



A Newsletter from the New Jersey Sea Grant Consortium

# NJSGC Focuses on Coastal Resiliency

One foot of sea level rise can cause a relatively common coastal storm surge to mimic a 100-year, or one-percent storm, which would be similar to the surge of Superstorm Sandy.

That means a common Nor’Easter with one foot of sustained sea level rise would inundate all of Atlantic City with flood waters, according to Dr. Jon Miller, New Jersey Sea Grant Consortium’s coastal process specialist based at Stevens Institute of Technology.

“This is essentially the problem: we have this interface between climate change, sea level rise, and, of course, us — people,” Miller explained at the Sustainable Jersey City conference last fall at St. Peter’s University. “The reality is we live near the coast and we’ve done a lot of smart things and a lot of not so smart things in terms of where, how and when we developed. Now, we have some problems.”

Miller has projected that at the current rate of sea level rise with no discernible change in weather patterns, there will be 21



major flooding events along New Jersey’s coast and another 63 moderate flooding events, or about one every other year for the next 100 years assuming the same weather patterns of the previous century repeat themselves, he said.

The dense population of New Jersey means that one in eight people live near the coast, and the state’s urban economy centered in Jersey City and Newark is the third most vulnerable in the nation to sea level rise and climate change, Miller said.

More than two years have passed since Superstorm Sandy ravaged New Jersey’s coasts, and the scars of that storm still remain. Recovery efforts can be seen along the coast. Dunes and boardwalks are being rebuilt. Homes are being raised

*(Continued on next page)*



## News Briefs

### Needs Assessment of New Jersey Waterfront Business Owners published

A survey conducted by New Jersey Sea Grant Consortium in the aftermath of Superstorm



Sandy assessed the knowledge and concerns of waterfront entrepreneurs regarding climate change and sea level rise.

The surveyors sought to learn about how those businessmen and women learn about climate change and where they get information on the subject.

The report will help professionals who develop climate change outreach programs and products for those businesses.

Surveyors also collected data on the actions business owners took to minimize damage at their respective establishments.

The full report is available at: [njseagrant.org/wp-content/uploads/2014/02/Needs-Assessment-of-NJ-Waterfront-Business-Owners-1.pdf](http://njseagrant.org/wp-content/uploads/2014/02/Needs-Assessment-of-NJ-Waterfront-Business-Owners-1.pdf).



## State of the Shore set; Top Ten Beaches to be announced in July

NJSGC's State of the Shore, which examines how New Jersey's coastal environment weathered the winter months, is set for May 21.

The press event will once again be held on the Asbury Park boardwalk at McLoone's Asbury Grille.

In past years, the State of the Shore Report was delivered at the same time as the voting results for New Jersey Sea Grant Consortium's Top Ten Beaches.

This year, voting will be moved to May and June. The results will be announced

the week of Independence Day.



More details regarding both events will be posted at [njseagrants.org](http://njseagrants.org) in the coming weeks.

## Pre-proposals for 2016-18 Omnibus Research have been accepted

NJSGC has received 25 pre-proposals for the next round of funding beginning in 2016.

The Consortium's research program will make awards to scientists working in three focus areas (healthy coastal ecosystems, sustainable fisheries and aquaculture, resilient communities and economies) with an overarching theme of resilience.

A regional resilience competition was also open. This competition will be managed by Maryland Sea Grant and applications must have included an investigator from each of the following Mid-Atlantic States: Maryland, Delaware, Virginia and New Jersey.

Four regional research pre-proposals were submitted.

For more information visit:

<http://njseagrants.org/research/requests-for-proposals>.

## NJSGC Focuses on Coastal Resiliency

and razed.

With so much development along the Garden State's shorelines and tidal river banks, and so much rebuilding in the aftermath of Superstorm Sandy, focus has shifted to withstanding the next big storm and the effects of sea level rise and climate change.

Resiliency, or the ability for a community to withstand coastal storms, sea level rise and climate change, is a priority here in New Jersey and nationally.

Indeed, the need for resilient communities has become a top priority for the Obama Administration. In October, the president announced his Climate Action Plan, a first of its kind, comprehensive commitment across the federal government to support resiliency of our natural resources.

NOAA's Sea Grant Program is one of the key cogs of that plan.

Nationally, the Sea Grant Program through NOAA will provide \$15.9 million to support over 300 projects around the nation to help build resilient coastal communities and economies, the White House said in a prepared statement. Another \$7.9 million will supplement the federal funds through university, state and other partnerships.

Yet, adaptation measures in New Jersey are in their infancy.

"We know what's going on," said Dr. Peter Rowe, NJSGC's director of research and extension. "We have tools, and we are building new tools to know what to do and how to do it. But it will be implementation that is the major challenge.

But even before the president shifted national efforts to resiliency, New Jersey Sea Grant Consortium was working to build resilient communities.

"We were working in resiliency before resiliency was cool," Rowe said at the Getting to Resilience conference at the Bayshore Discovery Center in Bivalve this past November.

In 2010, the Consortium worked with the state's Department of Environmental Protection on a Coastal Communities Climate Change Initiative project in which researchers assessed vulnerability to flooding in Cape May Point, Little Silver and Oceanport.

The Consortium's current research is largely focused on studies related to resiliency. It includes projects such as "Facilitating Natural Dune Building," "Collaborative Climate Adaptation Planning for Urban Coastal Flooding," and "Development of Climate Change Adaptation Elements for Municipal Land Use."

Resiliency and adaptation are at the forefront of NJSGC's research priorities going forward. And there's also no shortage of ideas. By the deadline this past February, twenty-five pre-proposals were submitted and full proposals



## Shorelines and dunes lesson plans added

The Consortium's Education Department has posted three lesson plans related to the Garden State's coastal environment including understanding the importance of dunes and beaches and the impact of climate change. Teachers can explore the impacts of climate change and sea level rise with "Shrinking Shorelines." Then, they can learn what dunes are and how they work in "Dunes and Dune Grass." In "Why are Dunes Important?" teachers and students can dig deeper into beaches and dunes and discover how these natural structures help New Jersey coastal communities withstand storms and sea level rise.

All three lessons provide concise background information along with easy to follow directions on how to conduct hands-on inquiry-based activities in classrooms. Each lesson supports NJCCC standards. Education staff are currently working on correlating all lesson plans to the new Common Core and Next Generation Science standards.

## College course schedule now available

The 2015 NJSGC summer course class schedule for Introduction to Marine Science and Marine Biology — both four-credit, 200-level laboratory courses — is set. A 400/500-level independent study and SCUBA are also available.



There are two sessions for Introduction to Marine Science, and they will be taught at Brookdale Community College's Northern Monmouth County Higher Education Center in Hazlet.

There is one session for Marine Biology. It will be taught at Brookdale's main campus in Lincroft.

Courses are recognized for direct credit by most of New Jersey's colleges and universities. More information about NJSGC's summer college program can be found at: <http://njsgrant.org/education/college-programs/>



are due in June.

Regionally, the Consortium and its mid-Atlantic partners are seeking research proposals that focus exclusively on resilience. One grant will be awarded for that project and four pre-proposals have been submitted each with a primary researcher from New Jersey, Maryland, Delaware and Virginia.

This spring, NJSGC staff and researchers will be holding workshops for government officials from coastal communities on how to build the best dunes. The "Dune It Right" project will culminate with the publication of a digital manual that will address all aspects of dune building including incorporating many plant varieties apart from American dune grass into plans.

But the real challenge of resilience will be preserving the individual character of New Jersey's many communities. That's a challenge that the Consortium's recently hired community resilience and climate change adaptation specialist, Michael Schwebel, who is based at Monmouth University's Urban Coast Institute, acknowledged his first day on the job.

In Jersey City, that work has begun. Suggestions for raising streets, building street levies, and floodgates have all been proposed. But what works for Jersey City will not be the solution for every community.

However, NJSGC's partners like the Rutgers University Water Resources Program will help communities manage storm water. And Miller, at Stevens, is developing guidelines for living shorelines projects.

"We take these challenges; we understand these challenges," Miller said. "I think we have the ability to overcome them."



# Resiliency Expert Joins NJS GC Extension Staff

Michael Schwebel has joined New Jersey Sea Grant Consortium and Monmouth University's Urban Coast Institute as a community resilience and climate change adaptation specialist.

"I look forward to sharing innovative approaches and unique knowledge and expertise to help communities plan and become better prepared," he said.

Dr. Schwebel, 32, successfully defended his dissertation in March. He has done his doctoral research while studying at Temple University. He earned a master's degree in Environmental Science with a concentration on environmental policy from George Washington University and a bachelor's in landscape architecture from Penn State University.

Schwebel anticipates that working with such a diverse patchwork of communities will be a rewarding challenge. He

wants to help communities retain their individual character while preparing for the next big storm and the challenges of sea level rise.

"Being from New Jersey, I want to help communities plan sustainably for the future while keeping historical living patterns and shore culture intact," he said.

Schwebel, an East Brunswick native, is an avid runner and backpacker. He's run the Washington, D.C. Marathon, and has backpacked through the Galapagos Islands, American Samoa and the Northern Mariana Islands, where his Ph.D. research was concentrated.



DR. MICHAEL SCHWEBEL

# Remotely Operated Vehicle Workshops Conducted in Jersey City for Students and Teachers

The Hudson County Schools of Technology Foundation in Jersey City and New Jersey Sea Grant Consortium were awarded a \$14,552 grant from PSEG to continue their partnership that is bringing STEM programs based on underwater exploration to middle school students. This is the second year that PSEG supported NJS GC's program which focuses on the use of remotely operated vehicles, or ROVs, in deep-sea exploration. New funding will permit NJS GC to train Jersey City teachers on the ROV program and to develop a curriculum manual so teachers statewide can implement the STEM-rich ROV program into their own classrooms and out-of-school time programs.

The program is designed to increase the Consortium's science, technology, engineering and math, or STEM, offerings while continuing to focus on ocean sciences, said Diana Burich, the Consortium K-12 program coordinator.

Late last year, the Foundation and the Consortium were awarded \$24,000 in grants from PSEG and the PADI Foundation to bring underwater robotics programs to after-school and out-of-school settings.

"We proposed to develop and implement a four-day summer camp program for students from High Technology Middle School's Explore 2000 in Jersey City, and to provide a professional development workshop for their teachers to perpetuate the underwater robotics program in Jersey City in the future," Burich said. The camp and training workshop were held in July. "All of the activities for camp were student-centered and hands-on, and encouraged the children's natural sense of inquiry."

Curriculum and activities were developed for Aquatic Adventures – Science Enrichment Workshop to engage students in inquiry-based activities in coastal ecology and estuarine research and technology with a focus on underwater exploration using remotely operated vehicles.

"Development of this project was not only exciting but a learning experience as well, and we hope to continue utilizing the materials compiled in program offerings for NJS GC," Burich said.



Jersey City students built ROVs at last year's workshop.



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