

KATHERINE R. M. MACKEY

226 Woods Hole Rd Woods Hole MA 02536 • 301.356.4041 • kmackey@whoi.edu

EDUCATION

Stanford University, Civil and Environmental Engineering, Ph.D. 2010

Stanford University, Civil and Environmental Engineering, M.S. 2004

University of Maryland, College Park, Plant Biology, B.S. 2002

University of Maryland, College Park, Biological Resource Engineering, B.S. 2002

RESEARCH EXPERIENCE

Postdoctoral Research Fellow (NSF Biology), 2011 – current

Joint appointment between the Woods Hole Oceanographic Institution (PI: Mak Saito) and the Bay Paul Center for Comparative Molecular Biology and Evolution, Marine Biological Laboratory (PI: Anton Post)

Project: “Proteomic, genomic, and elemental characterization of photosynthetic strategies for coping with iron limitation in Earth’s most abundant photosynthetic organisms”

Postdoctoral Researcher, 2010 – 2011

Institute of Marine Sciences, UC Santa Cruz (PI: Adina Paytan), in collaboration with the Carnegie Institution for Science, Department of Global Ecology (PI: Ken Caldeira).

Projects: “Strain specific responses of marine picocyanobacteria to elevated carbon dioxide and temperature” and “Atmospheric deposition impacts on marine ecosystems”

Doctoral Research, Civil and Environmental Engineering, Stanford University, 2004 – 2010

Co-Advisor: Adina Paytan, Institute of Marine Sciences, UC Santa Cruz; formerly Department of Geological and Environmental Sciences, Stanford University

Co-Advisor: Arthur Grossman, Department of Plant Biology, Carnegie Institution for Science

Dissertation: “On the response of marine phytoplankton to changing nutrient and light conditions”

Master's Student, Civil and Environmental Engineering, Stanford University, 2003 - 2004

Engineering Consultant, Biological Resources Engineering, UMD/ NIOSH, 2002 - 2003

Engineer/ Contractor, Biological Resources Engineering, UMD, 2002

Laboratory Technician, Department of Agriculture, UMD, 2001 – 2002

Tropical botany field courses, La Suerte and Ometepe field stations, Costa Rica & Nicaragua, 2001

Desert ecology field research course, Biosphere 2 Center, Oracle AZ, Columbia University, 1998

Island biogeography field research course, Sea of Cortez, Mexico, Columbia University, 1998

Internship, Walter Reed Army Institute of Research, Neuroscience, Washington, DC, 1997 - 1998

Internship, Walter Reed Army Institute of Research, Pathology, Washington, DC, 1996

FELLOWSHIPS

National Science Foundation Postdoctoral Fellowship in Biology, 2011-2014

National Oceanographic and Atmospheric Administration Climate & Global Change Fellowship, 2011-2013,
funding declined

Woods Hole Oceanographic Institution Devonshire Postdoctoral Fellowship, 2011-2013

Department of Energy Global Change Education Program Graduate Research Fellowship, 2006-2010

National Science Foundation Graduate Research Fellowship, 2003-2006

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SCHOLARSHIPS & GRANTS

MEECE modeling course travel grant, Middle Eastern Technical University, Ankara, Turkey, 2011
Early Career Travel Grant, ASLO Ocean Sciences Meeting, San Juan Puerto Rico, 2011
Coastal and Estuarine Research Federation Conference Travel Grant, 2009
Geological Society of America Graduate Research Grant, 2006
Stanford School of Earth Sciences McGee Research Grant, 2006
Shell Foundation Travel Grant, ASLO Ocean Sciences Meeting, Honolulu, HI, 2006
Ganju Tamboli Scholarship in International Agriculture, 2001
Delmarva Safety Association Scholarship in Engineering, 2001
Academic Achievement Scholarship, College of Engineering, UMD, 1998
Dean's Scholar Award, Chemical Engineering, UMD, 1997

HONORS & AWARDS

Selected for a "Research Highlight" of my postdoctoral project on the NSF website research.gov, 2013
Selected to attend the Consortium for Ocean Leadership Marine Geosciences Leadership Symposium, 2013
Selected to attend the DISsertations initiative for the advancement of Climate Change ReSearch (DISCCRS) Symposium (32 selectees from 204 applicants), Colorado Springs, CO, 2011
Selected to attend the Marine Ecosystem Evolution in a Changing Environment (MEECE) 8 day modeling course, Middle Eastern Technical University, Ankara, Turkey, 2011
Outstanding Student Paper Award, American Geophysical Union Fall Meeting, 2009
Outstanding Student Paper Award, American Geophysical Union Fall Meeting, 2007
Beverly Green Young Investigator Award, Western Photosynthesis Conference, 2007
Outstanding Student Paper Award, American Geophysical Union Fall Meeting, 2006
University of Maryland Honors Program
Graduating Senior Marshal Award, 2002
Alpha Epsilon Agricultural and Biological Honors Society, inducted 2002
NABEC-ASAE Student Engineering Design Competition 3rd place Winner, 2002
The Order of the Engineer, UM Chapter, inducted 2002
National Society of Collegiate Scholars, inducted 1997

PEER REVIEWED PUBLICATIONS

1. **Mackey, KRM**, D Hunter, E.V. Fischer, Y Jiang, B Allen, Y Chen, A Liston, J Reuter, G Schladow, & A Paytan. Aerosol-induced picoplankton growth in Lake Tahoe. *In Revision*.
2. **Mackey, KRM**, K Caldiera, A Grossman, D Moran, M McIlvin, A Paytan, & M Saito. Effect of temperature on photosynthesis and growth in diverse marine *Synechococcus* strains. *In Revision*.
3. Cusack, D, J Aksen, R Shwom, L Hartzell-Nichols, S White, **KRM Mackey**. An interdisciplinary assessment of climate engineering strategies. *In Review*.
4. **Mackey, KRM**, KN Buck, JR Casey, A Cid, MW Lomas, Y Sohrin & A Paytan. 2012. Phytoplankton responses to atmospheric metal deposition in the coastal and open-ocean Sargasso Sea. *Frontiers in Microbiology* vol 3, article 359, doi: 10.3389/fmicb.2012.00359

5. **Mackey, KRM**, K Roberts, MW Lomas, AF Post, M Saito, & A Paytan. 2012. Enhanced solubility and ecological impact of atmospheric phosphorus deposition upon extended seawater exposure. *Environmental Science and Technology*. 46: 10438–10446. <http://dx.doi.org/10.1021/es3007996>
6. **Mackey, KRM**, CE Mioni, JP Ryan & A Paytan. 2012. Phosphorus cycling in the red tide incubator region of Monterey Bay in response to upwelling. *Frontiers in Microbiology* vol 3, article 33, doi: 10.3389/fmicb.2012.00033
7. Meeder, E, **KRM Mackey**, A Post, A Paytan, D Iluz, N Stemberler, Y Shaked, T Rivlin, & B Lazar. 2012. Nitrite dynamics in the open ocean—clues from seasonal and diurnal variations. *Marine Ecology Progress Series* 453: 11-26 doi: 10.3354/meps09525
8. **Mackey, KRM**, L. Bristow, DR Parks, MA Altabet, AF Post & A Paytan. 2011. The influence of light on nitrogen cycling and the primary nitrite maximum in a seasonally stratified sea. *Progress in Oceanography*. 91:545-560; DOI: 10.1016/j.pocean.2011.09.001
9. **Mackey, KRM**, G van Dijken, S Mazloom, AM Erhardt, J Ryan, K Arrigo, & A Paytan. 2010. Influence of atmospheric nutrients on primary productivity in a coastal upwelling region. *Global Biogeochem. Cycles*. 24: GB4027, doi:10.1029/2009GB003737
10. **Mackey, KRM**. 2010. On the response of marine phytoplankton to changing nutrient and light conditions. Doctoral dissertation. Stanford University.
11. Pennebaker, K, **KRM Mackey**, and JP Zehr. 2010. Diel cycling of DNA-staining and nifH gene regulation in the unicellular cyanobacterium *Crocospheera watsonii* Strain WH8501 (CYANOPHYTA). *Environmental Microbiology*. doi:10.1111/j.1462-2920.2009.02144.x
12. Grossman, AR, **KRM Mackey**, & S Bailey. 2010. A perspective on photosynthesis in the oligotrophic oceans: Hypotheses concerning alternate routes of electron flow. *J. Phycology*. DOI: 10.1111/j.1529-8817.2010.00852.x
13. **Mackey, KRM**, T. Rivlin, AR Grossman, AF Post, & A Paytan. 2009. Picophytoplankton responses to changing nutrient and light regimes during a bloom. *Marine Biology* **156**: 1531.
14. Paytan, A, **KRM Mackey**, Y Chen, ID Lima, SC Doney, N Mahowald, R Labiosa, and AF Post. 2009. Toxicity of atmospheric aerosols on marine phytoplankton. *PNAS* **106**: 4601-4605.
15. **Mackey, KRM**, A Paytan, A Grossman, and S Bailey. 2008. A photosynthetic strategy for coping in a high light, low nutrient environment. *Limnol. Oceanogr.* 53:900-913.
16. Bailey, S, A Melis, **KRM Mackey**, P Cardol, G Finazzi, G van Dijken, GM Berg, K Arrigo, J Shrager, and A Grossman. 2008. Alternative photosynthetic electron flow to oxygen in marine *Synechococcus*. *Biochimica et Biophysica Acta*. 1777: 269-276.
17. **Mackey, KRM**, RG Labiosa, M Calhoun, J Street, AF Post, and A Paytan. 2007. Phosphorus availability, phytoplankton community dynamics, and taxon-specific phosphorus status in the Gulf of Aqaba, Red Sea. *Limnol. Oceanogr.* 52: 873-885.

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BOOK CHAPTERS

18. Mackey, KRM & A Paytan. 2009. Phosphorus Cycle. Encyclopedia of Microbiology. Moselio Schaechter, Editor, pp. 322-334 Oxford: Elsevier.

EDUCATION & ACADEMIA PUBLICATIONS

19. Mackey, KRM. 2012. Advising on the edge. *Nature* 490: 301.
20. Fischer, EV, KRM Mackey, DF Cusack, LRG DeSantis, L Hartzell-Nichols, JA Lutz, J Melbourne-Thomas, R Meyer, DA Riveros-Iregui, CJ Sorte, JR Taylor & SA White. 2012. Is pretenure interdisciplinary research a career risk? *EOS* 93: 311-312.
21. Mackey, KRM & DL Freyberg. 2010. The effect of social presence on affective and cognitive learning in an international engineering course taught via distance-learning. *J. Engineering Education* 99: 23-34.
22. Mackey, KRM & DL Freyberg. 2010. They learn, but enjoy it less: Online students miss face-to-face communication. *Prism Magazine*. January issue.

BIOMECHANICAL ENGINEERING PUBLICATIONS

23. Scott, WH, FC Koh, KYS Chiou, KRM Mackey, & AT Johnson. 2008. Quantifying energy expenditure during water-immersion in non-trained cyclists. *Biological Engineering* 1: 281-289
24. Johnson, AT, FC Koh, WH Scott, KRM Mackey, KYS Chiou, & T Rehak. 2005. Inhalation flow rates during strenuous exercise. *J. International Society for Respiratory Protection*. 22: 79-96.
25. Mackey, KRM, AT Johnson, WH Scott, FC Koh. 2005. Over breathing a loose-fitting PAPR. *J. International Society for Respiratory Protection*. 22: 1-10.
26. Johnson, AT, KRM Mackey, WH Scott, FC Koh, KYH Chiou, SJ Phelps. 2005. Exercise performance while wearing a tight-fitting powered air purifying respirator with limited flow. *J. Occupational and Environmental Hygiene*. 2: 368-373.

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PROFESSIONAL PRESENTATIONS AND ABSTRACTS

1. **Mackey, KRM & MA Saito.** Proteomic response of *Synechococcus* to light and temperature. American Society of Limnology and Oceanography Meeting, New Orleans, LA, February 18-22, 2013. *Abstract selected for oral presentation.*
2. Chien, C-T, **KRM Mackey,** & A Paytan. Effects of atmospheric dry deposition on native phytoplankton in Barbados. American Geophysical Union, San Francisco, CA, December 3-7, 2012. Abstract OS31D-1768. *Poster.*
3. **Mackey, KRM.** Optimizing photosynthesis for growth at different temperatures in marine *Synechococcus*. WHOI Postdoctoral Symposium, Woods Hole, MA, October 17. *Talk.*
4. **Mackey, KRM.** Environmental and physiological factors influencing *Synechococcus* biogeography. Marine Biological Laboratory (MBL) Ecosystems Seminar Series, Woods Hole, MA October 16, 2012. *Invited talk.*
5. **Mackey, KRM,** CE Mioni, JP Ryan, & A Paytan. Phosphorus cycling in the red tide incubator region of Monterey Bay in response to upwelling. Boston Bacterial Meeting, June 7-8, Harvard University, Cambridge, MA. *Poster.*
6. Lecher, A, A Paytan, K Null, **KRM Mackey,** N Dimova, C Schmidt, P Swarzenski, & J Ryan: A coupled approach to measuring submarine groundwater discharge and algal response in northern Monterey Bay, CA. Ra-Rn Workshop, Narragansett, RI, June 2012.
7. **Mackey, KRM.** Exploring the impacts of atmospheric deposition on marine phytoplankton. University of the West Indies, Cavehill, Barbados, Department of Biological and Chemical Sciences. February 22, 2012. *Invited talk.*
8. **Mackey, KRM & A Paytan.** Variable solubility and ecological impact of atmospheric phosphorus deposition. American Geophysical Union, San Francisco, CA, December 5-9, 2011. Abstract H52E-07. *Abstract selected for oral presentation.*
9. Lecher, A, KA Null, **KRM Mackey,** NT Dimova, A Paytan, CM Schmidt, PW Swarzenski, JP Ryan. Evaluation of submarine groundwater discharge as a source of nutrients, carbon, and metals to the Monterey Bay Extreme Bloom Incubator. American Geophysical Union, San Francisco, CA, December 5-9, 2011. Abstract H31G-1254. *Poster.*
10. **Mackey, KRM.** The effect of atmospheric deposition on the distribution and abundance of marine phytoplankton. WHOI Marine Chemistry and Geochemistry Seminar Series. November 15, 2011. *Invited talk.*
11. **Mackey, KRM,** Y. Chen, A. Cid, M Lomas, J Casey, A Post, Y Sohrin & A Paytan. Picophytoplankton growth and toxicity responses to atmospheric metal deposition. American Society of Limnology and Oceanography Ocean Sciences Meeting, San Juan, Puerto Rico, February 14-18, 2011. *Abstract selected for oral presentation.*
12. **Mackey, KRM.** The effect of atmospheric deposition on phytoplankton growth. Princeton University Department of Chemistry. January 7, 2011. *Invited talk.*
13. **Mackey, KRM,** L Bristow, MA Altabet, AF Post, and A Paytan. Effect of light and substrate availability on the primary nitrite maximum in the Gulf of Aqaba, Red Sea. American Geophysical Union, San Francisco, CA, December 13-17, 2010. Abstract OS51C-1326. *Poster*

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14. Paytan, A, **KRM Mackey**, Y Jiang, A Liston, B Allen, & G. Schladow. Impact of atmospheric deposition on algal growth in Lake Tahoe. American Geophysical Union, San Francisco, CA, December 13-17, 2010. Abstract B33B-0405. *Poster*
15. **Mackey, KRM**. The effect of atmospheric deposition on the distribution and abundance of marine phytoplankton. University of California, Santa Cruz, Department of Ocean Sciences. November 17, 2010. *Invited talk*.
16. **Mackey, KRM** & A Paytan. The effect of atmospheric deposition of metals on the distribution and abundance of marine phytoplankton. Gordon Research Conference on Environmental Bioinorganic Chemistry, Newport, RI, June 13-18, 2010. *Poster*.
17. Paytan, A, **KRM Mackey**, E Reistetter, C Buck. Aerosol impacts on marine phytoplankton. Goldschmidt, Knoxville, TN, June 14, 2010. *Oral Presentation*.
18. **Mackey, KRM**, G van Dijken, S Mazloom, AM Erhardt, K Arrigo, & A Paytan . The influence of atmospheric nutrients on primary productivity in coastal upwelling regions. American Geophysical Union, San Francisco, CA, December 14-18, 2009. Abstract A13J-0433. *Awarded Poster*.
19. **Mackey, KRM** and A Paytan. Atmospheric deposition and primary production in coastal California: Findings from MODIS and in situ monitoring. Coastal and Estuarine Research Foundation, Portland OR, November 1-5, 2009. *Oral Presentation*.
20. Paytan A, **KRM Mackey**, Y Chen, ID Lima, SC Doney, N Mahowald, AF Post. Atmospheric aerosols impacts on marine phytoplankton. Goldschmidt, June 2009. *Oral Presentation*.
21. **Mackey, KRM**, A Paytan, T Rivlin, AR Grossman, and AF Post. Acclimation strategies during a bloom: Picophytoplankton responses to changing nutrient and light regimes. Western Photosynthesis Conference, Pacific Grove, CA, January 8-11, 2009. *Poster*.
22. **Mackey, KRM**, A Paytan, and A Post. Nitrogen Cycling in the Oligotrophic Ocean: How Seasonal Physical Processes Determine Biologically-Mediated Nitrogen Transformations. American Geophysical Union, San Francisco, CA, December 15-19, 2008. Abstract OS11B-1122. *Poster*.
23. Paytan, A, **KRM Mackey**, Y Chen, ID Lima, SC Doney, N Mahowald, R Labiosa, and AF Post. Toxicity of atmospheric aerosols on marine plankton. American Geophysical Union, San Francisco, CA, December 15-19, 2008. Abstract OS14B-02. *Oral Presentation*.
24. Chan, J, **KRM Mackey**, and A Paytan. The effects of nutrient and trace metal enrichment on coastal and oceanic strains of *Synechococcus*. American Geophysical Union, San Francisco, CA, December 15-19, 2008. Abstract OS11B-1121. *Awarded poster* – Chan was my undergraduate advisee.
25. Danford, C, **KRM Mackey**, and A Paytan. Anthropogenic ocean acidification and its effects on calcifying phytoplankton: The response of eight coccolithophore strains to changing pH. American Geophysical Union, San Francisco, CA, December 15-19, 2008. OS21A-1159. *Poster* – Danford was my undergraduate advisee.
26. Mazloom, S, **KRM Mackey**, and A Paytan. Does atmospheric deposition support phytoplankton productivity in Monterey Bay, CA? American Geophysical Union, San Francisco, CA, December 15-19, 2008. Abstract ED43A-0582. *Poster* – Mazloom was my high school intern.
27. **Mackey, KRM**, A Paytan, AR Grossman, and S Bailey. A photosynthetic strategy for coping in a high light, low nutrient environment. American Society for Photobiology, Burlingame, CA, June 20-25, 2008. Abstract TAM5-3. *Invited oral presentation*.

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28. **Mackey, KRM**, A Paytan, and AR Grossman. Bloom or doom: Surviving the transition from mixing to stratification. American Society of Limnology and Oceanography Ocean Sciences Meeting, Orlando, FL, March 2-7, 2008. Abstract 3034. *Poster*.
29. **Mackey, KRM**, A Paytan, and AF Post. Organic nutrient enrichment in the oligotrophic ocean: Impacts on remineralization, carbon sequestration, and community structure. American Geophysical Union, San Francisco, CA, December 10-14, 2007. Abstract OS11B-0502. *Awarded poster*.
30. **Mackey, KRM**, RG Labiosa, M Calhoun, J Street, AF Post, and A Paytan. Phosphorus availability, phytoplankton community dynamics, and taxon-specific phosphorus status in the Gulf of Aqaba, Red Sea. Society of Limnology and Oceanography Ocean Sciences Meeting, Santa Fe, February 5-9, 2007. *Oral presentation*.
31. Paytan, A., **KRM Mackey**, and M. Young. 2007. Controls on the biologically mediated oxygen isotope exchange between water and phosphate. American Society of Limnology and Oceanography Ocean Sciences Meeting, Santa Fe, February 5-9, 2007. Abstract 326.
32. **Mackey, KRM**, S Bailey, A Grossman, and A Paytan. Oxygen reduction in picocyanobacterial photosynthesis: a novel strategy for coping in a high light, low nutrient environment. Western Photosynthesis Conference, Pacific Grove, CA, January 4-7, 2007. *Invited awarded oral presentation*.
33. **Mackey, KRM**, RG Labiosa, M Calhoun, J Street, AF Post, and A Paytan. 2006. Phosphorus availability, phytoplankton community dynamics, and taxon-specific phosphorus status in the Gulf of Aqaba, Red Sea. EOS Trans. American Geophysical Union, 87(52), Fall Meet. Suppl., Abstract OS21B-1580. *Awarded poster*.
34. **Mackey, KRM**, Street, J, Labiosa, R, and Paytan, A. Effects of phosphorus availability and source on phytoplankton assemblages in the Gulf of Aqaba, Red Sea. American Society of Limnology and Oceanography Ocean Sciences Meeting, Honolulu, HI, February 20-24, 2006. *Poster*.
35. **Mackey, KRM**, Labiosa, RG, Street, JH, and Paytan, A. 2005. Nitrogen and phosphorus co-limit growth and control community composition and taxon specific nutrient status in the Gulf of Aqaba, Red Sea. EOS, Trans. American Geophysical Union, 86: 52, Fall Meet. Suppl., Abstract OS31A-1434. *Poster*.

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TEACHING EXPERIENCE & TRAINING

“COSEE Professional Development Workshop for Early Career Scientists”, 8hr workshop, WHOI, 2012
“Setting Goals for Effective and Innovative Courses”, 1.5hr webinar through Hamilton College, 2012
Guest Lecturer for graduate-level course on ocean acidification at UC Santa Cruz, Lecture topic: “Effects of ocean acidification on photosynthesis and primary productivity”, 2011
“On the Cutting Edge: Preparing for an Academic Career in the Geosciences”, 3-day workshop, NSF Division of Undergraduate Education, Stanford University, 2010
“Communicating Ocean Sciences to Informal Audiences”, 3-day COSEE workshop, Lawrence Hall of Sciences, 2010
Course Co-Instructor, Gulf of the Farallon Islands Oceanographic Research Mini-Course, 2008
Substitute Teacher, The Harker School, San Jose, CA, 2005 - 2008
Teaching Assistant, Human exposure analysis, Stanford University, 2007
Teaching Assistant, Watersheds and Wetlands, Stanford University, Fall 2004
Teaching Assistant, General chemistry I&II, Honors Chemistry I, UMCP, 1999 - 2001

FIELD WORK

Coastal Barbados, Caribbean Sea, small-boat and land based experiments, 2/2012
Monterey Bay, CA, small-boat and land-based experiments, 6/2011
East China Sea, Shanghai, China, small-boat and land based experiments, 4/2011
Lake Tahoe, CA, small-boat and land-based experiments, 7/2010
Coastal Bermuda & North Atlantic Subtropical Gyre, BATS cruise and land-based experiments, 4/2010
Monterey Bay, CA, ship and land-based monitoring and experiments, 10/2009
Sacramento River Delta, CA, small-boat and land-based experiment, 6/2009
Gulf of Aqaba, Red Sea, Israel and Jordan, ship and land-based monitoring and experiments, 3/2008
Gulf of Aqaba, Red Sea, Israel and Jordan, ship and land-based monitoring and experiments, 3/2007
North Atlantic Subtropical Gyre, BATS cruise #X0619, R/V Atlantic Explorer; & Hamilton, Bermuda, land-based monitoring 11/2006
North Pacific Subtropical Gyre, HOT cruise #187, R/V Kilo Moana; & Waikiki, HI, land-based monitoring 11/2006
Gulf of Aqaba, Red Sea, Israel and Jordan, ship and land-based monitoring and experiments, 10/2006

SYNERGISTIC ACTIVITIES

Student Mentoring in Research

Mentor to Stanford University undergraduate students Chris Danford (2005-2008), Josh Chan (2007-2008), and Catherine Lu (2011)
Mentor to high school student Simran Mazloom, summer 2008

Educational Outreach and University Service

Student Presentation Judge, American Society for Limnology and Oceanography Meeting, 2013.
Falmouth Academy Science Fair Judge, 2013
Falmouth High School Career Day, “Biological Oceanography” career talk, 2012.
Student Presentation Judge, AGU Fall Meeting, San Francisco CA 2011
“The Ocean Carbon Cycle” presentation and algae/zooplankton microscope demonstration for visiting middle school students from Pine Point School, Stonington CT, 2011, 2012

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“What does an Oceanographer Do?” Presentation for visiting high school students from Leadership Public Schools, Oakland CA, 2011

National Science Bowl, contributed 60 high school-level questions on environmental and ocean sciences, 2010

AGU Climate Science Q&A: United Nations Framework Convention on Climate Change, Cancun Mexico, provided scientific support for journalists, 2010

AGU Climate Science Q&A: United Nations Copenhagen Negotiations, provided scientific support for journalists, 2009

Student Poster Judge, Coastal and Estuarine Research Foundation Conference, Portland OR 2009

Committee on Teaching Assistant Oversight Representative, Stanford, 2005 - 2008

Synopsys Science and Technology Championship Science Fair Judge, March 2006, 2008, 2010

Geokids! Geology Unit Instructor, Stanford 2005 - 2008

Sally Ride Science Festival Instructor, 2005, 2006

6th grade Oceanography Unit Instructor, Fall 2004

Botany Volunteerism

US National Arboretum Herbarium, Washington DC – have assisted T. Culbertson with collection, botanical description, pressing, and mounting of >4000 herbarium specimens focusing on plants of horticultural interest, including accessions from the following collections:

- Yerba Buena (California native plant nursery, Woodside CA, 2003)
- Strybing Arboretum (primarily from the succulent, Australian and New Zealand, and Chilean gardens, San Francisco CA, 2003)
- San Jose Municipal Rose Garden (San Jose CA, 2003)
- California Carnivores (carnivorous plant nursery, collection focused on New World pitcher plants in the family *Sarraceniaceae*, Sebastopol CA, 2007)
- Corralitos Gardens (dahlia hybridizing nursery, Corralitos CA, 2007)
- San Francisco Dahlia Society Meetings & Annual Show (Hall of Flowers, San Francisco CA, 2007)
- Tilden Botanic Garden (California native plants garden, Berkeley CA, 2008)
- The Arboreum Company (rare and heirloom fruit tree orchard and supplier, Morgan Hill CA 2010-2011)
- Rhododendron Species Foundation Botanical Garden (Seattle WA, 2011)
- Polly Hill Arboretum (Martha’s Vineyard, West Tisbury MA, 2012)
- Heritage Museums & Gardens (Rhododendron collection, Sandwich MA, 2012)