Helena McMonagle

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EDUCATION

University of Washington, Seattle, WA 2019 - Present
PhD Candidate, School of Aquatic and Fishery Sciences. Advisors Tim Essington and Ray Hilborn. Dissertation: *Quantifying and sustaining ecosystem services of mesopelagic fishes.*

Wellesley College, Wellesley, MA 2012 - 2016
B.A. in Biological Sciences with Honors; GPA: 3.73/4.00. Coursework in Marine Biology, Physics, Chemistry, Climate Change and Society, Spanish, Russian and German.

Sea Education Association, Woods Hole, MA Spring 2015
Marine Biodiversity and Conservation semester program. Coursework in Biological Oceanography, Ocean Science and Public Policy. Included six-week research cruise.

RESEARCH EXPERIENCE

PhD Student, University of Washington, Seattle, WA 2019 - Present

- Conducted biogeochemistry and fish ecology research by collecting data at sea and in the lab, analyzed data using statistical and computer modeling tools, wrote peer-reviewed manuscripts
- Worked with three other scientists in three countries to synthesize literature and write comment piece on deep sea exploitation and policy considerations, published in *Nature Comment*
- Provided two interviews and fact-checking for "All the Fish We Cannot See" in Hakai Magazine, and co-wrote article for the University of Washington website about dissertation research

Guest Student, Woods Hole Oceanographic Institution (WHOI), Woods Hole, MA 2019 – Present

- Co-authored two manuscripts with WHOI collaborators for *Frontiers in Marine Science*

Research Assistant, Llopiz Lab, WHOI, Woods Hole, MA 2018 - 2019

- Measured otolith increment widths and RNA/DNA ratios of Arctic cod
- Collected mesopelagic fish and zooplankton at sea, dissected fish and analyzed data

Research Assistant, Aluru Lab, WHOI, Woods Hole, MA 2017 - 2018

- Examined effects of aquatic toxicants on gene expression and methylation patterns, resulting in data collection for multiple projects and publication in *Environmental Toxicology and Chemistry*

Undergraduate Research Fellow at Scripps Institution of Oceanography, La Jolla, CA 2015

- Analayzed CalCOFI time series data to assess relationships between climate variability and biodiversity of fish assemblages in the California Current
- Presented at 2016 Ocean Sciences Meeting and published in *Marine Ecology Progress Series*

Student Researcher, Marine Biological Laboratory, Woods Hole, MA 2015 - 2016

- Conducted fieldwork at sea, microbiology labwork, and bioinformatics analyses to investigate microbial colonizers on plastic marine debris with Dr. Linda Amaral-Zettler
- Senior thesis published in the Wellesley College Library and Digital Scholarship Repository

PUBLICATIONS

1. Govindarajan, A.F., Llopiz, J.K., Caiger, P.E., Jech, J.M., Lavery, A.C., **McMonagle, H.**, Wiebe, P.H. and Zhang, W. (2023). Assessing mesopelagic fish diversity and diel vertical migration with environmental DNA. *Frontiers in Marine Science*.

2. **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

3. 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

4. Quigley, L.A., Caiger, P.E., Govindarajan, A., **McMonagle, H.**, Jech, J.M., Lavery, A.C., Sosik, H.M., Llopiz, J.K. (2023). 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

5. 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

6. 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:

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 Northwest Atlantic. *In prep*.

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 for 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

- Led weekly lab section and guest lectured for 60-student Conservation and Management course as a teaching assistant. Graded student essays for this natural science and writing credit course.
- Led weekly lab section and assisted 30 students in course projects in Ecological Modeling course.

Marine Biological Laboratory, Woods Hole, MA 2016

- Provided course support for 20 undergraduate students in the Semester in Environmental Science program. Independently led weekly fieldwork and taught lab and field techniques.

The Vieques Conservation and Historical Trust, Vieques, Puerto Rico Summer 2014, Winter 2015

- Taught youth science program and collected coastal plankton net and water quality data as an Environmental Educator and Field Research Assistant

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 course, **University of Washington,** Seattle, WA. "Mesopelagic fish and trade-offs in ecosystem services." In-person, ~90 student course taught by Dr. Abigail Golden.

Invited guest lecture in Marine Biodiversity and Conservation course, Sea Education Association, Woods Hole, MA. "Ecosystem services and trade-offs". October, 2021.

Invited guest lecture in Marine Ecology course, Stonehill College, Easton, MA ."A Glimpse into the Ocean's Twilight Zone". November 2018.

SAFS Graduate Student Symposium, Seattle, WA. Presented in 2022 and 2023. Awarded Best Lightning Talk for "Fish and the carbon cycle: do they matter?" and People's Choice Award for "Writing Faster Code with Github's Copilot"

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).

Falmouth High School, Falmouth, MA. "The Ocean Twilight Zone: Why Should We Care?" December, 2018. Interactive presentation at an assembly for high school students. Presentation recorded and published by Falmouth High School: https://www.youtube.com/watch?v=N8QoDlCZpEI

PROFFESIONAL SERVICE

ICES Annual Science Conference, virtual in 2021. Co-convened 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.

Quantitative Ecology Seminar, virtual in 2021. Co-organized weekly seminar series focused on research and current issues in quantitative marine and freshwater ecology. Invited domestic and international speakers, introduced speakers, advertised seminar series at University of Washington, and ran technology.

Peer reviewer for *Limnology and Oceanography*, *Frontiers in Marine Science*, and *Food Policy*.

OUTREACH

Board of Directors member at Students Explore Aquatic Sciences, Seattle, WA 2019 - 2023

- Recruited new members and prepared volunteers for teaching in classrooms
- Planned and executed annual Aquatic Sciences Open House event for ~500 attendees including K-12 students who participated in interactive activities related to aquatic and ocean sciences
- Fact-checked three children's books (*Where the Weird Things Are, Diving Deep* and *A Window into the Ocean Twilight Zone*). Read two of these books to students at the Open House event
- Collaborated with SeaDoc Society to run workshop for STEM teachers and informal educators about best practices of teaching marine science related to local ecosystems in the Salish Sea

Official at National Ocean Sciences Orca Bowl, Seattle, WA 2020

- Officiated competition for high school students that promotes science literacy and extracurricular experience in ocean science.

Volunteer at Skype a Scientist, Various locations 2018 - 2021

- Volunteered at least one per year to teach a lesson in Oceanography, Ecology or Climate Science.

Board of Directions member at Falmouth STEM Boosters, Woods Hole, MA 2017 - 2019

- Facilitated educational opportunities and planning outreach events at local research institutions for students in the Falmouth Public Schools. Annual science fair judge and mentor for 2 students.

Lab Hand at Sea Education Association, Woods Hole, MA Spring 2018

- Mentored 3 undergraduates in molecular biology and research methods, collected samples at sea

LiveBlue Service Corps Member at The New England Aquarium, Boston, MA 2014 - 2019

- Volunteered at educational events, environmental cleanups, aquaculture facilities and the aquarium
- Wrote blog post for New England Aquarium website about beach clean-ups in Boston Harbor

RELEVANT SKILLS

Proficient in MS Office software, Github, and R programming. Introductory Python and MATLAB programming. 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.