

# New York Sea Grant Research Zooms In On Water Quality, Climate Change, Ocean Acidification

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Lab technician Ryan Anderson services a water quality sensor package on western Long Island. Image credit: Dr. Christopher Gobler

In 2016-17, New York Sea Grant (NYSG) supported more than \$1.4 million in university-based research related to a variety of marine, Hudson estuary, and Great Lakes topics and issues.

Results and resources from these investigations – conducted by top-notch physical oceanographers, food scientists, benthic ecologists, aquatic toxicologists, fisheries modelers, geochemists, and others – provide useful information to the public, businesses, and managers.

NYSG research also sets benchmarks within the scientific community, advancing the state of knowledge in many fields.

Examples include:

## Innovative Studies on Water Quality

### Pharmaceuticals in New York waters (R/CTP-54 McElroy)

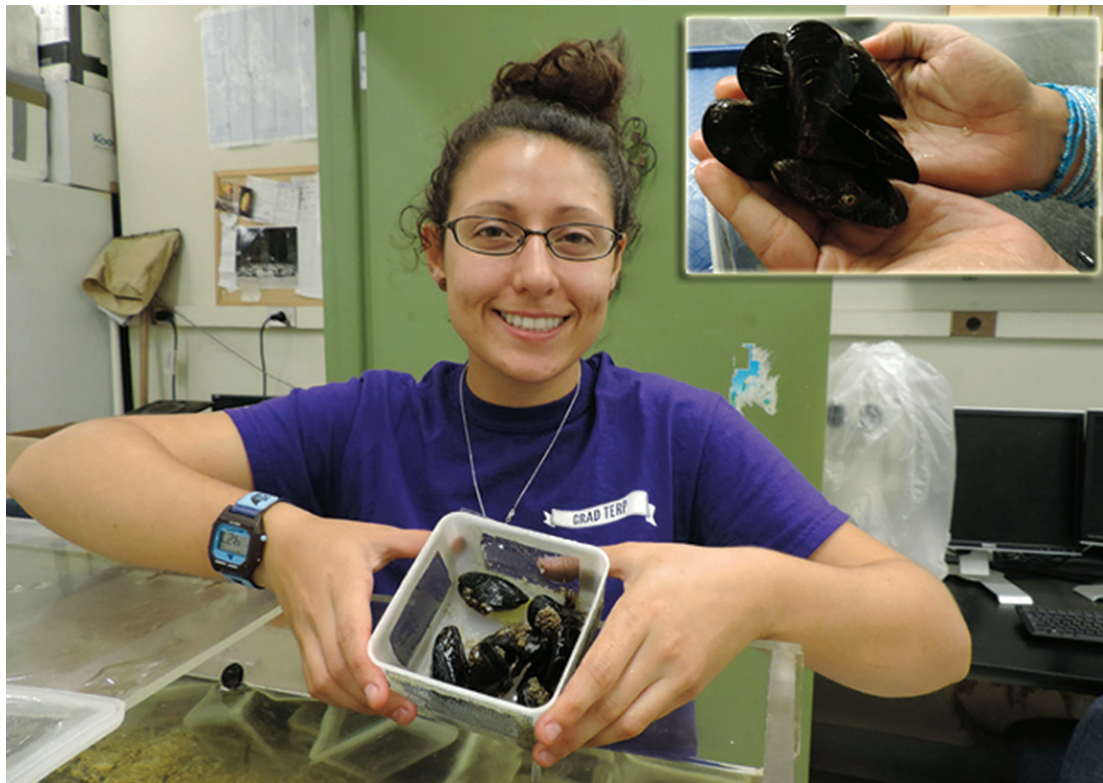
A Stony Brook University (SBU)-led team is exploring the effects of drugs and their break-down products on the behavior of fish. Investigators are also looking at how well advanced wastewater treatment technologies reduce discharges of these chemicals. Preliminary results show that some compounds are able to influence developmental and metabolic processes and may have implications for altering individual health and fitness in fish.



Nearly 500 lbs. of pharmaceuticals were collected during the April 2009 event that New York Sea Grant helped to organize and sponsor. Image credit: NYSG



"There is great public demand for swimming at Gallagher Beach. This study funded by New York Sea Grant is first step to solving water quality issue," said Congressman Brian Higgins at a August 2016 press conference to announce the project. Image credit: Office of Congressman Brian Higgins



Blue mussels were collected from different regions around Long Island Sound where they currently experience different environmental conditions. Allison Rugila (above) was a SBU graduate student and Sea Grant Fellow on this NYSG ocean acidification project. Image credit: Dr. Dianna Padilla



A scallop shell washed ashore in Noyac Bay. Image credit: Paul C. Focazio



A Stony Brook Southampton student prepares field samples for tissue analyses. Image credit: Dr. Steve Tettelbach

## Innovative Studies on Water Quality (cont'd)

### Impact of Pollution Sources on Bacteria Levels in Buffalo's Gallagher Pier Area (R/XG-27 Pettibone / McMillan)

Researchers at Buffalo State University have provided data that has proven useful for the management of nearshore water quality in the NY's Buffalo region. Investigators used new molecular methods to analyze the bacterial community structure in the Gallagher Pier Area at the Buffalo Harbor State Park. Study results indicate that one possible source of contamination—a nearby stormwater outfall—is likely not the most important contributing factor to the bacterial community in the near shore waters. This study demonstrates the potential of using DNA analyses as a tool in confirming or eliminating suspected pollution sources and could be used when developing remediation strategies for other impacted areas.

### Examining Impacts of Climate Change and Ocean Acidification

#### Impacts of climate change, ocean acidification on NY's economically-important shellfish (R/FBM-38 Gobler)

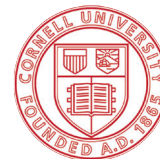
#### Flexing mussels: Does *Mytilus edulis* have the capacity to overcome effects of Ocean Acidification? (R/XG-25 Padilla)

#### Probing molecular determinants of bivalve resilience to ocean acidification (R/XG-24 Allam / Rivara)

Burning fossil fuels releases large amounts of carbon dioxide into our atmosphere, a part of which is absorbed by the ocean. This increase in carbon dioxide in the ocean is causing a change in ocean chemistry called ocean acidification. Learning how changes in ocean chemistry affect seafood is important to fisherman and all those whose enjoyment and culture is connected to the sea.

The potential impacts of ocean acidification on the biology and growth of economically-important bivalve species—bay scallop; hard clam, blue mussels and Eastern oysters—is being examined in a suite of related NYSG research projects.

Early preliminary results indicate that acidified conditions impact shell morphology of hard clams. Acidified conditions also have an impact of survivorship and stress response of juvenile blue mussels and that this may vary between populations. These projects continue to collect and analyze data that will improve our understanding of how New York's shellfish populations may be impacted by their ability to adapt by ocean acidification.



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