

Helena McMonagle

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EDUCATION

University of Washington , Seattle, WA PhD Candidate in the School of Aquatic and Fishery Sciences (SAFS) with Dr. Tim Essington and Dr. Ray Hilborn. Studying ecosystem services of mesopelagic fishes including fish carbon transport and supporting services in marine food webs.	2019 - Present
Wellesley College , Wellesley, MA B.A. in Biological Sciences with Honors; GPA: 3.73/4.00. Relevant coursework: Marine Biology, Organic Chemistry, Lake Baikal (with 5-week field component in Siberia), Climate Change and Society.	2012 - 2016
Sea Education Association , Woods Hole, MA Marine Biodiversity and Conservation semester program. Coursework included Advanced Topics in Biological Oceanography, Ocean Science and Public Policy. Included six-week research cruise.	Spring 2015

RESEARCH EXPERIENCE

Woods Hole Oceanographic Institution , Woods Hole, MA Research Assistant, Llopiz Lab: studied and utilized nutritional condition proxies (otolith increment widths and RNA/DNA ratios) of Arctic cod. Collected mesopelagic fish and zooplankton at sea, dissected fish, analyzed data and participated in outreach events for the Ocean Twilight Zone Project.	2018 - 2019
Woods Hole Oceanographic Institution , Woods Hole, MA Research Assistant, Aluru Lab: examined effects of aquatic toxicants on gene expression and methylation patterns, using zebrafish and Atlantic cod as model organisms.	2017 - 2018
Scripps Institution of Oceanography , La Jolla, CA Undergraduate Research Fellow: Co-authored paper with Dr. Tony Koslow on relationships between climate variability and biodiversity of fish assemblages. Presented at 2016 Ocean Sciences Meeting.	Summer 2015
Marine Biological Laboratory , Woods Hole, MA Student Researcher: Completed senior honors thesis investigating microbial colonizers on plastic marine debris with Dr. Linda Amaral-Zettler using molecular and bioinformatics techniques. Senior thesis published in print and online in the Wellesley College Library and Digital Scholarship Repository.	2015 - 2016

RESEARCH INTERESTS

Broadly, I am interested in understanding human impacts on the marine environment as well as studying and communicating ecosystem services provided by the ocean to inform ocean policy and sustainable marine resource management. Specifically, my current research focuses on the ecosystem services associated with mesopelagic fish, such as their carbon transport during their diel vertical migration that brings carbon from the surface waters into the deep sea.

PUBLICATIONS

1. **McMonagle, H.**, Llopiz, J.K., Hilborn, R., Essington, T.E. (2023). High uncertainty in fish bioenergetics impedes precision of fish-mediated carbon transport estimates into the ocean's twilight zone. *Progress in Oceanography* 217, 103078. <https://doi.org/10.1016/j.pocean.2023.103078>
2. Bisson, K., **McMonagle, H.**, Iglesias, I., Halfter, S., Gallo, N. (2023). Five reasons to take the precautionary approach to deep sea exploitation. *Communications Earth & Environment* 4 (1), 152. <https://doi.org/10.1038/s43247-023-00823-4>
3. Quigley, L.A., Caiger, P.E., Govindarajan, A., **McMonagle, H.**, Jech, J.M., Lavery, A.C., Sosik, H.M., Llopiz, J.K. Otolith characterization and integrative species identification of adult mesopelagic fishes from the western North Atlantic Ocean. *Frontiers in Marine Science* 10, 1217779. <https://doi.org/10.3389/fmars.2023.1217779>
4. Koslow, J.A., **McMonagle, H.**, Watson, W. (2017). Influence of climate on the biodiversity and community structure of fishes in the southern California Current. *Marine Ecology Progress Series* 571: 193-206. <https://doi.org/10.3354/meps12095>
5. Aluru, N., Hallanger, I., Bjornsdatter, L., **McMonagle, H.**, Harju, M. Hepatic gene expression profiling in Atlantic Cod (*Gadus morhua*) liver after exposure to organophosphate flame retardants revealed altered cholesterol biosynthesis and lipid metabolism. *Environmental Toxicology and Chemistry* 40 (6), 1639-1648. <https://doi.org/10.1002/etc.5014>

Manuscript in preparation or under review:

6. Govindarajan, A.F., Llopiz, J.K., Caiger, P.E., Jech, J.M., Lavery, A.C., **McMonagle, H.**, Wiebe, P.H. and Zhang, Weifeng. Assessing mesopelagic fish diversity and diel vertical migration with environmental DNA. *Frontiers in Marine Science*, in review.
7. Bucklin, A., Batta-Lona, P.G., Questel, J.M., Wojcicki, M., Wiebe, P.H., Llopiz, J.K., Glancy, S., Caiger, P.E., **McMonagle, H.**, Francolini, R., Govindarajan, A., Jech, J.M. and Thorrold, S.R. Integrative Molecular Metabarcoding and Morphological Analysis of Diets of Mesopelagic Fishes in the NW Atlantic Slope Water. *Deep-Sea Research I*, in review.

GRANTS AND FELLOWSHIPS

NSF Graduate Research Fellowship Program: Awarded by the National Science Foundation. Provides three years of graduate student stipend and tuition support from 2021-2024.

SAFS Fellowship: Awarded by the School of Aquatic and Fishery Sciences at the University of Washington. Provides eight academic quarters of tuition and stipend support from 2019-2021.

Technical Staff Training Grant (\$5000): Awarded by Woods Hole Oceanographic Institution to further develop professional skills among technicians. Covered two statistics courses (Oregon State University).

Scripps Undergraduate Research Fellowship (\$6000): Awarded by the National Science Foundation's Research Experience for Undergraduates (REU) program. Provided accommodation and stipend support during summer of 2015.

Association for the Sciences of Limnology and Oceanography Multicultural Program: Provided travel funding and accommodation to present at the 2016 Ocean Sciences Meeting in New Orleans, LA.

Jerome A. Schiff Fellowship (\$2000): Provided travel funding from Wellesley, MA to Woods Hole, MA

to complete senior honors thesis work, and some funding to offset student work-study in 2015-2016.

Global Engagement Grant, Wellesley College: Supported a full-time, paid internship at the environmental non-profit the Vieques Conservation and Historical Trust for the summer of 2014.

TEACHING EXPERIENCE

University of Washington, Seattle, WA	2021
Teaching Assistant: Led lab sections and guest lectured in Dr. Tim Essington's Conservation and Management Course (online due to COVID-19). Graded student essays as part of this natural science and writing credit course.	
University of Washington, Seattle, WA	2021
Teaching Assistant: Led lab sections and assisted students in their course projects in Dr. Tim Essington's Ecological Modeling course (online due to COVID-19).	
Marine Biological Laboratory, Woods Hole, MA	2016
Teaching Assistant: Provided course support for 20 undergraduate students in the Semester in Environmental Science program. Independently led fieldwork and taught lab and field techniques.	
The Vieques Conservation and Historical Trust, Vieques, Puerto Rico	Summer 2014, Winter 2015
Environmental Educator and Field Research Assistant: Interned at non-profit founded to protect natural resources of Vieques through research and education. Taught youth science program and collected coastal plankton net and CTD data.	

PRESENTATIONS

Ocean Twilight Zone Symposium, Woods Hole, MA. "Identifying and tackling uncertainty in fish-mediated carbon flux". September 2023. Oral presentation and poster.
Effects of Climate Change on the World's Ocean, Bergen, Norway. "High uncertainty in fish-mediated carbon transport into the ocean's twilight zone. April 2023. In-person and recorded oral presentation (https://www.youtube.com/watch?v=ODXyQZLSYyk&t=5712s).
Invited guest lecture in Conservation and Management FSH323, Seattle, WA. "Mesopelagic fish and trade-offs in ecosystem services." In-person, ~90 student course taught by Dr. Abigail Golden.
SAFS Graduate Student Symposium, Seattle, WA. "Fish and the carbon cycle: do they matter?" November 2022. Awarded "Best Lightning Talk".
University of Washington Scholars Studio, Seattle, WA. "What could deep sea fish (and their sinking poop) do for the ocean's ability to absorb our greenhouse gas emissions?" February 2022. Live-streamed and recorded oral presentation (https://tinyurl.com/UWScholarsStudioMcMonagle).
Ocean Sciences Meeting, New Orleans, LA. "Relationships between climate and biodiversity of fish assemblages in the southern California Current region". February 2016. Oral presentation.
Wellesley College, Wellesley, MA. "Initial microbial colonizers of microplastics in the North Atlantic Ocean". April 2016. Public presentation during Wellesley College Ruhlman Conference.

Stonehill College, Easton, MA .“A Glimpse into the Ocean’s Twilight Zone”. November 2018. Presented about mesopelagic ecology to a Marine Ecology undergraduate course.

Scripps Institution of Oceanography, La Jolla, CA. “Relationships between climate and biodiversity of fish assemblages in the southern California Current”. August 2015. Poster presentation at symposium.

Sea Education Association, Woods Hole, MA. “Initial microbial colonizers of microplastics in the Sargasso Sea”. June 2015. Poster presentation at Sea Education Association’s student symposium.

Falmouth High School, Falmouth, MA. “The Ocean Twilight Zone: Why Should We Care?” December, 2018. Interactive presentation at an optional assembly for high school students. Presentation [recorded](https://www.youtube.com/watch?v=N8QoDICZpEI) (published by Falmouth High School at <https://www.youtube.com/watch?v=N8QoDICZpEI>).

RELEVANT WORKSHOPS AND MEETINGS

Bridging International Activity and Related Research Into the Twilight Zone (BIARRITZ), 2019, Southampton, UK. Empiricists and modelers came together to advance knowledge of the twilight zone by enhancing international collaboration across eight major mesopelagic zone research programs. I represented Woods Hole Oceanographic Institution along with three other colleagues.

ICES Annual Science Conference, virtual in 2021. Co-convened a session on “Biomass, biodiversity, and ecosystem services in the mesopelagic zone” with Dr. Tom Langbehn and Dr. Peter Wiebe. Produced documents for continued networking based on individuals’ research focus for use after the workshop.

OUTREACH

Aquatic Sciences Open House, Seattle, WA 2019 – 2023
Planning committee (volunteer recruitment and educational materials sub-committees) and day-of volunteer instructor. Planned science-outreach event for over 500 attendees including K-12 students who participated in interactive demonstrations and activities related to aquatic and ocean sciences.

National Ocean Sciences “Orca” Bowl, Seattle, WA February 2020
Official: officiated competition for high school students that promotes science literacy and extracurricular experience in ocean science.

SeaDoc Society, Seattle, WA 2020
Volunteer: assisted in planning and active workshop for teachers and informal educators to learn about best practices of teaching marine science related to the Salish Sea.

Skype a Scientist, Various locations 2018 - 2021
Interviewee: Volunteered at least one per year with teachers with classrooms seeking interaction with an expert in the fields of Oceanography, Ecology or Climate Science.

Falmouth STEM Boosters, Woods Hole, MA 2017 - 2019
Board of Directors: Facilitating educational opportunities and planning outreach events at local research institutions for students in the Falmouth Public Schools. Science fair judge and student mentor.

Sea Education Association, Woods Hole, MA Spring 2018
Lab hand: Mentored a group of 3 undergraduate students in molecular biology and research methods, collected *Sargassum*, assisted with molecular biology lab work.

Falmouth Public Schools, Falmouth, MA

2017 - 2019

Science fair judge and Project Mentor: Assessed high school science fair projects during annual Science Fair and mentored 2 students on their science fair projects.

The New England Aquarium, Boston, MA

2014 - 2019

LiveBlue Service Corps Member: Volunteered at educational events, environmental cleanups and aquaculture facilities and the aquarium and greater Boston community.

RELEVANT SKILLS

Proficient in MS Office, Github, and R programming. Introductory Python and MATLAB. 850+ hours field work at sea. CTD, plankton net and midwater trawl deployment and sample processing. SCUBA Nitrox Certified. Small boat handling skills. Working proficiency in Spanish.