

## **Cumulative Bio-Bibliography**

Princeton University

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### **Bess B. Ward**

William J. Sinclair Professor of Geosciences

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#### **POSITIONS HELD**

- 2012-2013 Visiting Scientist (Sabbatical), Plymouth Marine Laboratory  
2007-2011 Visiting Scientist, Plymouth Marine Laboratory  
Plymouth UK, July – August  
2010-Present Trustee, Plymouth Marine Laboratory  
2006-Present Chair, Department of Geosciences  
Princeton University  
1998-Present Professor, Department of Geosciences, Princeton University  
2004 Visiting Scientist (Sabbatical), Plymouth Marine Laboratory  
Plymouth UK, January - August  
1995-1998 Chair, Ocean Sciences Department  
University of California, Santa Cruz  
1995-1998 Professor, Ocean Sciences Department  
University of California, Santa Cruz  
1991-1995 Associate Professor, Marine Sciences Department  
University of California, Santa Cruz  
1993 Visiting Scientist, Max Planck Institute für Limnologie  
Plön, Germany, October-December  
1989-1991 Assistant Professor of Marine Sciences  
University of California, Santa Cruz  
1984-1989 Assistant Research Oceanographer, Institute of Marine Resources,  
Scripps Institution of Oceanography, University of California, San Diego  
1987-1991 Associate Member, Center for Molecular Genetics,  
University of California, San Diego  
1987-1988 Chairperson, Food Chain Research Group, Scripps Institution of Oceanography,  
University of California, San Diego  
1982-1984 Postgraduate Research Biologist, Institute of Marine Resources,  
Scripps Institution of Oceanography, University of California, San Diego  
1976-1982 Graduate Research Assistant, Department of Oceanography,  
University of Washington, Seattle  
1980 Graduate Teaching Assistant, Friday Harbor Laboratories,  
(Summer) Department of Oceanography, University of Washington  
1977 Graduate Teaching Assistant, Department of Oceanography,  
(Fall) University of Washington

## EDUCATION

1982 Ph.D., Biological Oceanography, University of Washington, Seattle, WA  
1979 M.S., Biological Oceanography, University of Washington, Seattle, WA  
1978 Microbial Ecology Course, Marine Biological Laboratory, Woods Hole, MA  
1976 B.S., Zoology, Michigan State University, East Lansing, MI  
1971-72 Mathematics, Auburn University, Auburn, AL

## HONORS and AWARDS:

Distinguished Visiting Biologist, Woods Hole Oceanographic Institution, March 1996  
G. Evelyn Hutchinson Medal, American Society of Limnology and Oceanography, 1997  
Who's Who in American University Teachers, 1997  
Fellow of the American Academy of Microbiology, 1999  
Fellow of the American Geophysical Union, 2002  
Fellow of the American Academy of Arts and Sciences, 2004  
Proctor and Gamble Award, American Society for Microbiology, 2012  
Samuel A. Waxman Honorary Lectureship, Theobald Smith Society, 2014  
Rachel Carson Award Lecture, American Geophysical Union, 2014  
Chemical Oceanography H. Burr Steinbach Scholar of 2015 (WHOI)

## RESEARCH INTERESTS:

Marine and global nitrogen cycle, molecular and immunological probes to link marine phytoplankton, bacteria and microbial processes (especially nitrification and denitrification), oxygen minimum zones, phytoplankton nitrogen dynamics, microbial genomics

## PUBLICATIONS

### In Press

Bowen, J. L., Weisman, D., Yasuda, M., Jayakumar, A., Morrison, H. G. and Ward, B. B. Marine oxygen deficient zones harbor depauperate denitrifying communities compared to extensive novel genetic diversity in coastal sediments. *ISME Journal*  
Ji, Q., A. R. Babbin, X. Peng, J. L. Bowen and B. B. Ward. Nitrogen substrate dependent nitrous oxide cycling in salt marsh sediments. *Journal of Marine Research*  
Fawcett, S. E., B. B. Ward, M. W. Lomas, D. M. Sigman. Vertical decoupling of nitrate assimilation and nitrification in the Sargasso Sea. *Global Biogeochemical Cycles*

### Published

Babbin, A. R., D. Bianchi, A. Jayakumar, B. B. Ward. Rapid nitrous oxide cycling in the suboxic ocean. *Science* 348:1127-1129 (2015)

- Van Oostende, N. C., J. P. Dunne, S. E. Fawcett and B. B. Ward. Phytoplankton succession explains size partitioning of new production during upwelling blooms. *Journal of Marine Systems* 148: 14-25 (2015)
- Tiano, L., E. G. Robledo, T. Dalsgaard, A. H. Devol, B. B. Ward, O. Ulloa, D. E. Canfield and N. P. Revsbech. Oxygen distribution and aerobic respiration in the north and south eastern tropical Pacific oxygen minimum zones. *Deep Sea Research I* 194: 173-183 (2014)
- Bowen, J. L., A. R. Babbin, P. J. Kearns and B. B. Ward. Connecting the dots: Linking nitrogen cycle gene expression to nitrogen fluxes from marine sediment mesocosms. *Frontiers in Microbiology* 5:429 (2014)
- Tait, K., Kitidis, V., Ward, B. B., Cummings, D. G., Jones, M. R., Somerfield P. J., Widdicombe, S. Spatio-temporal variability in ammonia oxidation and ammonia oxidising bacteria and archaea in coastal sediments of the Western English Channel. *Marine Ecology Progress Series* 511:41-58 (2014)
- Shilova, I. N., Robidart, J. C., Tripp, H. J., Turk-Kubo, K., Wawrik, B., Post, A. F., Thompson, A. W., Ward, B. B., Hollibaugh, J. T., Millard, A., Ostrowski, M., Scanlan, D., Paerl, R. W., Stuart, R., and Zehr, J. P. A microarray for assessing gene transcription from pelagic marine microbial taxa. *ISME-J* 8: 1476-1491 (2014)
- Chang, B. X., Rich, J. R., Jayakumar, A., Naik, H., Prathihary, A., Keil, R. G., Ward, B. B. and Devol, A. H. The effect of organic carbon on nitrogen loss in the oxygen deficient waters of the Eastern Tropical Pacific and Arabian Sea. *Limnology and Oceanography* 59: 1267-1274 (2014)
- Newell, S. E., Eveillard, D., McCarthy, M. J., Gardner, W. S., Liu, Z., and Ward, B. B. Ammonia oxidizing archaeal community composition in Gulf of Mexico sediments investigated with an *amoA* microarray. *Environmental Microbiology Reports*, 6:106-112 (2014)
- Babbin, A. R., R. Keil, A. H. Devol, and B. B. Ward. Organic matter stoichiometry, flux, and oxygen control nitrogen loss in the ocean. *Science* 344:406-408 (2014)
- Fawcett, S. E., Lomas, M. W., Ward, B. B. and Sigman, D. M. The counterintuitive effect of summer-to-fall mixed layer deepening on the eukaryotic new production in the Sargasso Sea. *Global Biogeochemical Cycles* 28 doi:10.1002/2013GB004579 (2014)
- Ward, B. B. Nitrification. In *Earth Systems and Environmental Sciences*. Elsevier <http://editorial.elsevier.com/app/book?execution=e2s3> (2013)
- Jayakumar, A., Peng, X. and Ward, B. B. Community composition of bacteria involved in fixed nitrogen loss in the water column of two major oxygen minimum zones in the ocean. *Aquatic Microbial Ecology* 70:245-259 (2013)
- Bowen, J. L., Kearns, P. J., Holcomb, M. and Ward, B. B. Acidification alters the community composition of ammonia oxidizing microbial assemblages in marine mesocosms. *Marine Ecology Progress Series* 492: 1-8 (2013)
- Francis, C. A., O'Mullan, G. D., Cornwell, J. C., and Ward, B. B. Transitions in *nirS*-type denitrifier diversity, community composition, and biogeochemical activity along the Chesapeake Bay Estuary. *Frontiers of Microbiology* doi: 10.3389/fmicb.2013.00237 (2013)
- Ward, B. B. How Nitrogen is Lost. *Science* 341:352-353 (2013)
- Peng, X., Jayakumar, A. and Ward, B. B. Community composition of ammonia-oxidizing archaea from surface and anoxic depths of oceanic oxygen minimum zones. *Frontiers of Microbiology* doi: 10.3389/fmicb.2013.00177 (2013)

- Newell, S. E., Fawcett, S. E. and Ward, B. B. Depth distribution of ammonia oxidation rates and ammonia-oxidizer community composition in the Sargasso Sea. *Limnology and Oceanography* 58:1491-1500 (2013)
- Babbin, A. R and B. B. Ward. Controls on nitrogen loss processes in Chesapeake Bay sediments. *Environmental Science and Technology* 47: 4189-4196 (2013)
- Voss, M., Bange, H. W., Dippner, J. W., Middelburg, J. J., Montoya, J. P. and Ward, B. B. The marine nitrogen cycle: Recent discoveries, uncertainties and the potential relevance of climate change. *Philosophical Transactions of the Royal Society B.* 368: 20130121 (2013)
- Ward, B. B. The Global Nitrogen Cycle. In: A. H. Knoll, D. E. Canfield and K. O. Konhauser, Editors, *Fundamentals of Geomicrobiology*, Wiley-Blackwell, Chichester, UK, Pp. 36-48 (2012)
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- Ward, B.B., Devol, A.H., Rich, J.J., Chang, B.X., Bulow, S.E., Naik, H, Pratihary, A. and Jayakumar A. Denitrification as the dominant nitrogen loss process in the Arabian Sea. *Nature* 461: 78-82 (2009)
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- Ward, B. B. and G. D. O'Mullan. Community level analysis: Genetic and biogeochemical approaches to investigate community composition and function in aerobic ammonia oxidation. In: *Methods in Enzymology*, **397**:395-413 (2005)

- Ward, B. B. Temporal variability in nitrification rates and related biogeochemical factors in Monterey Bay, California. *Marine Ecology-Progress Series*, 292: 97-109 (2005)
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- Song, B., and B. B. Ward. Diversity of benzoyl-CoA reductase genes in aromatic compound degrading denitrifying bacteria and in environmental samples, *Applied and Environmental Microbiology*, 71: 2036-2045 (2005)
- Ward, B. B., J. Granger, M. T. Maldonado, K. L. Casciotti, S. Harris and M. L. Wells. Denitrification in the hypolimnion of permanently ice-covered Lake Boney, Antarctica *Aquatic Microbial Ecology*, 52: 197-205 (2005)
- Casciotti, K. L. and B. B. Ward. Nitric oxide reductase (*norB*) genes identified in ammonia-oxidizing bacteria, *FEMS Microbial Ecology*, 52: 197-205 (2005)
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- Casciotti, K. L., D. M. Sigman and B. B. Ward. Linking diversity and biogeochemistry in ammonia-oxidizing bacteria *Geomicrobiology Journal*, 20: 335-353 (2003)
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- Granger, J. and B. B. Ward. Accumulation of nitrogen oxides in copper-limited cultures of denitrifying bacteria. *Limnology and Oceanography*, 48: 313-318 (2003)
- Ward, B. B. and G. D. O'Mullan. Worldwide distribution of marine ammonia-oxidizing Gamma-Proteobacteria detected in seawater by PCR and sequencing of 16S rRNA and *AmoA* genes, *Applied and Environmental Microbiology*, 68: 4153-4157 (2002)
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- Caffrey, J. M., N. E. Harrington and B. B. Ward. Biogeochemical Processes in a Small California Estuary: 1. Benthic Fluxes and Pore Water Constituents Reflect High Nutrient Freshwater Inputs, *Marine Ecology Progress Series*, 233: 39-53 (2002)
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- Ward, B.B. Light and substrate concentration effects on marine ammonium assimilation and oxidation rates. *Mar., Chem.*, 16: 301-316. (1985)
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- Ward, B.B. Photosynthesis and bacterial utilization of phytoplankton exudates: Results from pre- and post-incubation size fractionation. *Oceanol. Acta*, 7: 337-343. (1984)
- Karl, D.M., G.A. Knauer, J.H. Martin, and B.B. Ward. Bacterial chemolithotrophy in the ocean is associated with sinking particles. *Nature*, 309: 54-56. (1984)
- Ward, B.B. Autotrophic activity of ammonium-oxidizing bacteria: Combined autoradiography and immunofluorescence for estimation of single cell activity in the primary nitrite maximum off the coast of Washington. *Limnol. Oceanogr.*, 29: 402-410. (1984)
- Ward, B.B. Oceanic distribution of ammonium-oxidizing bacteria determined by immunofluorescent assay. *J. Mar. Res.*, 40: 1155-1172. (1982)
- Ward, B.B., R.J. Olson, and M.J. Perry. Microbial nitrification rates in the primary nitrite maximum off Southern California. *Deep-Sea Res.*, 29: 247-255. (1982)
- Ward, B.B. and M.J. Perry. Immunofluorescent assay for the marine ammonium-oxidizing bacterium *Nitrosococcus oceanus*. *Appl. Environ. Microbiol.*, 39: 913-918. (1980)

## CURRENT RESEARCH PROGRAMS

- National Science Foundation, Biological Oceanography: Dimensions of Biodiversity: Functional diversity of marine eukaryotic phytoplankton and their contributions to the C and N cycles. (Co-PI Daniel Sigman, Princeton).
- National Oceanographic and Atmospheric Administration: Effects of climate change on phytoplankton community composition and carbon cycling.
- National Science Foundation, DEB-Ecosystems Science: Environmental control of microbial N<sub>2</sub>O fluxes and DIN loss in salt marsh sediments.
- National Science Foundation, Chemical Oceanography: Control of Denitrification and Anammox in the Oxygen Deficient Waters of the Eastern Tropical North and South Pacific.

## RESEARCH CRUISES AND EXPEDITIONS

- 2014 Chief Scientist, R/V Endeavor, Subarctic North Atlantic, 27 days, May.
- 2013 Chief Scientist, R/V Endeavor, Subarctic North Atlantic, 27 days, Aug-Sep.

- 2013 R/V N. B. Palmer, Eastern Tropical South Pacific, 35 days, Jun-Jul.
- 2012 R/V T. G. Thompson, Eastern Tropical North Pacific, 30 days, Mar-Apr.  
Chief Scientist, R/V Atlantic Explorer, Bermuda, 4 days, Aug.
- 2012 R/V Atlantic Explorer, Bermuda, 5 days, Aug.
- 2011 R/V Atlantic Explorer, Bermuda, 4 days, Nov.
- 2009 R/V Atlantic Explorer, Bermuda, 5 days, Dec.
- 2007 Chief Scientist, R/V Roger Revelle, Arabian Sea, 30 days, Sep – Oct.
- 2005 McMurdo Station and Lake Bonney, Antarctica, 6 weeks, Nov-Dec.  
R/V Knorr, Eastern Tropical North Pacific, 21 days, Oct-Nov.
- 2004 McMurdo Station and Lake Bonney, Antarctica, 7 weeks, Nov-Dec.  
Chief scientist, R/V Cape Henlopen, Sargasso Sea, 4 days, Oct, Chesapeake Bay, 3 days Oct.
- 2003 Chief scientist, R/V Cape Henlopen, Sargasso Sea, Chesapeake Bay, 3 days Apr, June, Oct.
- 2002 Chief scientist, R/V Cape Henlopen, Sargasso Sea, 4 days, Apr, Chesapeake Bay, 3 days Oct.
- 2001 Chief scientist, R/V Cape Henlopen, Chesapeake Bay, 3 days, Aug, 3 days Oct.
- 2000 McMurdo Station and Lake Bonney, Antarctica, 6 weeks, Nov-Dec.
- 1999 Chief scientist, R/V Point Sur, Monterey Bay, 5 bimonthly 1-day cruises.  
McMurdo Station and Lake Bonney, Antarctica, 7 weeks, Nov-Dec
- 1998 Chief scientist, R/V Point Sur, Monterey Bay, 6 bimonthly 1-day cruises.
- 1996 R/V Sagar Sampada, Arabian Sea, 13 days, November.
- 1995 Chief Scientist, R/V New Horizon, Eastern Tropical North Pacific, 28 days, July.
- 1994 Chief Scientist, R/V Sproul, Southern California Bight, 6 days, April.  
McMurdo Station and Lake Bonney, Antarctica, 6 weeks, Nov-Dec.
- 1993 Chief Scientist, R/V Point Sur, Monterey Bay, 6 days, March.  
Chief Scientist, R/V Point Sur, Monterey Bay, 6 days, October.
- 1992 Chief Scientist, R/V Sproul, Southern California Bight, 6 days, October.  
McMurdo Station and Lake Bonney, Antarctica, 6 weeks, Nov-Dec.
- 1990 R/V New Horizon, Southern California Bight, 14 days, July.  
R/V New Horizon, Southern California Bight, 10 days, January.
- 1988 Chief Scientist, R/V Sproul, Southern California Bight, 5 days, October.  
R/V Knorr, Black Sea, 16 days, July.  
Chief Scientist, R/V Sproul, Southern California Bight, 5 days, June.
- 1987 R/V New Horizon, CaBS Cruise-7, Southern California Bight, 3 days, October.
- 1986 Chief Scientist, R/V Barnes, Saanich Inlet, British Columbia, 4 days, September.  
Chief Scientist, R/V Barnes, Saanich Inlet, British Columbia, 4 days, August.
- 1986 R/V Iselin, Cariaco Trench, 30 days, February-March.
- 1985 R/V Sproul, SCBS Cruise-23, Southern California Bight, 7 days, May.  
R/V Wecoma, Nitrogen transformations in the oxygen minimum zone off Peru, eastern tropical Pacific, 35 days, March.
- 1983 R/V Wecoma, eastern subtropical Pacific, 30 days, November.
- 1982 R/V New Horizon, SCBS Cruise-22, Southern California Bight, 10 days, May.

- R/V New Horizon, SCBS Cruise-21, Southern California Bight, 5 days, November.
- 1981 R/V T. G. Thompson, DOE-sponsored Northwest Marine Sciences Group cruise, Northeastern Pacific Ocean, 21 days, August.
- 1980 R/V T. G. Thompson, DOE-sponsored Northwest Marine Sciences Group cruise, Northeastern Pacific Ocean, 21 days, September.
- 1979 R/V Oceanus, Northeast Atlantic, 14 days, November.  
R/V T. G. Thompson, subtropical Pacific, 30 days, September.  
R/V T. G. Thompson, DOE-sponsored Northwest Marine Sciences Group cruise, Northeastern Pacific Ocean, 21 days, July.
- 1978 R/V T. G. Thompson, DOE-sponsored Northwest Marine Sciences Group cruise, Northeastern Pacific Ocean, 7 days, May.  
R/V T. G. Thompson, DOE-sponsored Northwest Marine Sciences Group cruise, Northeastern Pacific Ocean, 7 days, March.
- 1977 R/V T. G. Thompson, DOE-sponsored Northwest Marine Sciences Group cruise, Northeastern Pacific Ocean, 10 days, September.  
R/V T. G. Thompson, DOE-sponsored Northwest Marine Sciences Group cruise, Northeastern Pacific Ocean, 7 days, April.

#### **SELECTED PROFESSIONAL ACTIVITIES / UNIVERSITY SERVICE (10 years)**

- 2014 Visiting Committee to review MIT/WHOI Joint Program in Oceanography
- 2014-present Sir Alister Hardy Foundation for Ocean Sciences (SAHFOS) task force member
- 2014-present Princeton University Task Force on the future of the Natural Sciences
- 2014-present Chair SCOR working group chair, Deoxygenation in the Oceans
- 2013-2014 Princeton University President's Committee on the Grading Policy
- 2012-2015 Member, Decadal Survey of Ocean Sciences, National Academy of Sciences
- 2011-present TARA Oceans project, Science Advisory Board
- 2010 Panel Member, Chemical Oceanography, National Science Foundation
- 2010 Steering Committee, NSF Geotraces workshop: The molecular biology of biogeochemistry: Using molecular methods to link ocean chemistry with biological activity
- 2008-2009 Member, President's Committee on Climate Science at Princeton, Princeton University
- 2006-2007 Member, Committee of Three, Princeton University
- 2006-present Chair, Department of Geosciences, Princeton University
- 2005 Panel Member, Biological Oceanography, National Science Foundation
- 2005-2006 Chair, Graduate Work Committee, Department of Geosciences
- 2004-2006 Princeton Environmental Institute, Chair of undergraduate program
- 2004-present Nitrification Network RCH, steering committee
- 2004 Discussion Leader, Picoplankton Gordon Conference, June  
Special Sessions Chair, ASLO 2004 February meeting  
Member, Scientific Advisory Council, Plymouth Marine Laboratory

## **CLASSROOM TEACHING (last five years)**

Environmental Microbiology (GEO 417), Biological Oceanography (GEO 428), Fundamentals of Geosciences (GEO 505, 506)

## **OTHER TEACHING**

Thesis Advisor, Ph.D. Students:

Lee Kerkhof (UCSD), Ph.D. 1991  
Mary Voytek (UCSC), Ph.D. 1996  
Karen Casciotti (Princeton), Ph.D. 2002  
Gregory O'Mullan (Princeton), Ph.D. 2005  
Anita Adhitya (Princeton), Ph.D. 2009  
Silvia Newell (Princeton), Ph.D. 2010  
Sarah Fawcett (Princeton), Ph.D. 2012  
Andrew Babbin (Princeton), Ph.D. 2014  
Xuefeng Peng (Princeton), 2010 – present  
Qixing Ji (Princeton), 2011 – present  
Jessica Lueders-Dumont (Princeton), 2012 – present

Postdoctoral Scholars:

Dr. Sarah E. Fawcett, 2012 – 2015  
Dr. Nicolas van Oostende, 2012 – present  
Dr. Bonnie X. Chang, 2010 – 2013  
Dr. Jenifer Bowen, 2007 – 2010  
Dr. Nicholas Bouskill, 2006 - 2009  
Dr. Punyasloke Bhadury, 2006 - 2008  
Dr. Gregory O'Mullan, 2005 - 2006  
Dr. Jenny Baeseman, 2004 - 2006  
Dr. Jeremy Rich, 2004 - 2007  
Dr. Caroline Tuit, 2003 - 2006  
Dr. Andrew Allen, 2002 - 2006  
Dr. Chris Francis, 2001 - 2003  
Dr. Bongkeun Song, 2000 - 2004  
Dr. Gaspar Taroncher-Oldenburg, 2000 - 2002  
Dr. Amal Jayakumar, 2000 - 2004  
Dr. Melissa Staid, 1998 - 2000  
Dr. Darryl Martino, 1998-2000  
Dr. Deborah Bronk, 1992-1994  
Dr. Dennis Hansell, 1989-1991

Senior Theses Advisor (date thesis completed)

- Spring 1991 Gabriela Tobal: The Effect of Nitrous Oxide on Nitrate Reductase Activity in the Process of Denitrification in *Pseudomonas perfectomarina*.  
Francine A. Stanton: Construction and Applications of Xyl E Probe for Detection of TOL<sup>+</sup> Bacteria Strains in the Santa Cruz Harbor.  
Cindy Smith MacConnell: The Diversity of Luminescent Bacterial Isolates from the Monterey Bay, Characterized through Nutritional Capabilities and Restriction Fragment Length Polymorphism.
- Fall 1991 Lara Hansen: The Effect of UVB Radiation on *Pseudomonas perfectomarina* in Simulated Surface Waters of Monterey Bay.
- Spring 1992 Christina De La Rocha: Tannin Tolerance in Bacteria isolated from the Guts of Herbivorous Marine Invertebrates and Fish.
- Spring 1994 Chris Francis: Quantitative Hybridization Method for Detection and Enumeration of the xylE Gene in a Microbial Mat Community.  
Alisa Kirk: Depth Profile of Plasmid DNA Extracted from the Microbial Mats of Elkhorn Slough.
- Spring 1997 Jeremy Factor, Detection of ammonia monooxygenase and methane monooxygenase genes using the PCR.  
L.C. Gorham: Endosulfan Residue in Sediments of Elkhorn Slough.  
Julia Muldoon: Construction of a Gene Probe for the Detection of the 2,4-D Degrading Plasmid pJP4 in *A. eutrophus* JMP134.  
Jan Purl: A Study of Zooplankton Fecal Pellet Contents as an Indicator of Variation in Diet.
- Spring 1998 Kiersten Ballard: Characterization of ammonia monooxygenase genes in nitrifying bacteria using PCR and sequence analysis.  
Erin Osborne: Detection and quantification of gene fragments homologous with the tfbD gene for 2,4-D degradation in marine sediments  
Caroline Jenkins: Genetic diversity of functional genes in denitrifying bacteria investigated via PCR amplification of NiR gene in unidentified denitrifying bacterial isolates
- Spring 1999 Margaret Harrison: Biology of Doliolids (EEB)
- Spring 2002 Erin Griner: Optimization of microarray hybridization analysis for functional genes (CEM)  
Katrina Jessoe: Diversity of *Synechococcus* and *Prochlorococcus* in the California Current Investigated by rpo-gene sequencing (EEB)
- Spring 2004 Evan Chyun: Real-time PCR quantification of nitrate transporter gene expression in diatoms (GEO)
- Spring 2007 Erin Lough: Diversity of microbial communities associated with Mediterranean shipwrecks (EEB)
- Spring 2010 Diana Chien; Phytoplankton Species Composition Investigated using functional Gene microarrays (EEB)
- Spring 2012 Owen Coyle: A High-Definition Examination of Nitrogen Transformation in Marine Sediments

Alisa Tao: Sequence of Dissolved Inorganic Nitrogen Production During Denitrification by Marine Bacterial Strains  
Spring 2015 Martin Wolf (CBE): No Nitrification, No NO<sub>3</sub>? The Importance of Nitrification in the Epipelagic North Atlantic

#### Independent Study Advisor

Fall 1992 Kristy Paterson, Estimating Bacterial Production in Southern California Bight from the Simultaneous Incorporation of Thymidine and Leucine.

#### Junior Paper Advisor (Princeton)

Fall 1998 Kristin Coleman: Ancient DNA  
Spring 1998 Hadley Owen: Sargasso Sea Thermocline  
Fall 2002 Steven Andrews: Analysis of the Physical and Biological Structure of a Dynamic Estuary: A Transect of the Upper Chesapeake Bay  
Evan Chyun: Anaerobic Toluene Metabolism by Halobenzoate-Degrading Denitrifying Bacteria  
Spring 2003 Evan Chyun: Arsenite oxidase Genes in Bacteria from Various Aquatic Habitats  
Spring 2006 Erin Lough: Fragment Length Analysis for Investigation of Microbial Diversity in Natural Waters  
Fall 2008 Diana Chien: Phytoplankton community composition from microarray data compared to biogeochemical model predictions (EEB)  
Spring 2009 Diana Chien: Phytoplankton Species Composition Investigated using functional Gene microarrays  
Fall 2010 Owen Coyle: Stoichiometric Constraints on Nitrogen transformations: Interpreting Mesocosm Experimental Results  
Fall 2011 Elisabeth Shouten: Regulation of the Denitrification Sequence by Marine Bacterial Strains  
Spring 2014 Sean McIntee: Partitioning uptake of nitrogen among phytoplankton taxa in the North Atlantic  
Spring 2015 Clair Zarakas: Spatial and Seasonal Variations in the Size Structure of North Atlantic Phytoplankton Assemblages  
Sophia Myers: Nitrogen Isotopes in Fish Otoliths and their Intra-Organism Correlation