Nicholas E. Ray

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Updated March 5, 2024

Education

Ph.D.	**Biology** (with an Advanced Graduate Certificate in Biogeosciences) Boston University - 2020
M.S.	**Environmental Science and Technology** University of Maryland, College Park - 2014
B.S.	**Environmental Science and Technology** with a focus in Ecological Technology Design University of Maryland, College Park - 2011

Professional Experience

Assistant Professor – University of Delaware, School of Marine Science and Policy	2024 – present
Postdoctoral Associate – Cornell University, Dept. of Ecology & Evolutionary Biology	2021 – 2023
Postdoctoral Fellow – Stockholm University, Dept. of Environmental Science	2020 – 2021
Visiting Scientist – US EPA, Atlantic Ecology Division, Narragansett RI	2017 – 2020
Teaching/Research Fellow – Boston University, Dept. of Biology	2015 – 2020
Program Management Specialist – University of Maryland, Dept. of Environmental Science & Technology	2014 – 2015
Graduate Assistant – University of Maryland, College of Letters and Sciences	2012 – 2014
Faculty Research Assistant – Maryland Sea Grant	2011 – 2013
Project Assistant – Baltimore Ecosystem Study	2012

Honors and Awards

2021 – Marie Skłodowska-Curie Individual Fellowship (*I declined this award*)
2020 – Outstanding Teaching Fellow; Boston University Marine Program
2019 – Graduate Summer Fellow; Frederick S. Pardee Center for the Study of the Longer-Range Future
2017 & 2018 – Warren McLeod Summer Research Fellowship
2016-2020 – Teaching Fellowship; Boston University
2015 – Dean's Fellowship; Boston University
2015 – Outstanding Staff Member; College of Agriculture and Natural Resources, University of Maryland

Publications (*indicates undergraduate student mentee)

Journal Articles

24. **Ray NE**, Martens J, Ajmar M, Tesi T, Yakushev E, Gangnus I, Strauss J, Schirrmeister L, Semiletov I, Wild B. The role of coastal Yedoma deposits and continental shelf sediments in the Arctic Ocean silicon cycle (2024) *Global Biogeochemical Cycles*, *38*, e2023GB007746. https://doi.org/10.1029/2023GB007746

23. Holgerson MA, **Ray NE**, *Russ C (2024) High rates of carbon burial linked to autochthonous production in artificial ponds. *Limnology & Oceanography Letters*, *9*, 43-51. https://doi.org/10.1002/lol2.10351

22. Theus ME, **Ray NE**, Bansal S, Holgerson MA (2023) Submersed macrophyte density regulates aquatic greenhouse gas emissions. *Journal of Geophysical Research: Biogeosciences*, *128*, e2023JG007758. http://dx.doi.org/10.1029/2023JG007758

21. **Ray NE**, Holgerson MA (2023) High intra-seasonal variability in greenhouse gas emissions from temperate constructed ponds. *Geophysical Research Letters*, *50*, e2023GL104235. https://doi.org/10.1029/2023GL104235

20. **Ray NE**, Holgerson MA, Andersen MR, Bikse J, Bortolotti L, Futter M, Kokorite I, Law A, McDonald C, Mesman J, Peacock M, Richardson DC, Arsenault J, Bansal S, Cawley K, Finlay K, Kuhn M, Shahabinia AR, Smufer S (2023) Spatial and temporal variability in summertime dissolved carbon dioxide and methane in temperate ponds and shallow lakes. *Limnology & Oceanography*, *68*, 1530-1545. http://dx.doi.org/10.1002/lno.12362

19. Wild B, **Ray NE**, Lett C, Davies AJ, Kirillova E, Holmstrand H, Klevantceva E, Osadchiev A, Gangnus I, Yakushev E, Kosmach D, Dudarev O, Gustafsson Ö, Semiletov I, Brüchert V (2023) Nitrous oxide dynamics in the Siberian Arctic Ocean and vulnerability to climate change. *Journal of Geophysical Research: Biogeosciences*, *128*, e2022JG007326. https://doi.org/10.1029/2022JG007326

18. Rotjan RD & **Ray NE**, Cole I, Castro KG, Kennedy BRC, Barbasch T, Lesneski KC, Scavo Lord K, Bhardwaj A, Edens M, Karageorge I, Klawon C, Kruh-Needleman H, McCarthy G, Perez R, Roberts C, Trumble IF, Volk A, Torres J, Morey J (2022) Shifts in predator behavior following climate induced disturbance on coral reefs. *Proceedings of the Royal Society B*, *289*, *20221431*. https://doi.org/10.1098/rspb.2016.0049.
**(Rotjan and Ray are co-first authors; 12 co-authors are undergraduate students)*

17. Yacano MR, Foster SQ, **Ray NE**, Oczkowski A, Raven JA, Fulweiler RW (2022) Marine macroalgae are an overlooked sink of Si in coastal systems. *New Phytologist*, *233*, 2330-2336. https://doi.org/10.1111/nph.17889

16. Ayvazian SG, **Ray NE**, Gerber-Williams A, Grabbert S, Pimenta A, Hancock B, Cobb D, Strobel C, Fulweiler RW (2022) Evaluating connections between nitrogen cycling and the macrofauna in native oyster beds in a New England Estuary. *Estuaries and Coasts*, *45*, 196-212. https://doi.org/10.1007/s12237-021-00954-x

15. **Ray NE**, Fulweiler RW (2021) Negligible greenhouse gas release from sediments in oyster habitats. *Environmental Science & Technology*, *55*, 14225-14233. https://doi.org/10.1021/acs.est.1c05253

14. **Ray NE**, Hancock B, Brush MJ, Colden A, Cornwell J, Labrie M, Maguire TJ, Maxwell T, Rogers D, Stevick RJ, Unruh A, Kellogg L, Smyth A, Fulweiler RW (2021) A review of how we assess denitrification in oyster habitats and proposed guidelines for future studies. *Limnology and Oceanography: Methods*, *19*, 714-731. https://doi.org/10.1002/lom3.10456

13. **Ray NE,** Al-Haj AN, Maguire TJ, *Henning MC, Fulweiler RW (2021) Coastal silicon cycling amplified by oyster aquaculture. *Marine Ecology Progress Series*, *673*, 29-41. https://doi.org/10.3354/meps13803

12. DiRoberts LE, Dudek A, **Ray NE**, Fulweiler RW, Rotjan RD (2021) Testing assumptions of nitrogen cycling between a temperate, model coral host and its facultative symbiont: symbiotic contributions to dissolved inorganic nitrogen assimilation. *Marine Ecology Progress Series*, *670*, 61-74. https://doi.org/10.3354/meps13731

11. Mazur CI, Al-Haj AN, **Ray NE**, Sanchez-Viruet I, Fulweiler RW (2021) Low denitrification rates and variable benthic nutrient fluxes characterize Long Island Sound sediments. *Biogeochemistry*, *154*, 37-62. https://doi.org/10.1007/s10533-021-00795-7

10. **Ray NE**, Fulweiler, RW (2021) Meta-analysis of oyster impacts on coastal biogeochemistry. *Nature Sustainability*, *4*, 261-269. https://doi.org/10.1038/s41893-020-00644-9

9. Wilson S, Al-Haj A, Bourbonnais A, Frey C, Fulweiler R, Kessler J, Marchant H, Milucka J, **Ray NE**, Suntharalingham P, Thornton B, Upstill-Goddard R, Weber T, Arévalo-Martínez D, Chang B, Crill P, del Valle D, Farías L, Kock A, Labidi J, Manning C, Pohlman J, Rehder G, Sparrow K, Tortell P, Treude T,

Valentine D, Ward B, Yang S, Yurganov L, Bange H, Benway H, Bianchi D, Borges A, Joye S (2020) Ideas and perspectives: A strategic assessment of methane and nitrous oxide measurements in the marine environment. *Biogeosciences, 17*, 5809-5828. https://doi.org/10.5194/bg-17-5809-2020

8. **Ray NE**, Fulweiler RW (2020) Seasonal patterns of benthic-pelagic coupling in oyster habitats. *Marine Ecology Progress Series, 652*, 95-109. https://doi.org/10.3354/meps13490
7. **Ray NE**, Al-Haj AN, Fulweiler RW (2020) Sediment biogeochemistry along an oyster aquaculture chronosequence. *Marine Ecology Progress Series, 646*, 13-27. https://doi.org/10.3354/meps13377
6. *McCarthy GJ, **Ray NE**, Fulweiler RW (2019) Greenhouse gas emissions from native and non-native oysters. *Frontiers in Environmental Science*, 7:94. https://doi.org/10.3389/fenvs.2019.00194
5. **Ray NE,** Maguire TJ, Al-Haj AN, *Henning MC, Fulweiler RW (2019) Low greenhouse gas emissions from oyster aquaculture. *Environmental Science and Technology, 53*, 9118-9127. https://doi.org/10.1021/acs.est.9b02965
4. **Ray NE**, *Henning MC, Fulweiler RW (2019) Nitrogen and phosphorus cycling in the digestive system and shell biofilm of the Eastern oyster *Crassostrea virginica*. *Marine Ecology Progress Series, 621*, 95-105. https://doi.org/10.3354/meps13007
3. **Ray NE**, O'Meara T, Williamson T, Izursa JL, Kangas PC (2018) Consideration of carbon dioxide release during shell production in LCA of bivalves. *The International Journal of Life Cycle Assessment, 23*, 1042-1048. https://doi.org/10.1007/s11367-017-1394-8
2. **Ray NE**, Li J, Kangas PC, Terlizzi DE (2015) Water quality upstream and downstream of a commercial oyster aquaculture facility in Chesapeake Bay, USA. *Aquacultural Engineering, 68*, 35-42. https://doi.org/10.1016/j.aquaeng.2015.08.001
1. **Ray NE**, Terlizzi DE, Kangas PC (2015) Nitrogen and phosphorus removal by the algal turf scrubber at an oyster aquaculture facility. *Ecological Engineering, 78*, 27-32. https://doi.org/10.1016/j.ecoleng.2014.04.028

Theses & Dissertations

Ray NE (2020) Oyster Regulation of Biogeochemical Cycling in Temperate Estuaries. PhD Dissertation. Boston University. 212 pp. https://hdl.handle.net/2144/41663

Ray NE (2014) Toward the Development of Integrated Oyster-Algae Aquaculture in the Chesapeake Bay. MS thesis. University of Maryland – College Park. 78 pp. http://hdl.handle.net/1903/15498

Bulletins & Popular Press

1. Ghosh A, Robison RL, Chiapella AM, Bertolet BL, Selden C, Perry D, Reich HG, Oleksy I, Isanta-Navarro, Aho KS, Ganley L, Soares LMV, Heffernan L, Peleg O, Ramulifho PA, Thibodeau P, Reis PCJ, Sasaki M, **Ray NE**, Maher RL, LaBrie R, Speir SL (2022) Eco-DAS: an effective platform for developing professional collaborations among early career aquatic scientists. *Limnology & Oceanography Bulletin, 31*, 27-29.

Presentations & Seminars

Invited Presentations & Seminars

2024 The biogeochemical consequences of marine fisheries and aquaculture – A plethora of considerations. Rutgers University

2023 A key role of suspension-feeding bivalves in coastal carbon cycling. American Geophysical Union Fall 2023 Meeting, San Francisco, CA, USA.

2023 From ponds to continental shelves – Aquatic biogeochemistry in the Anthropocene. University of Delaware, School of Marine Science & Policy.

2023 From ponds to continental shelves – Aquatic biogeochemistry in the Anthropocene. Tulane University, Department of Earth and Environmental Sciences.

2022 Animal regulation of aquatic greenhouse gas cycling. Cornell University Biogeochemistry Seminar Series. Cornell University, Ithaca, NY.

2022 Trophic regulation of aquatic greenhouse gas emissions. Asa Gray Seminar Series, Utica College, Utica, NY.

2020 Sediment denitrification in oyster habitats and the future of coastal biogeochemical sustainability. 112th Annual Meeting of the National Shellfisheries Association. Baltimore, MD. (canceled due to Coronavirus pandemic)

2019 Changing oyster populations and coastal biogeochemistry in New England. New England Aquarium Dive Club. Boston, MA.

2019 Sediment denitrification in oyster habitats: a meta-analysis and future research directions. Workshop on Synthesizing the Nitrogen Removal Capacity of Oyster Habitats via Denitrification. The Frederick S. Pardee Center for the Study of the Longer Range Future. Boston University, Boston, MA.

2016 Oyster control of coastal phytoplankton communities. Fluid Imaging Technologies. Yarmouth, ME.

*Conference Posters and Presentations (*indicates undergraduate student mentee)*

2023 **Ray NE**, Canino T, Holgerson MA, Grodsky S. Effect of floating solar installation on greenhouse gas emissions from ponds. American Geophysical Union Fall 2023 Meeting, San Francisco, CA, USA.

2023 Pacheco F, Heilpern S, Almeida R, Barbosa I, Barros NO, Cavali J, Delbert AP, da Costa Doria CR, Fan J, Forsberg B, Greenstreet L, Oliveira I, Miranda M, **Ray NE**, Sethi S, Soranço L, Ummus ME, Ometto JP, Gomes C, Flecker A. Unaccounted land and carbon footprint of aquaculture in the Amazon. American Geophysical Union Fall 2023 Meeting, San Francisco, CA, USA.

2023 **Ray NE**, Cooper P, Heathcote AJ, Anderson NJ, Villa J, Downing J, Holgerson MA. An updated estimate of the global lentic carbon sink. ASLO Aquatic Sciences Meeting 2023. Palma de Mallorca, Spain.

2023 Holgerson MA, Heathcote A, **Ray NE**. Contrasting mixing regimes alter greenhouse gases and carbon sequestration in temperate ponds. ASLO Aquatic Sciences Meeting 2023. Palma de Mallorca, Spain.

2023 Theus M, **Ray NE**, Holgerson MA. Effects of submersed macrophyte density on methane and carbon dioxide dynamics. ASLO Aquatic Sciences Meeting 2023. Palma de Mallorca, Spain.

2023 Stenehjem K, **Ray NE**, Holgerson MA. Mixing events impact greenhouse gas concentrations in ponds. ASLO Aquatic Sciences Meeting 2023. Palma de Mallorca, Spain.

2023 Sauerland L, **Ray NE**, Tesi T, Dudarev O, Gustafsson Ö, Semiletov I, Wild B. Organic matter degradation and dissolved inorganic carbon production in Siberian Arctic Ocean shelf sediments. European Conference on Permafrost 2023. Puigcerdà, Spain.

2023 Wild B, **Ray NE**, Kirillova E, Gangnus I, Yakushev E, Kosmach D, Dudarev O, Gustafsson Ö, Semiletov I, Brüchert V. Nitrogen dynamics in the Siberian Arctic Ocean and impact of permafrost thaw. European Conference on Permafrost 2023. Puigcerdà, Spain.

2022 **Ray NE**, Holgerson MA. Trophic cascade regulates pond greenhouse gas emissions. American Geophysical Union Fall Meeting 2022. Chicago, IL, USA.

2022 Speir S, Robison E, Aho K, Bertolet B, Ghosh A, Heffernan L, LaBrie R, Maher R, **Ray N**, Reis P. Biogeochemical controls on bacterial communities and gene diversity across US streams. Hacking Limnology 2022. DSOS and AEMON-J Virtual Summit.

2022 **Ray NE**, Holgerson MA. Annual survey of greenhouse gas emissions from constructed ponds. Joint Aquatic Sciences Meeting. Grand Rapids, MI, USA.

2022 Theus M, **Ray NE**, Holgerson MA. Effects of submersed macrophytes on aquatic methane flux. Joint Aquatic Sciences Meeting. Grand Rapids, MI, USA.

2022 Kelly PT, Taylor JM, Andersen IM, Scott T, Holgerson MA, **Ray NE**. Increased N_2O concentrations and emissions from subtropical hypereutrophic mesocosms undergoing N fertilization. Joint Aquatic Sciences Meeting. Grand Rapids, MI, USA.

2022 Wild B, Brüchert V, **Ray NE**, Lett C, Davies AJ, Kirillova E, Holmstrand H, Klevantceva E, Osadchiev A, Gangnus I, Yakushev E, Kosmach D, Dudarev O, Gustafsson Ö, Semiletov I, Nitrous oxide dynamics on the Siberian Arctic Ocean shelves. European Geophysical Union General Assembly, Vienna, Austria.

2021 **Ray NE**. Biogeochemical sustainability in aquatic ecosystems: A definition, examples, and societal implications. Eco-DAS XIV Symposium. Virtual Meeting.

2021 **Ray NE**, Holgerson MA. Drivers of spatial and temporal variance in pond greenhouse gas concentrations. GLEON 2021 All Hands Meeting. Virtual Meeting.

2021 **Ray NE**, Holgerson MA. Controls on mean greenhouse gas emissions and emission variance from ponds in a suburban habitat mosaic. ASLO Aquatic Sciences Meeting. Virtual Meeting.

2021 Stevens JTE, **Ray NE**, Al-Haj AN, Fulweiler RW, Chowdhury PR. Oyster aquaculture enhances sediment microbial diversity – Insights from a multi-omics study. New Hampshire Sea Grant Symposium.

2020 *****McCarthy GJ, **Ray NE**, Fulweiler RW. Oysters, nutrient regeneration, and alternative phytoplankton community states. 112th Annual Meeting of the National Shellfisheries Association. Baltimore, MD, USA. (canceled due to Coronavirus pandemic)

2020 **Ray NE**, Fulweiler RW. Factors regulating sediment methane and nitrous oxide production and consumption in northern temperate estuaries. Ocean Sciences Meeting. San Diego, CA.

2019 **Ray NE**, Al-Haj AN, Fulweiler RW. Oyster aquaculture introduces chaos to sediment nitrogen cycling processes. Ecological Society of America Annual Meeting. Louisville, KY.

2019 DiRoberts L, Dudek A, **Ray NE**, Fulweiler RW, Rotjan RD. Nitrogen cycling in the temperate Northern Star Coral, *Astrangia poculata*: Distinguishing autotrophic from heterotrophic nutrient contributions. *Astrangia* Research Workshop, Bristol RI.

2019 **Ray NE**, Al-Haj AN, Fulweiler RW. Does oyster aquaculture drive sediment nitrogen cycling processes to chaos? New England Estuarine Research Society Spring 2019 Meeting. York Harbor, ME.

2019 *Laaker EM, **Ray NE**, Oczkowski AJ, Fulweiler RW. Trace metal concentrations in *Mercenaria mercenaria* from Narragansett Bay. New England Estuarine Research Society Spring 2019 Meeting. York Harbor, ME.

2019 *McCarthy GJ, **Ray NE**, Fulweiler RW. Native and non-native oysters as a source of nitrous oxide but not methane in a New England estuary. New England Estuarine Research Society Spring Meeting. York Harbor, ME.
- Awarded the Rankin Prize for best undergraduate student oral presentation.

2019 Fulweiler RW, **Ray NE**, Al-Haj AN. Oyster habitat metabolism in RI coastal waters. Rhode Island Sea Grant, Narragansett, RI.

2019 **Ray NE**, Fulweiler RW. Nitrogen cycling along an oyster aquaculture chronosequence. Boston University Biogeoscience Symposium, Boston, MA.

2018 *McCarthy GJ, **Ray NE**, Fulweiler RW. Greenhouse gas fluxes in a native and non-native oyster species. Boston University Undergraduate Research Opportunities Program Fall Symposium. Boston, MA.

2018 **Ray NE**, Al-Haj AN, *Babu MH, *Henning MC, *Scott E, *Momyer V, Fulweiler RW. Oyster aquaculture alters estuarine silica pools and fluxes. Ocean Sciences Meeting. Portland, OR.

2018 **Ray NE**, Fulweiler RW. Does oyster-mediated sediment nutrient regeneration influence phytoplankton community structure? Boston University Biogeoscience Symposium, Boston, MA.
- *Awarded "Symposium Outstanding Presentation"*

2017 **Ray NE**, Fulweiler RW. Does oyster-mediated sediment nutrient regeneration influence phytoplankton community structure? 24th Biennial Conference of the Coastal and Estuarine Research Federation. Providence, RI.

2017 **Ray NE**, *Henning MC, Al-Haj AN, Maguire TJ, Fulweiler RW. Oysters as a high protein, low greenhouse gas food: Emissions of N_2O and CH_4 from oyster aquaculture. Boston University Biology Graduate Student Association Symposium. Boston, MA.

2017 **Ray NE**, *Henning MC, Al-Haj AN, Maguire TJ, Fulweiler RW. Oysters as a high protein, low greenhouse gas food: Emissions of N_2O and CH_4 from oyster aquaculture. Boston University Biogeoscience Symposium. Boston, MA.

2016 **Ray NE**, *Henning MC, Al-Haj AN, Fulweiler RW. N_2O and CH_4 fluxes from oyster aquaculture. New England Estuarine Research Society Fall 2016 Meeting. Block Island, RI.

2016 **Ray NE**, Al-Haj A, Fulweiler RW. *In situ* measurements of nitrogen cycling across an oyster aquaculture chronosequence. Boston University Biogeoscience Symposium. Boston, MA.

2016 **Ray NE**, Al-Haj AN, Fulweiler RW. *In situ* measurements of nitrogen cycling across an oyster aquaculture chronosequence. Ocean Sciences Meeting. New Orleans, LA.

2013 **Ray NE,** Terlizzi D, Kangas PC. Integration of oyster aquaculture and the algal turf scrubber for increased water quality improvement. Maryland Water Monitoring Council Annual Conference. North Linthicum, MD.

2013 **Ray NE,** Terlizzi D, Kangas PC. Upstream and downstream water quality near an oyster aquaculture facility. 22nd Biennial Conference of the Coastal and Estuarine Research Federation. San Diego, CA.

2013 May P, Streb C, Kangas P, **Ray NE,** Salladin B, Ganser A, Lindquis A. A comparison of the nutrient removal efficiencies of two ecologically engineered systems deployed on Baltimore Harbor in 2012. American Ecological Engineering Society Annual Meeting. East Lansing, MI.

2013 Kangas PC, May P, **Ray NE**. Controlled algal growth for water quality improvement on the Baltimore Inner Harbor. American Ecological Engineering Society Annual Meeting. East Lansing, MI.

2013 **Ray NE**, Terlizzi D, Kangas PC. Oyster aquaculture and the algal turf scrubber – a potential method for nutrient removal in the Chesapeake Bay. American Ecological Engineering Society Annual Meeting. East Lansing, MI.

2013 **Ray NE**. Ecosystem services of an oyster aquaculture facility: a case study on Maryland's Eastern Shore. Ecosystem Services Symposium, University of Maryland College of Agriculture and Natural Resources, Wye Research and Education Center, Queenstown, MD.

2011 Kohler A, **Ray NE**, Ball J, Harraka M, Price A, Kangas PC. Experiments in macroalgal culture in the Chesapeake Bay. American Ecological Engineering Society Annual Meeting. Asheville, NC.

Research Funding

Previous Awards

"Nitrous oxide production in a changing Arctic Ocean". Funding from Marie Skłodowska-Curie Actions Individual Fellowship (EU Horizon 2020 Programme); 3/2021-2/2023. Approved for €191,852
**(I declined this award as I had recently moved to a new position at Cornell University)*

"Travel grant". Funding from Boston University Department of Biology, 2020. Awarded $500

"Meta-analysis and model development for inclusion of oyster-mediated sediment denitrification in nutrient management plans and trading schemes" Funding from Frederick S. Pardee Center for the Study of the Longer-Range Future. 5/2019 - 8/2019. Awarded $6000

"Storer Scholarship". Funding from Boston Malacological Club. 2019. Awarded $150.

"Travel grant". Funding from Boston University Department of Biology, 2019. Awarded $500

"Quantifying the fate of nitrogen in oyster habitats." Funding from Boston University Marine Program. 5/2018-8/2018. Awarded $10750

"Teaching as Research Fellowship - Does student knowledge that they are producing data to be used in a long-term data set promote effort, learning, and retention in an upper level biology course" Funding from Boston University (through the National Science Foundation and the Great Lakes Higher Education Foundation). 9/2017-12/2017. Awarded $1000

"Travel grant". Funding from Boston University Department of Biology, 2017. Awarded $500

"Modeling the role of oysters in past, present, and future coastal biogeochemical processing". Funding from Boston University Biogeosciences Program. 8/2017. Awarded $500

"The changing role of oysters in coastal biogeochemical cycling" Funding from Boston University Marine Program. 5/2017-8/2017. Awarded $10500

"Does oyster mediated trace metal cycling promote nitrogen fixation by cyanobacteria?". Funding from Sigma Xi. 2/2016-12/2016. Awarded $987

"Bivalve control of coastal phytoplankton communities". Funding from Fluid Imaging Technologies Inc. 5/2016-9/2016. Awarded training and use of a FlowCam VS-IV for 4 months; Paid travel to the 2017 Coastal and Estuarine Research Federation Meeting

Courses Taught as Lead Instructor (LI), Teaching Assistant (TA), or Teaching Fellow (TF):

Fall 2019	BI539 – ***Coral Reef Dynamics*** (TF; 12 students; intensive month long course at Boston University with a 10-day field research component at Calabash Caye Field Station on Turneffe Atoll, Belize)
Spring 2019	BI260 – ***Marine Biology*** (TF; 37 students in 4 discussion sections; Boston University)
Spring 2018	BI260 – ***Marine Biology*** (TF; 50 students in 4 discussion sections; Boston University)
Fall 2017	BI306 – ***Biology of Global Change*** (TF; 43 students in 2 lab sections; Boston University)
Spring 2017	BI260 – ***Marine Biology*** (TF; 45 students in 3 discussion sections; Boston University)
Fall 2016	BI306 – ***Biology of Global Change*** (TF; 42 students in 2 lab sections; Boston University)
Spring 2016	BI260 – ***Marine Biology*** (TF; 42 students in 4 discussion sections; Boston University)
Spring 2014	ENST452 – ***Wetland Creation and Restoration*** (TA; 33 students; University of Maryland)
Fall 2013	UNIV100 – ***The Student in the University*** (LI; 20 students; University of Maryland)
Fall 2013	ENST373 – ***Natural History of the Chesapeake Bay*** (TA; 49 students; University of Maryland)
Fall 2012	UNIV100 – ***The Student in the University*** (LI; 19 students; University of Maryland)

Student Mentoring

Undergraduates (14 supervised in lab and 6 mentored on individual research projects)

1. Maria Henning – Honors Thesis (Boston University, 2015-2016)

2. Maya Babu – Directed Study (Boston University, 2016-2017)
   - Earned M.S. at University of Maryland, 2020 (advised by P. Leisnham)
   - Currently at US EPA
3. Gretchen McCarthy – Senior Thesis and Directed Study (Boston University, 2017-2020)
   - Currently Ph.D. student at University of Otago, New Zealand (advised by S. Wing)
   - Boston University Marine Program Lara Vincent Award for most outstanding Senior Thesis 2020
   - NOAA Hollings Scholar 2018
4. Ellen Laaker – Directed Study (Boston University, 2018-2019)
   - Currently M.S. student at Texas A&M University (advised by E. Estes & J. Sylvan)
5. Shraddha Pingali – Directed Study (Boston University, 2019 – 2021)
   - NOAA Hollings Scholar 2020
6. Chelsea Russ – Summer Research (Cornell University, 2021)
7. Peri Cooper – Summer/Continuing Research (Cornell University, 2022 – present)

Professional Service & Outreach

Department Level (Past 5 years)

(2024-present) Graduate Curriculum Committee – School of Marine Science & Policy, University of Delaware

(2022-2023) Meeting Coordinator – Limnology Lab Group, Cornell University

(2022-present) Department Belonging Committee, Cornell University, Dept. of Ecology & Evolutionary Biology

(2015-2020) Student Rep at Faculty Meetings – Boston University Biology Graduate Student Association

(2015-2020) Seminar Speaker Selection Committee - Biogeosciences Program, Boston University

(2019) Global Change Biology Faculty Search Committee – Boston University, Biology Dept.

Conference Related (Past 5 years)

(2023) Chair session "Old carbon, new ideas – Recent advances in lentic carbon burial" at ASLO Meeting

(2022) Co-chair session "Ponds and shallow lakes: ecosystem processes" at Joint Aquatic Sciences Meeting

(2021) Co-chair session "Greenhouse Gas Dynamics in the Coastal Ocean – Emerging Trends and Future Directions" at Aquatic Sciences Meeting

(2020) Co-chair session "Oysters and nitrogen removal via denitrification" at National Shellfisheries Association Meeting **(Canceled due to Coronavirus pandemic)

(2019) Chair session "Sediment and Water Quality" at New England Estuarine Research Society spring meeting

Journal Article Review Activity (Past 5 years)

Agriculture, Ecosystems, & Environment (2023 – 1)
Aquaculture (2021 – 2)
Biogeochemistry (2021 – 1)
Environmental Science & Technology (2021 – 1; 2022 – 1)
Estuaries and Coasts (2021 – 1)
Freshwater Science (2020 – 1)
Geophysical Research Letters (2021 – 1; 2023 – 1)
Global Biogeochemical Cycles (2022 – 1; 2023 – 1)
Global Change Biology (2022 – 1)
Limnology & Oceanography (2021 – 1; 2023 – 1)
Limnology & Oceanography Letters (2022 – 1; 2023 – 1)

Marine Ecology Progress Series (2019 – 1)
Reviews in Aquaculture (2022 – 1)
Science of the Total Environment (2019 – 1, 2021 – 2)

Funding Review

New Jersey Sea Grant (2021)
Georgia Sea Grant (2023)

Outreach

(2020) Panelist "Alumni Advice: Navigating Your Career During Uncertain Times". College of Agriculture and Natural Resources, University of Maryland

(2019) Speaker for classes at Brookline High School (MA) about greenhouse gas production during food production

(2018) Boston University Earth House - Discussion of greenhouse gas costs of food production

(2016) Speaker; "Current research and how I got to BU". Boston University Marine Science Club.

Affiliations/Memberships

American Geophysical Union
Association for the Sciences of Limnology and Oceanography
Coastal and Estuarine Research Federation
Sigma Xi