EMILY ELIZABETH PEACOCK

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## EDUCATION

**BOSTON UNIVERSITY MARINE PROGRAM,** Woods Hole, MA MA, September 2007

**Advisors:** Professor Ivan Valiela, BUMP; Dr. Christopher Reddy, WHOI

**Research:** Analyzing oil spill contamination in salt marshes, and estimating

erosion rates in contaminated areas using GIS and sediment dating.

**Degree:**  Master of Arts, Biology

**Award:** EPA STAR Fellowship

**CONNECTICUT COLLEGE,** New London, CT BA, May 2002

**Major:** Environmental Chemistry GPA: 3.34

**Minor:** Hispanic Studies

**Language:** Spanish

## WORK EXPERIENCE

**Woods Hole Oceanographic Institution, Department of Biology**

*Research Associate III* July 2015-present

*Research Assistant III* September 2009-July 2015

• Work with Heidi Sosik to study phytoplankton ecology in the coastal

waters of Martha’s Vineyard

• Manually classify phytoplankton images from the imaging flow-cytometer at the Martha’s Vineyard Costal observatory, Arctic data sets, and North Atlantic cruises.

• Extract and amplify DNA from single cells as well as bulk water samples.

• Collaborate with software developers Eric Orenstein and Oscar Beijbom using our annotated image data set

• Send IFCB on NOAA cruises, installing it and training cruise participants in basic operation.

• Manually annotate video plankton recorder (VPR) images with Dennis McGuillicuddy

• Write user guides for IFCB related topics including: IFCB at Sea, Manual Classify, IFCB-AV, and the web services-based dashboard for accessing the IFCB images

• Assist new user groups of IFCB image processing software during their training visits to WHOI.

• Assisted with development of a manual classification tool, primarily through beta-testing and contribution of ideas

• Process and analyze HPLC pigment data from MVCO and the Arctic using CHEMTAX

• Isolate and culture diatoms and parasites from MVCO for additional study

• Care for *Synechococcus* cultures.

• Analyze water samples for chlorophyll content, particulates, CDOM and flow-cytometry.

• Prepare MVCO instruments for deployment and maintenance shipping.

• Use MATLAB for plotting and analyzing data

• Created and maintain a wiki of phytoplankton example images from IFCB

• Initiated study of parasites in *Guinardia delicatula* at MVCO, and published results

• Participated in the Ocean Imaging Informatics (OII) collaboration

• Attended the International Phytoplankton Identification Workshop,Plymouth, England, July 2012

• Sailed on the Coast Guard icebreaker *Healy* with Sam Laney for five weeks taking water samples, running them on the imaging flow-cytometer, and organizing data (2010)

• Sailed independently on the icebreaker *Nathaniel B. Palmer* for 65 days in Antarctica operating the imaging-flow cytometer and Accuri C6 flow cytometer (2011)

• Sailed on the R/V *Knorr* for two weeks with Ben Van Mooy’s BLATZ-II cruise (2012)

• Sailed on the R/V *Oceanus,* MUSSiC cruise independently running dilution experiments for Matt Johnson (2015)

• Sailed on the NOAA ship *Henry Bigelow* with IFCB on and ECOMON cruise (2015)

• Sampled at Plum Island Estuary with Rachel Stanley and Amanda Spivak, including sampling for Total Oxygen Isotopes (TOI)

**Woods Hole Oceanographic Institution, Department** September 2007-August 2009

**Of Marine Chemistry and Geochemistry,** Woods Hole, MA

*Research*  • Worked with Christopher M. Reddy to study the fate of petroleum hydrocarbons and

*Assistant II* biodiesel in the marine environment

• Mentored a summer student in the study of biodegradation of biodiesel in seawater

• Analyzed samples to study the accumulation of biodiesel in the engine oil of a biodiesel operated car.

• Participated in the analysis of plastics in the ocean

• Operated and maintained a Gas Chromatograph

• Published results in two first-author and multiple co-author papers

**Woods Hole Oceanographic Institution, Department** December 2002-June 2005

**Of Marine Chemistry and Geochemistry,** Woods Hole, MA

*Research*  • Worked with Christopher M. Reddy to study the fate of petroleum hydrocarbons in

*Assistant I* the marine environment

• Studied the persistence of oil in the marsh from the 1969 West Falmouth oil spill

• Extracted oil from marsh sediments and purified the extracts using silica gel chromatography

• Used gas chromatography for quantification and compositional analysis of petroleum hydrocarbons and other organic contaminants

• Collected samples aboard the research vessels *Oceanus* and *Cape Hatteras*

• Instructed high-school students in completion of projects in our laboratory

• Published results in two first-author and multiple co-author papers

**Sea Education Association,** Woods Hole, MA Summer 2002, Part time 2003

*Assistant* • Operated oceanographic research lab aboard the 134 ft Sailing School Vessel *Corwith Cramer*

*Scientist* • Led high school and college students in lab operations and ship routines

• Assisted students with data analysis, papers and presentations

• Deployed the Carousel, CTD, meter nets, and Shipek grab

• Operated Benthos Chirp and Acoustic Doppler Current Profiler

• Analyzed samples for Chlorophyll-a, Nitrates, Phosphates, and dissolved oxygen

**Save Barnegat Bay,** Lavallette, NJ Summer 1997, summer 1999

*Environmental* • Edited and updated mailing lists

*Intern* • Worked with volunteers

• Created attractive displays of SBB accomplishments

• Proofread newsletters and fundraising letters for aesthetic value

## OTHER WORK

**Pie in the Sky Bakery and Café,** Woods Hole, MAJune 2002-present

Baker, • Specialize in friendly service and training new employees in the art of serving people

*Manager* • Bake a wide variety of pastries, breads, and desserts from scratch and train others to bake

• Hired and scheduled the staff of about 50 employees in the summer using Microsoft Excel

• Managed staff relations and staff-customer interactions

• Assisted with banking and book keeping using QuickBooks Pro

• Managed and designed printing of menus, signs and fliers for regular and seasonal promotions using Microsoft Publisher and Word

## CRUISE PARTICIPATION

R/V *Tioga,* MVCO, occasional 1 day trips, 2009-present.

NOAAS *Henry B. Bigelow,* HB1502, ECOMON May 19 – June 3, 2015.

R/V *Oceanus,* MUSSiC, OC1504A, April 19 – May 2, 2015.

R/V *Knorr*, BLATZ-II cruise, April 21 – May 4, 2012.

R/V *Nathaniel B. Palmer*, CLIVAR S04P cruise, February 19 –April 23, 2011.

USCGC *Healy,* ICESCAPE, June 15 – July 21 2010.

R/V Cape Hatteras, Gulf of Maine, August 2004.

R/V *Oceanus,* Gulf of Maine, April 16-23, 2004.

## PUBLICATIONS

Smith, W. O., D. J. McGillicuddy Jr., E. B. Olson, V. Kosnyrev, **E. E. Peacock**, H. M. Sosik. 2016. Mesoscale variability in intact and ghost colonies of *Phaeocystis Antarctica* in the Ross Sea: Distribution and abundance. J. Mar. Syst., <http://dx.doi.org/10.1016/j.jmarsys.2016.05.007>

*Role: Image annotation of VPR images of Pheaeocystis.*

Hunter-Cevera, K. R., A. F. Post, **E. E. Peacock**, H. M. Sosik. 2015. Diversity of *Synechococcus* at Martha’s Vineyard Coastal Observatory: Insights from Culture Isolations, Clone Libraries, and Flow Cytometry. *Microbial Ecology*, DOI 10.1007/s00248-015-0644-1.

*Role: Analyzed hundreds of flow-cytometry samples on the EPICs, Synechococcos culture care, Synnechococcus spectral measurements.*

**Peacock, E. E.**, R. J. Olson, H. M. Sosik. 2014. Parasitic infection of the diatom *Guinardia delicatula,* a recurrent and ecologically important phenomenon on the New England Shelf. *Marine Ecology Progress Series* 503:1-10.

Hirai, H., Takada, H., Ogata, Y., Rei, Y., Mizukawa, K., Saha, M., Kwan, C., Moore, C., Gray, H., Laursen, D., Zettler, E. R., Farrington, J. W., Reddy, C. M., **Peacock, E. E.**, Ward, M. W. 2011. Organic micropollutants in marine plastic debri from the open ocean and remote urban beaches. *Marine Pollution Bulletin* 62: 1638-1692.

*Role: Prepared marine plastic samples for micropollutant analysis.*

**Peacock, E. E.**, S. J. Arey, J. A. DeMello, A. P. McNichol, R. K. Nelson, C. M. Reddy. 2010. Molecular and isotopic analysis of Motor oil from a biodiesel-driven vehicle. *Energy & Fuels* 24: 1037-1042.

Morét-Ferguson, S., K. L. Law, G. Proskurowski, E. K. Murphy, **E. E. Peacock**, C. M., Reddy. 2010. The size, mass, and composition of plastic debri in the western North Atlantic Ocean. *Marin Pollution Bulletin*, 60: 1873-1878.

*Role: Analyzed hundreds of marine plastic samples for size, mass, and density.*

Law, K. L., S. Morét-Ferguson, N. A. Maximenko, G. Proskurowski, **E. E. Peacock**, J. Hafner, C. M. Reddy. 2010. Plastic Accumulation in the North Atlantic Subtropical Gyre. *Science* 329: 1185-1188.

*Role: Analyzed hundreds of marine plastic samples for size, mass, and density.*

Valentine, D. L., C. M. Reddy, C. Farwell, T. M. Hill, O. Pizarro, D. R. Yoerger, R. Camili, R. K. Nelson, **E. E. Peacock**, S. C. Bagby, B. A. Clarke, C. N. Roman, M. Soloway. 2010. Asphalt volcanoes as a potential source of methane to late Pleistocene coastal waters. *Nature Geoscience* 3: 345-348.

*Role: Analyzed geochemical composition of asphalt volcano material.*

Lemkau, K. L., **E. E. Peacock**, R. K. Nelson, G. T. Ventura, J. L. Kovecses, C. M. Reddy. 2010. The M/V *Cosco Busan* spill: Source identification and short-term fate. *Marine Pollution Bulletin* 60: 2123-2129.

*Role: Worked with primary author to analyze oil samples collected from the San Francisco Bay area.*

Valiela, I., E. Kinney, **E. Peacock** et al. 2009. Global losses of mangroves and salt marshes: magnitudes, causes and consequences. In: Global loss of coastal habitats: Rates Causes and Consequences, Duarte, M. (ed.). Fundacion BBVA, Bilbao, Spain. pp 107-133.

*Role: Used historical aerial photographs and GIS to produce a key figure illustrating the erosion of a salt marsh over decades.*

Farwell, C., Reddy, C. M., **Peacock, E.**, Nelson, R. K., Washburn, L., Valentine, D. L. 2009. Weathering and the fallout plume of heavy oil from strong petroleum seeps near coal oil point, CA. *Environmental Science and Technology* 43: 3542-3548.

*Role: Guided guest student, Chris Farwell, in analysis of petroleum seep samples during his visit to WHOI.*

Culbertson, J.B., I Valiela, M. Pickart, **E. E. Peacock**, and C. M. Reddy. 2008. Long-term consequences of residual petroleum on salt marsh grass. *Journal of Applied* *Ecology* 45: 1284-1292.

*Role: Provided total petroleum hydrocarbons (TPH) content data for the study area.*

Reddy, C. M., J. A. DeMello, C. A. Carmichael, **E. E. Peacock**, L. Xu, and J. S. Arey. 2008. Determination of biodiesel blending percentages using natural abundance radiocarbon analysis: Testing the accuracy or retail biodiesel blends. *Environmental Science and Technology* 42: 2476-2482.

*Role: Collected and prepared samples for radio-carbon analysis; made figures and tables.*

**Peacock, E. E.**, G. R. Hampson, R. K. Nelson, L. Xu, G. S. Frysinger, R. B. Gaines, J. W. Farrington, B. W. Tripp, and C. M. Reddy. 2007. The 1974 spill of the *Bouchard 65* oil barge: Petroleum hydrocarbons persist in Winsor Cove salt marsh sediments. *Marine Pollution Bulletin* 54: 214-225.

DeMello, J. A., C. A. Carmichael, **E. E. Peacock**, R. K. Nelson, J. S. Arey, and C. M. Reddy. 2007. Biodegradation and environmental behavior of biodiesel mixtures in seawater: An initial study. *Marine Pollution Bulletin* 54: 894-904.

*Role: Led summer student Jared DeMello in experimental set up, sample analysis and manuscript preparation.*

Reddy, C. M., R. K. Nelson, S. P. Sylva, L. Xu, **E. E. Peacock**, B. Raghuraman, O. C. Mullins. 2007. Identification and quantification of alkene-based drilling fluids in crude oils by comprehensive two-dimensional gas chromatography with flame ionization detection. *Journal of Chromatography A* 1148: 100-107.

*Role: Analyzed of drilling fluid samples using one-dimensional gas chromatography.*

Culbertson, J. B., **E. E. Peacock**, C. M. Reddy, and I. Valiela. 2007. Long-term biological effects of petroleum: Response of fiddler crabs to oil in salt marsh sediments. *Marine Pollution Bulletin* 54: 955-962.

*Role: Provided total petroleum hydrocarbons (TPH) content data for the study area.*

**Peacock, E. E.**, R. K. Nelson, A. R. Solow, J. D. Warren, J. L. Baker, and C. M. Reddy. 2005. The West Falmouth Oil Spill: ~100 Kg of Oil Found to Persist Decades Later. *Environmental Forensics* 6: 273-281.

## PUBLISHED DATA

Sosik, H. M., **E. E. Peacock**, E. F. Brownlee. 2015. Annotated Plankton Images - Data Set for Developing and Evaluating Classification Methods. <http://hdl.handle.net/10.1575/1912/7341>

## PROFESSIONAL ACTIVITIES

Intensive courses:

Software Carpentry Bootcamp, covering Automating tasks with the Unix shell, Version Control with Git, and programming in Python. Sept 3-4, 2015

2nd International Marine Phytoplankton Identification Course at the Marine Biological Association, Plymouth, England. July 2012.

Presentations:

Parasitic infection of a bloom-forming diatom on the New England Shelf. WHOI Summer Student Fellow seminar series, July, 2014.

The persistence of petroleum hydrocarbons in two Buzzards Bay salt marshes. Spring 2006 NEERS meeting.

The Florida oil spill after 35 years: New insights on the fate of petroleum residues in salt marsh sediments, Connecticut College, Chemistry Department, February 14, 2005.

Posters:

Smith, W. O., D. M. McGillicuddy Jr, E. Olson, H. M. Sosik and **E. Peacock**. A missing Link? Mesoscale distributions of colonial *Phaeocystis antarctica* and its ghost colonies in the Ross Sea. 2016 Ocean Sciences Meeting, 21-26 February 2016, New Orleans, LA, USA. (Poster)

Orenstein, E. C., P. M. Morgado, **E. Peacock**, H. M. Sosik, J. S. Jaffe. Mining big data sets of plankton images: a zero-shot learning approach to retrieve labels without training data. Ocean Sciences Meeting, 21-26 February 2016, New Orleans, LA, USA. (Poster)

E. C. Orenstein, O. Beijbom, **E. Peacock**, H. M. Sosik. WHOI-Plankton: A Large Scale Fine Grained Visual Recognition Benchmark Data Set for Plankton Classification. Fine Grain Visual Categorization Workshop, Boston, MA, 12 June, 2015. (poster)

Sosik, H.M., **E.E. Peacock**, E.T. Crockford, and R.J. Olson. 2016. Seasonal anomalies as proxies for phytoplankton community response to climate trends on a temperate continental shelf. NASA Ocean Color Research Team meeting, Silver Spring, MD, 2-4 May 2016 (poster)

Sosik, H.M., **E.E. Peacock**, E.T. Crockford and R.J. Olson. Seasonal anomalies as proxies for phytoplankton community response to climate trends on a temperate continental shelf. International OCB Summer Workshop, Woods Hole, MA, 20-23 July 2015. (poster)

Sosik, H.M., **E.E. Peacock**, and R.J. Olson. Parasitic infection and regulation of a coastal diatom: Insights from a long duration, high resolution time series of plankton images. Jacques Monod Conference on Marine Eco- systems Biology, Roscoff, France, 21-25 June 2015. (plenary oral)

Sosik, H.M, **E.E. Peacock**, E.T. Crockford and R.J. Olson. Seasonal anomalies as proxies for phytoplankton community response to climate trends on a temperate continental shelf. International Ocean Colour Science Meeting, San Francisco, CA 15-18 June 2015. (poster)

Sosik, H.M, **E.E. Peacock**, and R.J. Olson. Parasitic infection and regulation of a coastal diatom: Insights from a long duration, high resolution time series of plankton images. ASLO Aquatic Sciences Meeting, Granada, Spain, 23-27 February 2015. (oral)

Sosik, H.M., **E.E. Peacock**, and R.J. Olson. Plankton Time Series at the Martha’s Vineyard Coastal Observatory. OCB Summer Workshop, Woods Hole, MA, 21-24 July 2014

**Peacock, E.E**., G.R. Hampson, R.K. Nelson, Li Xu, J. Farrington, B. Tripp, C.M. Reddy. The 1974 spill of the Bouchard 65 oil barge: Petroleum hydrocarbons persist in Winsor Cove salt marsh sediments. 5th Annual Environmental Research Symposium, Bridgewater State College. November 11, 2006. Bridgewater, MA.

**Peacock, E.E**. The 1974 spill of the *Bouchard 65* oil barge: Petroleum hydrocarbons persist in Winsor Cove salt marsh sediments. EPA Fellows Conference in Washington, DC on Sept. 24 – 26, 2006

Outreach:

Under the Waves: WHOI Science in Local Waters. June 7, 2015

Imaging FlowCytobot demonstration.

Committees:

Board member, Salt Pond Areas Bird Sanctuaries, 2011-present.

Graded and Marine Personnel Committee (GMPC), 2012-2013.

Reviewer for journals:

Environmental Science & Technology

Marine Pollution Bulletin