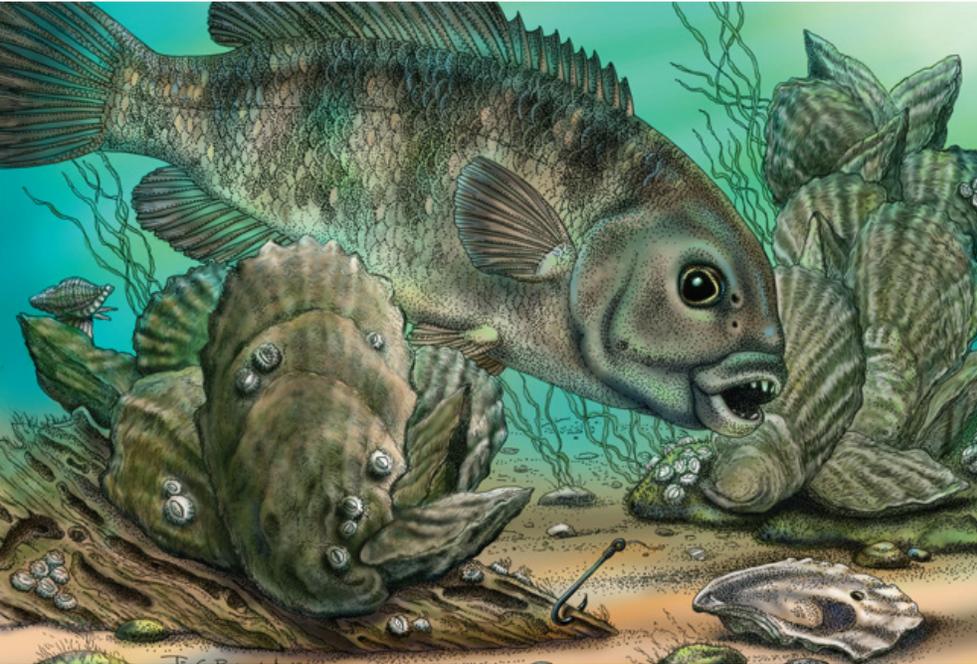


# \$2.1 Million Awarded for Sea Grant Research on NY's Coastal Environment, Communities and Resources

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Oyster reefs were once a dominant feature of estuaries along the Atlantic and Gulf of Mexico Coasts with healthy communities of eastern oyster. New research supported by NY Sea Grant will provide information to support oyster restoration efforts in NY/NJ harbor. *Image credit: Jan Porinchak*

New York Sea Grant (NYSG) has awarded over \$2.1 million to support six coastal science research projects that explore topics relating to and benefiting New York's coastal environment, communities and economies.

### Oyster Aquaculture (Stony Brook University)

Oyster aquaculture represents a sustainable industry that contributes to the economies of local coastal communities. **Dr. Bassem Allam**, of Stony Brook University's (SBU) School of Marine and Atmospheric Sciences (SoMAS), is leading a research team including **Drs. Emmanuelle Pales-Espinosa** and **Robert Cerrato**, also of SoMAS, and Cornell Cooperative Extension's **Gregg Rivara** in a study comparing the performance of different oyster lines derived from different genetic backgrounds. Further, the team will contrast the performance of locally-derived triploid oysters with that of their diploid counterparts. Superior oyster lines identified during the study will be maintained and broadly distributed to the aquaculture industry in the state and beyond. New York consumers will benefit from an increased availability of high quality and competitively priced oyster products.



In an effort to help prevent erosion, signage encourages beachgoers to keep off coastal bluffs. New research supported by NY Sea Grant will provide information that will allow for improved prediction of bluff erosion that informs planning by coastal communities. *Image credit: Cornell Extension Marine Program*



Long Island's Great South Bay became clearer during the 2019 season due to a new inlet but it is not immune to brown tides and other HABs. New NYSG research will develop and test shellfish aquaculture techniques that integrate macroalgae culture. Macroalgae have been shown to help control a variety of HABs populations. *Image credit: Chris Gobler*

### Erosion and Recession of Coastal Bluffs (Stony Brook University)

Coastal bluffs comprise a significant percentage of shorelines in the Great Lakes, U.S. Atlantic and Pacific Coasts. Erosion and recession of bluffs are an issue of concern to coastal communities and are being more frequently and extensively impacted by rising sea levels, extended droughts, heavier rainfall, and coastal storms. **Dr. Ali Farhadzadeh** of SBU's Civil Engineering and SoMAS and **Dr. Henry Bokuniewicz** of SoMAS will conduct a study to identify and quantify some of the underlying processes, both sea- and land-based that lead to coastal bluff erosion. With an enhanced understanding of the factors involved with bluff recession gained through this project, a modeling framework that improves prediction of bluff erosion is expected. The developed model could also be used to identify risk

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Record level flooding has been a challenge for coastal communities along Lake Ontario. New research supported by NY Sea Grant will provide information that will help communities apply for assistance through The New York Climate Smart Communities Program. *Image credit: Mary Austerman/NYSG*

areas where shoreline protection measures, including natural and nature-based features, could prevent or slow further recession. The results will be useful for resource managers and property owners to better predict and respond to future erosion under varying climate changes.

### **Mitigate Harmful Algal Blooms (Stony Brook University)**

During the past several decades, harmful algal blooms (HABs) have had significant environmental and economic consequences in New York's coastal waters. **Drs. Chris Gobler** and **Michael Doall** of SBU's SoMAS will conduct a study to assess the ability of cultivable macroalgae to inhibit the growth of HAB species common to NY waters while also expanding potential aquaculture opportunities. Previous studies have shown that macroalgae can inhibit the growth of HAB species through several mechanisms, including pH elevation, competition for nutrients, algicidal bacteria associated with macroalgae that produce allelochemicals that inhibit HABs species. The study will develop and assess cultivation techniques and test the feasibility of co-culturing HAB-combative seaweeds with bivalve shellfish at commercially viable scales on shellfish farms. The expected results of this project are the development of seaweed cultivation best practices and guidance materials that can be used by aquaculture operators and will create an opportunity to both expand the scope of the New York aquaculture industry and introduce a cost-effective method for mitigating HABs.

### **Oyster Restoration (Cornell University)**

The Hudson/Raritan Estuary (HRE) or NY/NJ Harbor Estuary was once home to large and robust populations of eastern oysters. A research team led by Cornell University's **Dr. Matthew Hare**—including partners from the Billion Oyster Project, University of Maryland Horn Point Laboratory, Norwich University, and the University of Maine's Darling Marine Center—aims to help improve the effectiveness of oyster restoration efforts, by developing an ecosystem model that couples hydrodynamics, water quality, and oyster biophysics to simulate how swimming larvae are transported to and from reefs. This will help in choosing the best sites for placing oysters. The ecosystem model will be available for planners to map locations with the highest chances of promoting future oyster recruitment, aiding efforts to grow self-sustaining oyster populations in the estuary.



RIT researchers, led by Dr. Professor Christy Tyler (center), received NYSG funding to study the potential impacts microplastics can have on Lake Ontario's sediments. *Image credit: Matthew HoffmanRIT*

### **Flood Resilience on Lake Ontario (Cornell University)**

The New York Climate Smart Communities (CSC) Program is a State program that helps local governments adapt to a changing climate. However, participation in the program among Lake Ontario municipalities is low, in part because of the requirement for municipalities to demonstrate the need for a project based on an assessment of future conditions derived from scientifically supported climate projections. To assist communities meet the requirements of the Program, Cornell University's **Dr. Scott Steinschneider** is leading a research team to develop and integrate modeling tools and social-science based recommendations to help Lake Ontario coastal communities better meet the CSC Program requirements and adapt to future coastal flooding.

### **Microplastic Pollution (Rochester Institute of Technology)**

Microplastics are a contaminant of growing concern as their widespread presence in many ecosystems is increasingly observed. However, little is known about their impacts on ecosystem function, especially in sediments of freshwater ecosystems. A research team at Rochester Institute of Technology led by **Dr. Christy Tyler** aims to help address this knowledge gap in Lake Ontario's New York waters. The study will combine sediment sample analysis with three-dimensional transport modeling to produce the first known estimates of polymer-specific plastic flux to the sediment in the Great Lakes. These estimates will then inform toxicity experiments at environmentally relevant concentrations to assess effects on key organisms to estimate the potential impact of microplastics on benthic ecosystem function. Results from the study should provide information and tools to inform future research and policy.

