



# Program Guide 2022-2023

Putting Science to Work for Massachusetts'  
Coastal Communities



Photo by Bill Charette

## Mission

Woods Hole Sea Grant's mission is to enhance the practical use and conservation of coastal and marine resources by developing and sharing science-based knowledge to create a sustainable economy and environment for the diverse communities of Massachusetts.

**RESEARCH**  
**EXTENSION**  
**EDUCATION**

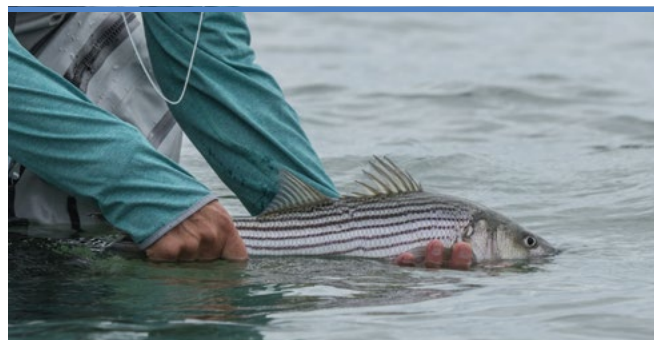


Photo by A. Burr

## Stripers on the Line: Quantifying short-term post-release activity, behavior, and mortality of striped bass in the Mass. Recreational fishery

Striped bass is a valuable recreational fishery, representing more than half of all recreational sport fishing in Mass. Nearly 95% of striped bass caught are released, yet little is known about their fate after release. Working with recreational anglers, Drs. Danylchuk and Griffin (UMass Amherst) will quantify the short-term activity patterns, behavior, and mortality of striped bass across a range of angling techniques, environments, and life stages.



Photo by Liz Cook, Boston Harbor Now

## Traditional Ecological Art & Science: Designing sustainable shorelines

Coastal communities in Mass. struggle to establish robust, sustainable, and equitable management solutions to increasing sea-level rise, flooding, and storms. Traditional ecological approaches have long allowed indigenous communities to maintain a sustainable relationship with their coastal environment. Drs. Chen (UMass Boston), Hetland (Mass. Coll. of Design), and Woods (Inst. for New England Native American Studies) will lead a team of students in designing sustainable shorelines that incorporate local traditional ecological knowledge, art, design and science.



## Modeling Unprecedented Low Dissolved Oxygen (Hypoxia) in Southern Cape Cod Bay

Bottom waters in southern Cape Cod Bay experienced severely low dissolved oxygen in the late summer of 2019 and 2020, the first time that these conditions have ever been documented in the region. This hypoxia led to fish and shellfish kills reported by local commercial fishers. WHOI scientists Drs. Scully and Geyer will investigate the causes of this phenomenon using a model to simulate the interactions between physical and biological processes that result in hypoxia.



Photo courtesy Woods Hole Sea Grant/ Cape Cod Cooperative Extension

## Barnacle Biofouling on Oyster Farms: Species-specific seasonal timing and population connectivity

Biofouling of farmed oysters and equipment can cause substantial reductions in productivity through reduced oyster growth, increased oyster death, physical damage, and increased equipment weight. WHOI scientists Drs. Pineda and Tepolt, and graduate student Weinstock will measure the species, timing and extent of barnacle biofouling on Cape Cod, assess population connectivity of species with short and long larval durations in Mass. and Maine, and investigate whether the timing and extent of biofouling is changing in response to ocean warming.

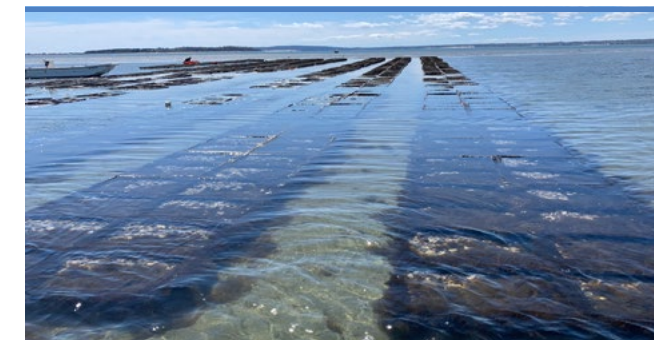


Photo by Kelsey Schultz

## Determining How Aquaculture Grow-out Methods Can Reduce the Negative Effects of Parasites and Micropollutants

Oyster aquaculture is an important industry in Mass. with landings in recent years exceeding \$30 million. However, environmental pollutants and oyster parasites can be critical challenges to oyster growers, and the potential interactions between these two stressors are not well known. Dr. Hanley (Northeastern Univ.) and collaborators will assess how different aquaculture methods affect the prevalence and intensity of oyster parasites and water micropollutant exposure to help growers minimize negative impacts.

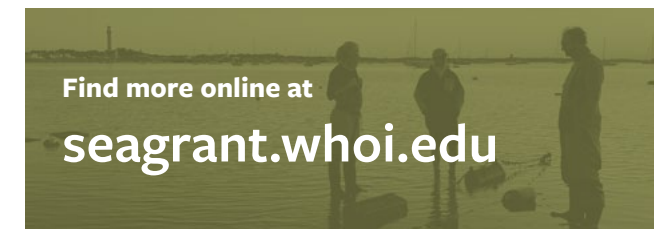


Photo by Matt Charette



## Massachusetts Sea Grant Graduate Research Fellowship

The new Mass. Sea Grant Graduate Research Fellowship, developed in partnership with MIT Sea Grant, provides funding and support for exceptional prospective graduate students who are engaged in coastal and marine research that furthers the goals of both programs. The Fellowships support cutting-edge research and the professional growth of the students through mentorship, professional development training, participation in conferences, and more.

## National Sea Grant Funded Initiatives

Woods Hole Sea Grant staff are participating in several large collaborative projects funded through the National Sea Grant Office:

- Linking lobster research results with industry members and meeting emerging needs among American lobster stakeholders, a Northeast Sea Grant collaboration coordinated by Maine Sea Grant;
- Contributing to a project led by Stony Brook University that aims to sequence the genome of the hard clam and develop a breeding program to produce clam stocks resilient to environmental challenges;
- Growing the seaweed aquaculture industry by developing a database of non-proprietary resources and serving as a one-stop-shop for seaweed aquaculture stakeholders, in a project led by Conn. Sea Grant;
- Addressing the continued impacts of the COVID-19 pandemic on seafood resources through partnerships with MA Division of Marine Fisheries Seafood Marketing Program and members of the Mashpee Wampanoag tribe;
- Addressing critical issues facing expansion and perception of the aquaculture industry in southern New England, in partnership with Conn. Sea Grant;
- Assisting with coordinated outreach, policy, technical, and/or legal expertise to Northeast coastal ocean energy stakeholders.

# Core Program Activities

## Extension

### *Applying research to coastal resource issues*

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**

- Cooperative research, monitoring, and education to assist the aquaculture industry with maintaining and enhancing production and adapting to changing conditions.
- Supporting the management of shellfisheries resources for continued sustainable production
- Provides professional and technical expertise and education to public officials, educators, and user groups involved in aquaculture and shellfisheries
- Supporting the management of and education about diadromous fish populations and historic fisheries
- Monitoring to help communities sustain and restore water quality

### **Coastal Resilience Program**

- Providing coastal resource managers and community members with technical information about coastal processes and hazards to promote resilience
- Supporting and educating communities with efforts to improve coastal resilience through floodplain management.

## Education and Outreach

### *Providing leadership in marine and coastal science education and environmental literacy*

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:

- **Girls in Science Fellowship**, held in partnership with Earthwatch Institute, is two week-long, residential program for ten diverse, under-served high school females who work alongside female scientists, explore STEAM career paths, and immerse themselves in research focused on current coastal issues.
- **COAST Program**, in partnership with NOAA Fisheries Northeast Fisheries Science Center, provides K-12 classroom visits and hands-on lessons based on the research at WHSG and NEFSC, as well as on-line resources for non-local educators and STEM events, science fairs, career fairs, and other formal and informal youth programs.
- **Professional development workshops for educators**, held twice a year in partnership with WHOI, connects regional educators with scientists, the latest marine and/or coastal research, and new curriculum to use in their classrooms.

All photos courtesy Woods Hole Sea Grant/Cape Cod Cooperative Extension



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