(15), pp 1649-1668.
- Cudaback, C. N. and D. A. Jay, 2001, *Tidal asymmetry in an estuarine pycnocline, 2, Transport*, J. Geophysical Research, 106(C2), pp 23,237-26,257.
- Cudaback, C. N. and D. A. Jay, 2000, *Tidal asymmetry in an estuarine pycnocline, 1, Depth and thickness*, J. Geophysical Research, 105(C11), pp 2,639-2,652.
- Cudaback, C. N., 1998, *The effect of vertical mixing on along-channel transport in a layered flow*, Ph. D. Thesis, University of Washington.
- Cudaback, C. N. and D. A. Jay, 1996, *Formation of the Columbia River plume -- hydraulic control in action?*, in: D. Aubrey(ed), Buoyancy effects on Coastal Dynamics, An AGU Coastal and Estuarine Sciences Monograph, pp 139-154.
- Lavelle, J. W., C. N. Cudaback, A. J. Paulson and J. A. Murray, 1991, *A rate for the scavenging of fine particles by macroaggregates in a deep estuary* Journal of Geophysical Research, 96(C1), pp783-790.
- Cudaback, C. N., A. J. Paulson and J. W. Lavelle, 1991, *A modeling study of the vertical distribution and transport of manganese in Puget Sound*, NOAA Technical Memorandum ERL PMEL-93, 27 pp.

Affiliations

National Science Teachers Association (NSTA), National Marine Educators Association (NMEA), Sigma Xi, the Scientific Research Society, American Geophysical Union (AGU)

Service & Volunteerism

Science Museums:

- volunteer docent, ambassador and educator at the Chabot Space & Science Center, Oakland, CA
- presented programs on marine diversity, buoyancy, and the seasons for the North Carolina Museum of Natural Sciences, Durham, NC
- taught climate change for science teachers at the North Carolina Museum of Life and Science, Raleigh NC

Storytelling:

- tell professionally at regional venues in North Carolina and California
- attend National Storytelling Festival every year
- study technique in workshops with national professional tellers

Elementary Schools

- provide free *Ocean and You* programs for needy schools and science events
- teach waste reduction and participate in eco-school committee
- coached Odyssey of the Mind primary grade team

Public Outreach:

- teach environmental mythbusting for adults at Montclair Presbyterian Church, Oakland, CA
- teach adults through NCSU's Encore program and the League of Women Voters
- presented research at NCSU Alumni College and NC Aquarium's Oyster Day

National Ocean Science Bowl:

- organized venue, volunteers, catering and giveaways for North Carolina Ocean Bowl
- served as moderator for Southern California Ocean Bowl