

Putting Science to Work

FOR MASSACHUSETTS' COASTAL COMMUNITIES

..... Program Guide 2020–2022



Research

Supporting leading-edge research in marine life, coastal processes and hazards, fisheries and aquaculture, climate change, stormwater management and tourism.



Education

Providing valuable leadership in marine and coastal science education and environmental literacy for students of all levels, educators, industry members and the public.



Extension

Partnering with the Cape Cod Cooperative Extension, our extension program serves as a link between coastal communities and the research and policy that affects them.

Mission

The Woods Hole Sea Grant program, based at the Woods Hole Oceanographic Institution (WHOI), supports research, education, and extension projects that encourage environmental stewardship, long-term economic development, and responsible use of the nation's coastal and ocean resources.

Research Awards 2020-2022



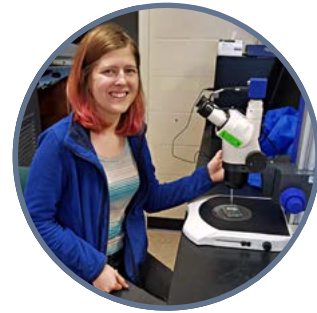
Closing the Loop: Characterizing habitat requirements, movements, and life stage linkages of river herring in Massachusetts watersheds

Adrian Jordaan of Univ. of Massachusetts-Amherst and Michelle Staudinger and Allison Roy of the U.S. Geological Survey will explore emigrating river herring in freshwater, riverine, and estuarine environments to provide new information on the density, mortality, and resource needs of juvenile life stages and explore the link between spawning adults and the success of their offspring.



Assessing the Seasonal and Storm-Impacted Transport and Biological Fate of Micro- and Nanoplastics Discharged from Wastewater Treatment Facilities into Massachusetts Coastal Waters

WHOI scientists Scott Gallagher and Jim Churchill will measure microplastics from four wastewater treatment plants and model the microplastic dispersion from wastewater outfalls to provide an assessment of where and when to expect elevated uptake of microplastics by commercially important shellfish.



Microplastics in Coastal Marine Animals: Defining the problem

Jordan Pitt, an MIT-WHOI Joint Program graduate student, and WHOI scientists Mark Hahn and Neel Aluru will use state-of-the-art equipment to determine if micro- and nanoplastics are found in the tissues of shellfish and finfish, as well as determine the fate of different sized particles after consumption.



Shoreline Resilience and Inlet Management

WHOI scientists Steve Elgar and Britt Raubenheimer will observe and develop models for the recovery of beaches and the corresponding closing of ponds after inlet breaching to help develop breaching strategies for coastal managers that optimize exchange between coastal ponds and the ocean for a range of ponds and barrier spits, as well as a range of wind, tidal, and wave conditions.



Human Dimension of Rebounding Population of Seals and White Sharks on Cape Cod, Massachusetts

Jennifer Jackman, a professor at Salem State University, will lead a project to generate quantitative knowledge about the views and experiences of residents, tourists, and commercial and recreational fishers with regard to seals and sharks. Collaborators are based at the Center for Coastal Studies, Univ. of Massachusetts-Boston, Cape Cod Commercial Fishermen's Alliance, Atlantic White Shark Conservancy and Center for Animals and Public Policy of the Cummings School of Veterinary Medicine at Tufts University.



Understanding the Rewilding of Cape Cod: Creating a curriculum for middle school learners

Atlantic White Shark Conservancy Education Director Marianne Long and Research Scientist Megan Winton will develop a middle school level curriculum focused on the white shark-grey seal relationship and the associated challenge it presents for Cape Cod beachgoers.



Development and Testing of a Near-real-time White Shark Forecast System for Cape Cod, Massachusetts

Megan Winton, a research scientist with the Atlantic White Shark Conservancy, and Greg Skomal, a biologist with Massachusetts Division of Marine Fisheries, will develop and evaluate near real-time 'shark forecast' maps to alert beachgoers when conditions indicate a high probability of white shark presence.



Learn more at seagrant.who.edu

National Initiative Awards

Woods Hole Sea Grant is participating in several large collaborative projects funded through the NSGO's National Aquaculture Initiative. Extension specialist Josh Reitsma is contributing to a project led by Bassem Allam of Stony Brook University that aims to sequence the genome of the hard clam. Using genetic tools, they will develop a breeding program to produce clam stocks resilient to environmental challenges faced by aquaculturists from Florida through Maine.

Extension Specialists Abigail Archer, Josh Reitsma, and Harriet Booth, Education Specialist Grace Simpkins, and

Communicator Stephanie Murphy are participating in a project led by Tessa Gretchis of Connecticut Sea Grant with partners across the states of Massachusetts, Rhode Island, and Connecticut. This project will develop public outreach and education tools that address critical issues facing expansion and public perception of the aquaculture industry in southern New England.

Josh Reitsma is participating in a project led by Anoushka Conception of Connecticut Sea Grant and with project partners from across the country, aimed at growing the budding seaweed aquaculture industry across the US. The aim is to

develop a database of non-proprietary resources related to seaweed aquaculture and serve as a one-stop-shop for seaweed aquaculture stakeholders.

Research Coordinator Jennie Rheuban is participating in the development of a Regional Lobster Extension Program, a regional collaboration between all of the Northeast Sea Grant programs. Coordinated by Maine Sea Grant, this regional extension program will work to meet emerging needs among American lobster stakeholders and link lobster research results with industry members.

A total research investment of \$1.47 million over two years from NOAA and other non-federal sources.

The Knauss Marine Policy Fellowship

In February 2020, Woods Hole Sea Grant-sponsored fellows Amanda Dwyer of Northeastern University and Sean McNally of U Mass-Boston began their year-long placements through the prestigious John A. Knauss Marine Policy Fellowship. Dwyer is working with NOAA National Ocean Service's Marine Debris Program and McNally is with the office of U.S. Senator Brian Schatz of Hawaii.



Core Program Activities

Extension

Woods Hole Sea Grant conducts an effective outreach and extension program in collaboration with the Cape Cod Cooperative Extension of Barnstable County. This program emphasizes the application of research in social and natural sciences to coastal resource issues. Highlights include:

Fisheries and Aquaculture Program

- Conducts applied research and demonstration projects on issues such as oyster restoration, municipal shellfish propagation, and the management of shellfish diseases
- Disseminates information generated by research sponsored through Sea Grant and other funding agencies
- Provides professional and technical expertise and education to public officials, educators, and user groups involved in aquaculture and shellfisheries
- Manages several marine environmental monitoring programs
- Oversees a long-term marine water-quality monitoring program
- Assists with a variety of marine resource restoration and shellfish projects and coordinates activities of the Massachusetts River Herring Network

Coastal Resilience Program

- Educating coastal resource managers and the general public about the forces that shape our coastal landforms
- Providing guidance for modifications to existing coastal structures that improve the sustainability and function of coastal resource areas, as well as the valuable ecosystem services they provide
- Providing technical assistance on coastal processes, shoreline change, erosion control alternatives, potential effects of various human activities on coastal landforms, coastal floodplains, coastal hazards and hazard mitigation analyses, and dune restoration techniques
- Providing assistance with floodplain management, helping communities apply for and maintain participation in the National Flood Insurance Program's Community Rating System (CRS)
- Helping communities determine new floodplain management activities to improve the flood safety and coastal resiliency
- Educating coastal managers and the public about flood risk and safety

Education and Outreach

Woods Hole Sea Grant is a leader in marine and coastal science education and outreach, collaborating with various federal, state, and nonprofit organizations. Activities are designed to reach people of all ages and abilities, ranging from school age children, undergraduates and graduate students, industry members and others, and prepare them to make informed decisions involving our nation's coastal resources, communities, and economies. Highlights of our Education Program include:

COAST Program, in partnership with NOAA Fisheries Northeast Fisheries Science Center

- K-12 classroom visits
- Hands-on lessons based on the research at WHSG and NEFSC
- On-line resources for non-local educators
- STEM events, science fairs, career fairs, and other formal and informal youth programs

Professional development workshops for educators

- Held twice a year
- Connects regional educators with scientists, the latest marine and/or coastal research, and new curriculum to use in their classrooms

Girls in Science Fellowship, in partnership with Earthwatch Institute

- One-week, residential program for ten diverse, under-served high school females
- Work alongside female scientists, explore STEM career paths, and immerse themselves in research focused on current coastal issues.

