A year and a half after Superstorm Sandy, recovery continues to challenge New Jersey. Montclair State’s Gerard Costa and his team from the Center for Autism and Early Childhood Mental Health received a $720,000, two-year grant from the New Jersey Department of Children and Families to provide training for those who help the state’s youngest residents cope with the disaster.

In New Jersey alone, where 34 people died in the storm, the financial toll from Sandy was estimated at $37 billion but, while great, the emotional cost is harder to measure. Despite the state’s strong disaster response network, most responders have little background in addressing the needs of very young children in the wake of natural disasters, according to Costa.

Costa’s team mobilized immediately to “help the helpers” with an initial informational email outreach, followed by a meeting to educate those in the state who work with families to address the needs of infants, toddlers and children directly affected by the storm.

They brought together those stakeholders to “inform them about the developmental, emotional, neurological and social consequences of traumatic events and provided them with guidelines and strategies to help,” Costa says.

After surviving a natural disaster, infants and young children may experience difficulties sleeping or eating, regress developmentally and be alternatively clingy or rejecting of touch, demanding or disinterested. During times of extreme stress, parents have difficulty reading young children’s...
Are School Improvement Grants making the grade?

University researchers are evaluating the New Jersey School Improvement Grant (SIG) Program. New Jersey is among nine states sharing more than $71 million in federal School Improvement Grants that aim to give underachieving schools the resources they need to succeed.

To ensure positive outcomes for students, the New Jersey Department of Education’s SIG program has contracted with Eden Kyse, director of the Center for Research and Evaluation on Education and Human Services (CREEHS), and Senior Research Associate Rebecca Swann-Jackson to lead a team to assess the statewide schools improvement program.

Helping minority STEM students succeed continued from page 1

“CREEHS is analyzing the grant program’s impact on district, school and student outcomes such as achievement on state assessments and dropout and graduation rates, as well as examining the relationship between SIG implementation and outcomes,” explains Swann-Jackson.

Since November 2013, the team, which also includes Research Associate Jessica Marin ‘06, graduate students Alyssa Sceppeguericco, Kelsey Wilson and Alyssa Byrne and staff member Joyvin Benton, has visited 11 grant-recipient schools, where they conducted in-depth interviews with NJDOE, district and school administrators and led focus group discussions with teachers, school staff and parents.

Separately, Kyse and her team also have been evaluating New Jersey’s Charter School Grant program that aims to increase the number of high-quality charter schools in the state.

“LSAMP creates, through social and academic networking, a collegial inter- and intra-alliance environment for STEM scholars, professors and graduate students,” says biology and molecular biology professor Carlos Molina, the University’s LSAMP program director.

Montclair State welcomed its first cohort of LSAMP students in fall 2009. This year, according to Molina, 104 undergraduates are taking part in the program’s educational and social events, tutoring and mentoring programs, internships, academic training sessions and research opportunities. Selected scholars receive up to $2,000 a year to support their LSAMP activities, while others access program support as LSAMP affiliates.

“The broader impact of the program is its ability to form a network of academic and social support for young scholars interested in pursuing STEM degrees and careers in STEM fields,” says Molina.

Robert Prezant, dean of the College of Science and Mathematics, says the University hopes to continue to lead this successful program with NSF funding well into the future.

“Having directed an LSAMP at Queens College and having helped create the one here, I can state with great confidence that this program is one that works,” says Prezant. “The design of the program successfully helps to self-motivate students who already have great capacity.”

Reducing flood risk

For New Jersey communities along the Hackensack and Hudson rivers, Superstorm Sandy was a dramatic wake-up call. Now a team of Montclair State and Rutgers University researchers has received funding from the New Jersey Department of Environmental Protection (NJDEP) to identify and evaluate ways to reduce future flood risk in these vulnerable communities.

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Biography and molecular biology professor Meiyin Wu’s team is focusing on the Hackensack River communities of Carlstadt, Moonachie and Little Ferry — cities built on marshland, much of which is only three to five feet above sea level. As it was developed, the area was diked with five-foot-high berms along the Hackensack River.

“When a storm surge exceeds five feet, water spills over the berms, flooding the area,” explains Wu. “This is only three to five feet above sea level. As it was developed, the area was diked with five-foot-high berms along the Hackensack River.”

“Reducing flood risk” continued from page 1

While the team is still developing specific recommendations for limiting future flooding, they’ve already identified steps that can mitigate damage. “Hospitals and fire stations should have flood prevention plans in place,” says Wu. “Bерms, storm water drainage systems and pumping stations should be regularly maintained.”

“Reducing flood risk” continued on page 4

Imaging the ocean

Earth and environmental studies professor Tanya Blacic will travel to South Korea this summer to initiate a National Science Foundation-funded collaboration with a researcher from Seoul National University. Blacic and geoscience graduate student Hayley Rosado will spend a month in professor Changsoo Shin’s lab working to apply his method of obtaining background sound speed models in the solid earth from marine seismic data to the ocean itself.

“The background sound speed models are a starting point for extracting high-resolution 2-D images of ocean temperature from marine seismic data,” explains Blacic. “These types of images can reveal fine-scale ocean processes like mixing and turbulence, which affect how heat and gases are distributed over time and space throughout the oceans and how they affect the climate system.”

“Imaging the ocean” continued on page 4
Good enough to eat?

What’s the most nutritious way to cook vegetables? That’s the question health and nutrition sciences professors Yanyan Li and John Specchio are looking to answer.

They’ve received a one-year grant from Panasonic to explore how various cooking methods impact nutrient retention in vegetables. “We’re now using fresh broccoli,” says Li. “We’ll expand to use kale, tomatoes and cabbage later.”

The team, which includes one undergraduate and two graduate students, is comparing microwaving to boiling and steaming. “We’re

After the storm continued from page 1

cues, which compromises the child’s feelings of safety, diminishes trust in parents to protect and increases the risk of social or behavioral difficulties.

The Department of Children and Families grant, which provides funding through 2015, will support continued training in all 10 counties most affected by the storm, including workshops to provide staff with the understanding of how disaster impacts infants and children, along with strategies to help (including ways to respond to trauma and to help families engage in reflective practices and self-care).

The Center for Autism and Early Childhood Mental Health also will provide parent workshops and workshops for community and faith-based organizations that wish to learn about the special needs of infants and children during this critical time.

“We hope to raise the bar and the ‘floor’ of knowledge regarding the power of the earliest relationships and experiences in forming the infant brain and mind,” Costa says.

“As a result, we expect that staff from a variety of backgrounds and roles — from infant and child care workers to child protective service caseworkers to home visitors and early intervention staff — will better understand that the ‘behavior’ they see is related to prior relationships and brain systems that were ‘co-constructed’ by the earliest experiences. This, in turn, will lead to changes in care and educational practices and better outcomes in infants and children.”

Shedding new light on Northern slavery

Slavery was not confined to the South, and new information about slavery in New York comes from archaeology research conducted on Long Island by Montclair State anthropologist and archaeologist Chris Matthews.

The 1790 Federal Census reported that the Martin family of Long Island owned 17 slaves. Josiah Martin built Rock Hall, a Georgian manor house, in 1767 on his 600-acre estate, staffing it with slaves from his Antiguan sugar plantation.

Matthews has unearthed new evidence at the Rock Hall manor house museum in Lawrence, New York suggesting that the relationships between the Martin family and their slaves were surprisingly complex.

“I’m interested in the stories of people without power. My interest in Rock Hall was the African-American story,” says Matthews, who has been involved with the museum’s archaeology projects since 2005. The artifacts suggest that the African Americans actively shaped the construction and culture of the manor house.

Finding Rock Hall’s kitchen was key. Excavations in the museum’s west yard unearthed a fireplace base made of tabby — a concrete made by crushing and burning seashells.

“Seismic waves are sensitive to small changes in water temperature and salinity, so we can see where temperature changes rapidly,” Blacic says. “This can help us understand nutrient distribution, which has implications for fisheries management.”

The implications are clear: “Slaves built this fireplace,” Matthews explains. “They claimed the space and made it their own. It’s important to understand that you don’t need to revolt to resist. By claiming the kitchen, the Martin slaves practiced a form of resistance.”

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The New York Times May 2014

Slaves resisted by practicing their religion. Matthews’ team found straight pins and other small items believed to be placed in doorways to protect slaves from harm.

For Matthews, the cached artifacts are the site’s most significant discoveries. “I almost couldn’t believe it,” he recalls. “It was amazingly fortuitous to even recover these tiny things. It would be easy to misinterpret these findings as remains of a dropped sewing basket, for instance. We were definitely in the right time and place to be able to interpret these artifacts by considering who worked and lived here.”

Mark P. Leone, an archaeologist and University of Maryland anthropology professor, told The New York Times that Matthews’ findings are “a significant discovery” in a relatively new field and that such sites are rare.

While Matthews ran a Montclair State field school in Setauket, New York this past summer and will return there in 2015, he is focusing his current archaeological efforts closer to campus on promising New Jersey slavery sites, such as the Vought House in Clinton. “Students will definitely be involved in these projects,” he says.

Matthews aims to paint a fuller picture of slavery. “I hope my work prompts a change in consciousness at historic sites. Many people benefited from slavery — many more suffered. We need to understand how complex the relationships were between slave owners and their slaves.”
The Student Research Symposium

The Eighth Annual Student Research Symposium showcased the academic research of more than 400 students from each of the University’s six colleges and schools. Students presented their research to their peers and the academic community. Here are a few of the award-winning projects:

**Fighting fat with math**

Undergraduate student Sharmin Uddin, collaborating with a clinical psychologist from the University of Alabama at Birmingham, studied data from patients working to lose weight and discovered that patients whose diets varied from 1,200 calories to 1,700 calories every two weeks, were better able to stick with their diets.

Using a weight loss calculator developed in part by Uddin’s advisor Diana Thomas, a mathematics professor and director of the Center for Quantitative Obesity Research at Montclair State, Uddin measured how well the dieters followed their prescribed regimens. Dieters who varied their caloric intake biweekly had an easier time following their diets.

“I found that patients were more compliant as the months moved on,” says Uddin, who won an award for best undergraduate oral/multimedia presentation. “Because it was easier to stick with the varied caloric intake, they said they could continue the diets beyond the end of the 16-week study period.”

**Future Scientist awards**

The first place TechLaunch Future Scientist Award at the Student Research Symposium went to Rabih Balilli from the Department of Chemistry and Biochemistry for his topic, “A computational evaluation of the steric and electronic contributions to the stability of the structures of α- and β-D-Glucopyranose part 4: Energy versus Geometry for α- and β-D-Glucopyranose in aqueous solution.” Balilli studied how the structure of glucose chemically interacts and changes with its environment.

Shivani Patel from the Department of Biology and Molecular Biology placed second. Her topic was “The inhibitory effects of EGCG and EGCG-stearate on Herpes Simplex Virus 1 (HSV-1) in cultured human epithelial AS49 cells.” In her work with professors Lee H. Lee and Sandra Adams, she studied how tea extracts can be used to treat herpes viruses.

**Helping save wildlife**

Montclair State students and faculty, in collaboration with the New Jersey Department of Environmental Protection’s Division of Fish and Wildlife, have identified wildlife road-crossing hotspots in New Jersey to ensure the continued existence of wildlife.

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Over a four-month period at 43 road transects, students and local volunteers observed a total of 1,001 animals, including 40 species of mammals and 866 amphibians — found either dead or alive — in these areas.

According to Kelly Triece, who won the award for best graduate oral/multimedia presentation at the symposium, the research results may be used to predict other possible mortality hotspots and, when applicable, inform road infrastructure mitigation managers to reduce future traffic and wildlife conflicts.

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The project also aims to promote environmental awareness of human impact on wildlife and the importance of restoring wildlife habitat connectivity by participating in community events such as local fairs and festivals as well as outreach in K-12 classrooms.

**PSENG grant to foster sustainable communities**

PSEG awarded a $1 million grant to the University’s PSEG Institute for Sustainability Studies to support research and partnerships in fostering a sustainable New Jersey model.

The institute supports efforts to better understand how New Jersey can work toward initiatives in sustainability that can help create a resilient model that balances a clean environment with economic growth and social justice.

“This award will help move the PSEG ISS into a key position to better advocate on behalf of sustainability practices,” says College of Science and Mathematics Dean Robert Prezant.

The three-year project also supports community environmental outreach programs and expands current Institute-funded research projects.

“With this award, the Institute will be able to become an even greater agent for positive environmental change in New Jersey and beyond.”

Says Prezant, “Climate change is real and will impact all we do in the years ahead. One goal of the PSEG ISS is to work with our government, industry, community and academic partners to help promote and create resilient communities that are able to develop plans that allow for environmental health and sound economy.”

Established in 2009, the PSEG Institute for Sustainability Studies has been dedicated to achieving a better understanding of how New Jersey can work to balance a clean environment with economic growth and social justice.

Collaborative partnerships with Montclair State University’s Passaic River Institute, its Center for Environmental Management and Analysis and its doctoral program in Environmental Management support the Institute’s mission as a center for innovation in sustainability and environmental management.

“We are happy to continue to support the PSEG Institute for Sustainability Studies as they continue to provide resources for students and academics who are increasingly broadening their knowledge of the relationship between the environment, businesses and economy, and social equality,” says Ellen Lambert, President of the PSEG Foundation.
Protecting the environment by degrees

For the 42 students enrolled in Montclair State’s doctoral degree program in environmental management, it’s easy being green.

Since 2009, the transdisciplinary program has prepared environmental scholars, scientists and research professionals for leadership positions in a flourishing field. “Our doctoral students are scientists who understand policy and policy people who understand science,” says director Dibyendu “Dibs” Sarkar.

“Our program is unique,” says Sarkar. “It’s the University’s first real interdisciplinary PhD program, the tri-state area’s first and only PhD program in environmental management and one of a very few such programs in the country.”

Sarkar was hired in 2008 to help build a PhD program from the previous, and less universally recognized, Doctor of Environmental Management (DEM) degree program. The DEM was phased out, with its students moving to the new PhD program in 2009.

Admission is highly competitive, with only eight of 47 applicants accepted in 2013. Of the program’s 42 students, 30 are enrolled full time. According to Sarkar, fewer than 15 percent of the students have master’s degrees from Montclair State. Roughly 40 percent of the doctoral candidates are international students.

Michael Pawlish, who receives his PhD in May, entered the program with an environmental science degree from Sweden’s Lund University and an MBA from San Francisco State University. “I was looking for a PhD program that combined these two traditionally opposing schools of thought,” he says.

Interdisciplinary coursework, taught by the University’s research-active faculty, spans natural and social sciences, engineering, environmental law and policy as well as economics and management.

According to College of Science and Mathematics Dean Robert Prezant, the program is distinguished by its focus on finding viable solutions to the critical issues that threaten our planet. “Serious questions, critical data collection and real-world analyses all matter in the pursuit of our students’ dissertation research,” he explains.

Students work with individual faculty mentors on research projects that focus on any of five research clusters: environmental quality and remediation; environmental and urban ecology; earth systems and climate change; environmental modeling and visualization; and environmental policy, socioeconomic and management impacts.