

# Helena McMonagle

School of Aquatic and Fishery Sciences, University of Washington

Website: <https://hmcmonagle.github.io>

## EDUCATION

**University of Washington**, Seattle, WA 2019 – Present

*PhD Candidate, School of Aquatic and Fishery Sciences; GPA: 3.96/4.00.* Advisors Dr. Tim Essington and Dr. Ray Hilborn. Dissertation title: *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 Molecular Biology, Marine Biology, Physics, Calculus, Chemistry, Science Writing, 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. Six-weeks of data collection at sea for independent research project.

## RESEARCH EXPERIENCE

**NSF Graduate Research Fellow**, *University of Washington*, Seattle, WA 2019 – Present

- Conducted biogeochemistry and fish ecology research by collecting data at sea and in the lab and analyzing data using bioenergetic and statistical modeling to assess the role of mesopelagic fishes in ocean carbon cycling and marine food webs. Published results in *Progress in Oceanography*
- Co-led workshop for 15-20 undergraduate and graduate students applying for NSF research fellowships
- Awarded the Ecological Society of America Graduate Student Policy Award for 2024 workshop in D.C.

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

- Co-authored two manuscripts on mesopelagic zone ecology with WHOI collaborators on mesopelagic fish otoliths and mesopelagic fish diversity, both published in *Frontiers in Marine Science*

**Research Assistant**, *Llopiz Lab and Aluru Lab, WHOI*, Woods Hole, MA 2017 – 2019

- Measured otolith increment widths and RNA/DNA ratios of Arctic cod (Llopiz Lab)
- Mentored one undergraduate student on otolith dissection and imaging (Llopiz Lab)
- Collected fish and zooplankton at sea; conducted data analysis and data visualization (Llopiz Lab)
- Examined effects of aquatic toxicants on gene expression and epigenetics in fish and published results in *Environmental Toxicology and Chemistry* (Aluru Lab)

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

- Analyzed 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 results in *Marine Ecology Progress Series*

**Undergraduate Research Assistant**, *Marine Biological Laboratory*, Woods Hole, MA 2015 – 2016

- Conducted fieldwork at sea, microbiology lab work, 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*. <https://doi.org/10.3389/fmars.2023.1219993>
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. (2021). 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. **McMonagle, H.**, Llopiz, J.K., Maas, A.E., Steinberg, D.K., Govindarajan, A.F., Hilborn, R., Essington, T.E. The contribution of mesopelagic fishes to the biological carbon pump in the Northeast Atlantic Ocean. *In prep.*
8. 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.*

## **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.

**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. Recording available at: <http://tinyurl.com/ECCWO5>

**University of Washington, Seattle, WA.** Invited by Dr. Abigail Golden to give guest lecture, “Mesopelagic fish and trade-offs in ecosystem services,” February 2023.

**Sea Education Association, Woods Hole, MA.** Invited by Dr. Jeff Schell to give guest lecture, “Ecosystem services and trade-offs,” October, 2021.

**Stonehill College**, Easton, MA . Invited by Dr. Martha Hauff to give guest lecture, “A Glimpse into the Ocean’s Twilight Zone,” November 2018.

**Graduate Student Symposium**, Seattle, WA. Best Lightning Talk for “Fish and the carbon cycle: do they matter?” (2022) and People’s Choice Award for “Writing Faster Code with Github’s Copilot” (2023)

**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.

Recording available at: <https://tinyurl.com/UWScholarsStudioMcMonagle/>

**Falmouth High School**, Falmouth, MA. “The Ocean Twilight Zone: Why Should We Care?” December, 2018. High school assembly presentation. Recording by Falmouth High School: <http://tinyurl.com/FHSassembly>

## **LEADERSHIP EXPERIENCE**

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**Conference Co-Convener**, *ICES Annual Science Conference* 2021

- Co-convended session “Biomass, biodiversity, and ecosystem services in the mesopelagic zone”
- Collaborated with Dr. Tom Langbehn (Norway) and Dr. Peter Wiebe (USA) to review abstracts and accepted 26 oral and poster presentations from scientists from 10 countries, with 93 total participants
- Ran networking session, and presented research on the role of mesopelagic fishes in carbon cycling

**Board Member**, *Students Explore Aquatic Sciences*, Seattle, WA 2019 – 2023

- Planned annual outreach event, Aquatic Sciences Open House at University of Washington. Hosted ~500 attendees, including K-12 students and their parents, who participated in interactive activities related to aquatic and ocean sciences.
- Fact-checked three children’s books in science outreach (*Where the Weird Things Are*, *Diving Deep* and *A Window into the Ocean Twilight Zone*). Read two of these books at Open House event in Seattle, WA
- Provided two journalist 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
- Co-led two, hands-on marine food webs activities for K-8 students at STEAM Night in Shoreline, WA

**Graduate and Professional Student Senator (GPSS)**, *University of Washington*, Seattle, WA 2022

- Elected to represent graduate students in the School of Aquatic and Fishery Sciences in Senate voting

**Board Member**, *Falmouth STEM Boosters*, Woods Hole, MA 2017 – 2019

- Facilitated educational opportunities and planned outreach events at local research institutions for students in the Falmouth Public Schools. Volunteered as annual science fair judge and mentored one student on her science fair projects for two years

## **PROFESSIONAL SERVICE**

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**Joint Exploration of the Twilight Zone Ocean Network Member**, International 2019 – Present

- Collaborated with four early-career researchers to synthesize literature about deep seabed mining, deep sea fishing, and policy considerations, published in *Communications Earth and Environment*
- Reviewed literature and collaborated with ecosystem modeling team to collate literature estimates of carbon flux associated with zooplankton and fish for review (in preparation) on the role of the biological carbon pump in global carbon cycling

**Graduate Student Representative**, *Faculty Search Committee*, Seattle, WA 2022 – 2023

- Represented graduate students in the School of Aquatic and Fishery Sciences in faculty search process
- Contributed to designing interview and application rubrics to more equitably evaluate candidates
- Organized meetings with faculty candidates and graduate students, gathered graduate student input using polling, and presented graduate student feedback at faculty meeting

**Quantitative Ecology Seminar**, *University of Washington*, Seattle, WA 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, and advertised seminar series

**Peer reviewer** for 3 manuscripts in *Limnology and Oceanography*, *Frontiers in Marine Science*, & *Food Policy*

## **GRANTS & FELLOWSHIPS**

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**NSF Graduate Research Fellowship Program** (\$153,000): Awarded by the National Science Foundation. Provides three years of graduate student stipend and tuition support from 2021-2024.

**SAFS Fellowship** (\$102,000): Awarded by the School of Aquatic and Fishery Sciences at the University of Washington. Provides two years 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 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.

## **PUBLIC ENGAGEMENT & OUTREACH**

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**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 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 meeting science standards through marine science lessons 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 ocean science literacy.

**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 Directors 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 public blog post for New England Aquarium website about beach clean-ups in Boston Harbor

## **RELEVANT SKILLS**

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**Technical:** MS Office Software, Github, R Programming, Statistical Inference, Literature Review

**Communications:** Spanish Proficiency, Presentation and Public Speaking Skills, Teaching, Mentorship

**Field Skills:** 2000+ hours At-sea, CTD and Midwater Trawl Deployment, SCUBA Nitrox Certified