

SARAH QUINN FOSTER

Postdoctoral Teaching Fellow / Math and Science Division / Babson College
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EDUCATION

Boston University – Boston, MA PhD, Earth & Environment Graduate Certificate in Biogeosciences <i>Advisor: Robinson W. Fulweiler</i>	Graduated 2019
Boston University – Boston, MA MA, Earth Sciences <i>Advisor: Robinson W. Fulweiler</i>	Graduated 2012
Hampshire College – Amherst, MA BA, Ecosystems Ecology and Environmental Science <i>Advisor: Charlene D'Avanzo</i>	Graduated 2006
Phillips Exeter Academy – Exeter, NH High school diploma awarded with Cum Laude distinction	Graduated 2000

WORK EXPERIENCE

Postdoctoral Teaching Fellow Math and Science Division, Babson College – Babson Park, MA	Aug 2020–present
Adjunct Professor, Oceanography Math and Science Division, Babson College – Babson Park, MA	Jan 2020–Jul 2020
Adjunct Professor, Introduction to Oceanography Earth & Environment Department, Boston University – Boston, MA	Sep–Dec 2019
Biologist (GS-09-02), Field and Lab Technician United States Geological Survey (USGS) – Menlo Park, CA <i>Supervisor: James Cloern</i>	Jun 2006–2010
Coastal Biogeochemistry Research Intern Ecosystems Center, Marine Biological Laboratory – Woods Hole, MA <i>Supervisor: Anne Giblin</i>	Jun–Aug 2005
Environmental Biology Research Intern University of Southern California, Wrigley Institute for Environmental Studies – Los Angeles, CA <i>Supervisor: Doug Capone</i>	Jun–Aug 2004

RESEARCH FELLOWSHIPS

National Defense Science and Engineering Graduate (NDSEG) Fellowship

Apr 2014 (Awarded), Sep 2014–2017 (Fellowship Tenure)

Environmental Protection Agency Science to Achieve Results (STAR) Fellowship for Graduate Study in Environmental Science

Apr 2014 (Awarded and Declined due to funding from NDSEG)

TEACHING FELLOWSHIPS

Teaching Fellow, Introduction to Oceanography
Boston University – Boston, MA

Sep–Dec 2010, 2012 & 2018

Teaching Fellow, Introduction to Environmental Science
Boston University – Boston, MA

Jan–May 2013

Teaching Fellow, Environmental Earth Science
Boston University – Boston, MA

Jan–May 2011

Teaching Assistant, Watershed Ecology
Hampshire College – Amherst, MA

Sep–Dec 2005

PUBLICATIONS

Foster SQ and RW Fulweiler. (*In Preparation for Frontiers in Marine Science*). Thresholds of hypoxia and greenhouse gas fluxes in a coastal marine ecosystem.

Foster SQ, Maguire TJ, and RW Fulweiler. (*In Preparation for Limnology and Oceanography*). Long-term trends in the frequency and phenology of coastal hypoxia vary with estuary type.

Yacono M, **Foster SQ**, Ray NE, Oczkowski A, Raven J, and RW Fulweiler. (*In Preparation for New Phytologist*), Silica uptake in temperate marine macroalgae: an overlooked sink in coastal systems.

Fulweiler RW, Maguire T, Heiss EM, and **SQ Foster**. (*In Preparation*). Extreme warming decreases continental shelf sediment denitrification.

Foster SQ and RW Fulweiler. 2019. Estuarine sediments exhibit dynamic and variable biogeochemical responses to hypoxia. *Journal of Geophysical Research: Biogeosciences*, 124. <https://doi.org/10.1029/2018JG004663>

Zakem EJ, Al-Haj A, Church MJ, van Dijken GL, Dutkiewicz S, **Foster SQ**, Fulweiler RW, Mills MM, and MJ Follows. 2018. Ecological control of nitrite in the upper ocean. *Nature Communications*, 9 (1): 1206. doi:10.1038/s41467-018-03553-w <https://www.nature.com/articles/s41467-018-03553-w>

Foster SQ and RW Fulweiler. 2016. Sediment nitrous oxide fluxes are dominated by uptake in a temperate estuary. *Frontiers in Marine Science – Marine Ecosystems Ecology*, 3:40. doi: 10.3389/fmars.2016.00040 <http://journal.frontiersin.org/article/10.3389/fmars.2016.00040/full>

Newell SE, Pritchard KR, **Foster SQ**, and RW Fulweiler. 2016. Molecular evidence for sediment nitrogen fixation in a temperate New England estuary. *PeerJ* 4:e1615 <https://doi.org/10.7717/peerj.1615>

Foster SQ and RW Fulweiler. 2014. Spatial and historic variability of benthic nitrogen cycling in an anthropogenically impacted estuary. *Frontiers in Marine Science – Global Change and the Future Ocean*, 1:56. doi:10.3389/fmars.2014.00056 http://www.frontiersin.org/global_change_and_the_future_ocean/10.3389/fmars.2014.00056/abstract

Cloern JE, **Foster SQ**, and AE Kleckner. 2014. Review: Phytoplankton primary production in the world's estuarine-coastal ecosystems. *Biogeosciences*, 11: 1-25. doi:10.5194/bg-11-1-2014. <http://www.biogeosciences.net/11/2477/2014/>

DISSERTATION & THESES

Foster SQ. 2019. The Biogeochemical response of shallow estuarine ecosystems to coastal hypoxia. Doctoral dissertation in Earth & Environment, Boston University, Boston, MA.
Advisor: Robinson W. Fulweiler (Boston University)

Foster SQ. 2012. Denitrification and nutrient cycling dynamics over a trajectory of increasing eutrophication. Master of Arts thesis in Earth Sciences, Boston University, Boston, MA.
Advisor: Robinson W. Fulweiler (Boston University)

Foster SQ. 2006. Eutrophication in Coastal Ecosystems: A study of biogeochemical nitrogen cycling. Bachelor of Arts thesis in Environmental Science and Ecosystems Ecology, Hampshire College, Amherst, MA.
Advisors: Charlene D'Avanzo (Hampshire College), Nancy Lowry (Hampshire College), Anne Giblin (Ecosystems Center, Marine Biological Laboratory)

PRESENTATIONS (*denotes award)

Foster SQ and RW Fulweiler. 2018. Impacts of hypoxia on sediment biogeochemical fluxes in a shallow New England estuary. Poster presentation *at the* Woods Hole Sea Grant Research Showcase, WHOI Ocean Science Discovery Center, Woods Hole, Massachusetts, USA.

Foster SQ and RW Fulweiler. 2017. Impacts of hypoxia on sediment biogeochemical fluxes in a shallow New England estuary. Poster presentation *at the* Coastal and Estuarine Research Federation 24th Biennial International Conference, Providence, Rhode Island, USA.

Foster SQ and RW Fulweiler. 2016. Assessment of sediment nitrous oxide fluxes from a shallow temperate estuary. Poster presentation *at the* Biogeoscience Symposium, Boston University, Boston, Massachusetts, USA.

Foster SQ and RW Fulweiler. 2015. Assessment of sediment nitrous oxide fluxes from a shallow temperate estuary. Poster presentation *at the* Coastal and Estuarine Research Federation 23rd Biennial International Conference, Portland, Oregon, USA.

***Foster SQ** and RW Fulweiler. 2015. Environmental controls on sediment nitrous oxide flux in an anthropogenically impacted coastal marine ecosystem. Oral presentation *at the* New England Estuarine Research Society Spring Meeting, Bristol, Rhode Island, USA.

Balmonte JP, **Foster SQ**, Molina MR, James A, and A Bramucci. 2014. See more sea with C-MORE: Merits of the 2013 summer course “Microbial Oceanography: Genomes to Biomes”. Poster presentation *at the* Association of the Sciences in Limnology and Oceanography Ocean Sciences Meeting, Honolulu, Hawai’i, USA.

Foster SQ and RW Fulweiler. 2013. Trends in Sediment Nutrient Regeneration and Ecosystem Metabolism in Waquoit Bay, Massachusetts. Oral presentation *at the* Coastal and Estuarine Research Federation 22nd Biennial International Conference, San Diego, California, USA.

Foster SQ and RW Fulweiler. 2013. Effects of increasing eutrophication on sediment N₂O and N₂ fluxes in a shallow, coastal ecosystem. Oral presentation *at the* Association of the Sciences in Limnology and Oceanography Aquatic Sciences Meeting, New Orleans, Louisiana, USA.

Foster SQ and RW Fulweiler. 2012. Net N₂ flux and nitrogen cycling dynamics over a trajectory of increasing eutrophication. Oral presentation *at the* New England Estuarine Research Society Meeting, Block Island, Rhode Island, USA.

Foster SQ and RW Fulweiler. 2011. Effect of low oxygen on nitrous oxide flux in Waquoit Bay, Massachusetts. Oral presentation *at the* Coastal and Estuarine Research Federation 21st Biennial International Conference, Daytona Beach, Florida, USA.

Foster SQ, Phillips C, Schraga T, and JE Cloern. 2009. Four decades of water quality research in San Francisco Bay. Poster presentation *at the* Coastal and Estuarine Research Federation 20th Biennial International Conference, Portland, Oregon, USA.

Foster SQ, Phillips C, Schraga T, and JE Cloern. 2008. Forty years of water quality research in San Francisco Bay. Poster presentation *at the* CALFED Science Biennial Conference, Sacramento, California, USA.

Foster SQ and JE Cloern. 2007. Are estuaries as productive as we think? : A Comparative analysis of estuarine phytoplankton productivity. Oral presentation *at the* Estuarine Research Federation 19th Biennial International Conference, Providence, Rhode Island, USA.

****Foster SQ** and AE Giblin. 2006. Influence of a eutrophic gradient and *Zostera marina* on nitrification-denitrification in a shallow estuary. Oral presentation *at the* New England Estuarine Research Society Annual Conference, Hull, Massachusetts, USA.

Foster SQ, Sohm J, and D Capone. 2005. Nitrogen fixation associated with the Giant Kelp, *Macrocystis pyrifera* in southern California coastal waters. Poster presentation *at the* American Society of Limnology and Oceanography Aquatic Sciences Meeting, Salt Lake City, Utah, USA. Project continued and later published by the Capone Lab, doi:10.1016/j.aquabot.2015.05.003

GRANTS, AWARDS & HONORS

Biogeoscience Student Research Award, Boston University (\$500)	Apr 2016
Earth and Environment Department Research Grant, Boston University (\$250)	Apr 2016
Geological Society of America Graduate Research Grant (\$1250)	Apr 2015
Boston University Women’s Guild Scholarship Award (\$1000)	May 2015
Biogeoscience Student Travel Award, Boston University (\$500)	May 2015
*Buck Ketchum Prize – Best Graduate Oral Presentation (\$100) New England Estuarine Research Society – Bristol, RI	Apr 2015
Niering Travel Award (\$100) New England Estuarine Research Society	Jun 2011 & Apr 2015
Sigma Xi Elected Full Member Boston University Chapter of the Scientific Research Society	Mar 2014
STAR Award – Award in recognition for sustained excellence in service United States Department of the Interior, US Geological Survey, Menlo Park, CA	Sep 2007
**Rankin Prize – Best Undergraduate Oral Presentation New England Estuarine Research Society – Hull, MA	Apr 2006

ACADEMIC ACTIVITIES

Unisense Microsensor Workshop Louisiana State University – Baton Rouge, LA	Feb 2016
Summer Course, “Microbial Oceanography: Genomes to Biomes” Center for Microbial Oceanography Research and Education (C-MORE), School of Ocean and Earth Science and Technology (SOEST), University of Hawai’i at Mānoa	May–Jun 2013
Ecosystems Center of the Marine Biological Laboratory Semester in Environmental Science – Woods Hole, MA	Sep–Dec 2004

OUTREACH & VOLUNTEERING

- Interview with Woods Hole Sea Grant July 2019
Woods Hole Oceanographic Institute – Woods Hole, MA
<https://seagrants.who.edu/qa-with-sarah-foster/>
- Research Spotlight March 2019
Eos, Earth & Space Science News, American Geophysical Union
Citation: Thompson, E. 2019. When the river meets the sea: Estuary sediments and hypoxia. Eos, 100. <https://doi.org/10.1029/2019EO118217>
- Invited Workshop Session Co-Leader Aug 2018
New England Graduate Women in Science and Engineering Summer Retreat,
Massachusetts Institute of Technology – Cambridge, MA
- Invited Speaker, “What’s going on with the mud at the bottom of the bay?” Apr 2018
Waquoit Bay National Estuarine Research Reserve – East Falmouth, MA
- Graduate Student Representative Jan 2017–Sep 2018
Boston University Marine Program – Boston, MA
- Massachusetts Volunteer Coordinator Nov 2016–May 2019
Science-Informed Leadership (SciLead)
- Coastal Biogeochemistry Workshop Leader May & Apr 2017
TeenSHARP (grades 9–12) – Boston University, MA
- Microbial Ecology Workshop Leader, “Microbes and Mud” Jul 2011–2012, 2014–2016
Women in Science Summer Camp (grades 6–9)
Waquoit Bay National Estuarine Research Reserve (WBNERR), East Falmouth, MA
- Microbiology Seminar Workshop Leader, “Microbes, microbes everywhere” Aug 2017
Tidal Quest Summer Camp (grades 9–12) –
Waquoit Bay National Estuarine Research Reserve (WBNERR), East Falmouth, MA
- Workshop Leader, “Estuaries: Gradients from the land to sea” Jul 2013 & 2016
Summer Pathways at Boston University – Boston, MA
- Workshop Leader, “Greenhouse Gases and Respiration” Jul 2014
Upward Bound at Boston University – Boston, MA
- Foster, S.Q. 2013. Blog for Summer Course. May–Jun 2013
“Microbial Oceanography: Genomes to Biomes”. Center for Microbial Oceanography
Research and Education (C-MORE), School of Ocean and Earth Science and
Technology (SOEST),
University of Hawai’i at Mānoa. <http://www.fulweilerlab.com/sarah-fosters-cmore-blog.html>

Lab Research Video – BU Today http://www.bu.edu/buniverse/view/?v=DhKH11Ah	Aug–Nov 2012
Workshop Leader, “Breathless: Coastal N pollution” Upward Bound at Boston University – Boston, MA	Feb 2012
Science Fair Judge Brighton Public High School, Brighton, MA	Feb 2012
America Reads/Counts Program Tutor Marks Meadow Elementary School, Amherst, MA	2003–2006
Organic Chemistry Workshop Leader, “Slime and Superballs” Day in the Lab & Girls’ Day in the Lab – Hampshire College, Amherst, MA	2003–2005

MENTORSHIP

Mollie R. Yacano Senior Thesis Project – Boston University, Boston, MA	2016–2017
Undergraduate Research Opportunity Program – Boston University	2015–2016

ANALYTICAL & RESEARCH QUALIFICATIONS

Computer Software Programs and Mapping

- Proficient in R & R Studio, JMP, Microsoft Office
- Familiar with QGIS, ArcGIS, MATLAB, Stat Plus, Grapher (Golden Software), Seabird Data Processing

Scientific Instruments

- Proficient using a gas chromatograph, membrane inlet mass spectrometer, Sea-Bird CTD (submersible instrument package), fluorometers, Hydrolab HACH probes
- Familiar with microsensors, nutrient auto-analyzers, spectrophotometers

Analytic Procedures

- Proficient conducting the analyses for greenhouse gases (CO₂, CH₄ and N₂O by gas chromatography), N₂ and O₂ concentrations (using MIMS, N₂/Ar technique), sediment core metabolism & nutrient fluxes, dissolved oxygen (Winkler titration method), chlorophyll & pheophytin (by fluorescence), suspended particulate matter
- Familiar conducting analyses for dissolved nutrients (ammonium, phosphate, silicate, nitrate, nitrite by colorimetry), N₂ fixation (acetylene reduction method), nitrification & denitrification (potentials & in situ rates),

Certifications

- Open water SCUBA Diver (NAUI certified, Apr. 2006), Motorboat Operator (26 ft and under, Class I or A, certified Aug. 2007), CPR / AED and First Aid (Medic First Aid International certified Aug 2009)

PROFESSIONAL ACTIVITIES

Reviewer, <i>Env. Microbiology and Environmental Microbiology Reports</i>	Apr 2018
Reviewer for <i>Marine Pollution Bulletin</i>	Apr 2017
Reviewer for <i>Estuaries and Coasts</i>	Jun 2016
Reviewer for <i>Applied Geochemistry</i>	Feb 2014
Guest Lecturer – Environmental Science Course Boston University, Boston, MA	Apr 2013
Guest Lecturer – Introduction to Oceanography Course Boston University, Boston, MA	Nov 2010

PROFESSIONAL AFFILIATIONS & MEMBERSHIPS

American Geophysical Union (AGU)
Association for the Sciences of Limnology and Oceanography (ASLO)
Coastal and Estuarine Research Federation (CERF)
Ecological Society of America (ESA)
Earth Science Women's Network (ESWN)
New England Estuarine Research Society (NEERS)
Sigma Delta Epsilon Graduate Women in Science (SDE/GWIS)
Buzzards Bay Coalition, Massachusetts