

NYSG's Knauss Fellow Spreads Ocean Optimism Internationally

In an era of rising seas and climate challenges, **Erin Eastwood's** catch phrase remains: ocean optimism. And growing up in southern California, it's no wonder that she's ready to dive into her new position as International Partnership Fellow with NOAA Research's Climate Program Office, where she was placed February 1 as New York Sea Grant's 2016 Knauss Fellow.

Erin's unique spot at NOAA offers her a cross-line office experience, as well as the ability to sit on interagency working groups alongside international agencies such as USAID with her boss and mentor, Meredith Muth, who was Virginia Sea Grant's 2010 Knauss Fellow. One of their goals is to help the Climate Program Office develop an international strategy to help coasts prepare for climate change.

Erin is well-suited for international work. After participating in field work on carbon sequestration in the Peruvian Amazon rainforest canopy, her Master's thesis (awarded from Columbia University) on population dynamics of coral reef species in Fiji brought her back to the Pacific, where her undergraduate work included ecology of Australia's rainforests and reefs.

"Fiji has its unique climate challenges," says Erin. "We looked at fishery-targeted species from a genetic standpoint, and determined how populations from different marine protected areas in the country are

connected to each other. This 'connectivity' plays a role in how resilient marine reserve networks are in the face of climate change, and can help inform decisions made on the ground." Erin remains optimistic that with proper management, environmental and economic interests do not have to be mutually exclusive.

Despite or maybe because of all the travel to exotic coasts, Erin also has a great desire to communicate the science. That's where her experience with blogging, writing TED Ed lessons, and running the Twitter account for the Society for Conservation Biology kicks in. "I was interested in making the journal's scientific publications accessible to the broader public as well as scientific audiences." To this end, she created a fun video tutorial for scientists, showing how to compose a "tweetable abstract" – that is, the 140-character version.

Good luck, Erin. As New York Sea Grant's 2016 Knauss Fellow, we hope to follow your ocean optimism along with your future endeavors.

— Barbara A. Branca

Celebrating 50 Years
 of Putting Science to
 Work for America's
 Coastal Communities
 1966-2016



Erin Eastwood, doing research in Fiji on marine protected areas.
 Photo courtesy of Erin Eastwood

About the Sea Grant Knauss Fellowship

The Sea Grant Knauss Fellowship provides a unique educational and professional experience to graduate students who have an interest in ocean, coastal and Great Lakes resources and in the national policy decisions affecting those resources.

The Fellowship, named after one of Sea Grant's founders, former NOAA Administrator, John A. Knauss, matches highly qualified graduate students with "hosts" in the legislative and executive branch of government located in the Washington, D.C. area, for a one year paid fellowship.

New York Sea Grant Announces New Omnibus Research Projects

Mitigating the impacts of climate change and human activities on coastal community resilience, water quality and fisheries restoration are themes that connect New York Sea Grant's newly funded 2016-2017 Omnibus research projects funded through the National Oceanographic and Atmospheric Administration.



"Ocean acidification is a potential problem we have to address. The results of your research could let us know just how big a problem and how we might adapt to it."

—Co-Owner, world-renowned New York shellfish hatchery

Impacts of Climate Change and Ocean Acidification on Economically Important Shellfish in New York: Are There Effective Mitigation and Adaptation Measures?

Climate change is acidifying, deoxygenating, and warming the ocean, posing a potential threat to New York's shellfish populations. Led by **Christopher Gobler**, of the School of Marine and Atmospheric Sciences at Stony Brook University, researchers will help shellfish growers by examining how these factors affect economically-important bay scallops, hard clams and oysters, then create maps to pinpoint New York waters most hospitable to the growth and survival of each bivalve species.

To share project goals and results with shellfish growers, hatcheries and resource managers, the researchers will host an initial workshop to introduce aspects of acidification and climate change and a wrap-up workshop to share the resultant maps of NY waters that appear most hospitable to the growth and survival of each bivalve species as well as an assessment of options to mitigate the effects of climate change.

Identifying Genetic and Habitat Limitations to Cisco Restoration in Lake Ontario

Salmon fishing in upstate NY is an economic engine that could be stalled as climate change affects salmon habitat. Cornell researchers using high tech methods to predict where the fish are likely to be will share results with charter boat operators, fishery managers and the public.

Stocks of once abundant lake herring (cisco), a critical food source for salmon, have been dwindling, reducing salmon restoration success in Lake Ontario. Cornell researchers, led by **Matthew P. Hare**, Department of Natural Resources, Cornell University will identify the characteristics of suitable spawning habitat and genetic integrity of cisco, both of which are vital for a resilient cisco population and concomitant salmon restoration success.



"Sport fishing in Lake Ontario supports a multimillion dollar economy. Anglers will be keenly interested in knowing conditions that create aggregations of fish."

—NYSDEC Section Head,
Great Lakes Fisheries

"This project supports our continuing efforts to educate and engage local elected officials and the general public regarding the importance of aquatic restoration and community resilience."

—Herkimer-Oneida Counties Comprehensive Planning Program Chief Planner

Reconnecting Waters for Eels and River Herring: a Mediated Modeling Approach to Assess Receptivity to Dam Removal in the Hudson-Mohawk Watershed

Hundreds of dams and culverts in the Hudson/Mohawk watershed act as barriers for the migration of native populations of eel, blueback herring and alewife. Researchers from SUNY College of Environmental Science & Forestry, led by **Karin E. Limburg**, will engage stakeholders in key communities within the watershed to improve receptivity for dam removal and hence ensure greater restoration success of migratory fish populations.

By using three educational interventions – lectures, field trips and mediated modeling workshops – it is hoped that deeper stakeholder engagement and understanding will improve community receptivity to dam removal to restore access to spawning habitat. Results from the project will provide information about which methods or combination of methods increase community understanding and support for dam removal.



Increasing Coastal Resilience through Facilitated Zoning Code Assessment and Amendment

As communities seek to increase their resilience in the face of severe coastal storms and sea level rise, researchers from Touro Law School and Pace University, led by **Sarah J. Adams-Schoen**, Land Use & Sustainable Development Law Institute, Jacob D. Fuchsberg Law Center, Touro College, will provide practical tools and leadership training to directly assist them in amending their zoning codes.

The research team will develop presentations and training for community leaders, planners, attorneys and municipal officials on Long Island and in the New York City area involved with the development of future policies addressing sea level rise and severe storms.

Determining Degradation Rates, Products and Impacts for Prominent Plastics in Freshwater Environ

Plastic. It's everywhere. The Great Lakes contain plastic pollution comparable to that of the ocean. The vast majority of plastic particles are small enough to be ingested by plankton and other filter feeders which form the base of lake food webs. Once ingested, these plastics can serve as a source of organic contaminants to other organisms up the food chain.

A research team led by **Sherri Mason** at SUNY Fredonia will determine degradation rates within three different freshwater environments (shoreline, open-water, and estuary) utilizing laboratory-scale environmental chambers and focusing upon those plastics found to be most prominent in Great Lakes Plastic Pollution open-water surveys. The research team will assess ecosystem impacts by conducting in-lab feeding studies using zooplankton and algae to determine growth and survival rates of microorganisms both with and without microplastics incorporated into feed. Project results will fill a gap in scientific knowledge about the impacts of microplastics within freshwater habitats.

Fredonia State professor and researcher Sherri Mason speaking to the Chautauqua County Legislature prior to its vote on a local law banning microbeads in September 2015. Photo courtesy of WRFA Radio.



A new project focused on amending zoning laws, will help coastal communities bounce back from the ravages of severe storms such as Hurricane Sandy. Photo by John Baroni

Congratulations to NYSG's Helen Domske, recipient of the 2016 Distinguished Scientist award from the Western New York Science Congress. Helen has led award-winning campaigns to keep pharmaceuticals and microplastics out of NY's waters.

Pharmaceuticals in New York Waters: Effectiveness of Advanced Treatment Options, Environmental Levels and Potential Effects

Another set of contaminants in our Great Lakes and marine coastal surface waters brought on by human activity are hundreds of pharmaceutically active drugs, personal care products and their breakdown products. Using advanced chemical analysis and laboratory models, researchers at Stony Brook University and University at Buffalo, led by SBU's **Anne McElroy**, will examine how these compounds affect fish health and behavior.

The research team will conduct coordinated field sampling and laboratory analysis involving advanced mass spectroscopic chemical analytical approaches, and detailed behavioral and cellular gene expression analysis using a laboratory species model (zebrafish) and then indigenous fish species.

— Barbara A. Branca

What's New in Extension?

New York Sea Grant Extension welcomed four new specialists in the last year. Two of them, Brittney Rogers and Heather Weitzner are working at a new office location in Newark, NY.

As NYSG's Extension Aide, **Brittney Rogers** designed the New York's Great Lakes website, a comprehensive web-based resource spotlighting the importance of New York's Great Lakes region, the coastal environment, and associated recreational and economic opportunities.

[... for more on the Great Lakes go to](#)

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As NYSG's Watercraft Inspection Steward Program Leaders Trainer, she provides training to newly-developed water-based stewardship programs that include a watercraft inspection component. She is developing watercraft inspection steward program training protocol and training/outreach materials as a response to the needs of watercraft inspection steward programs across the state. This will help standardize efforts to engage recreational boaters in slowing the spread of aquatic invasive species. For more go to www.nyseagrant.org/watercraftinspection.



New York Sea Grant's Watercraft Inspection Steward Program Leaders Trainer, Brittney Rogers, staffing a display to educate boaters and fishermen about aquatic invasive species at the 2015 Empire Farm Days. Photo: NY Sea Grant



At NY's Great Lakes Nature-Based Shorelines Workshop: Shannon Dougherty, NYSDEC; speaker Scudder Mackey, Ohio Department of Natural Resources; Heather Weitzner, NY Sea Grant; and Don Zelazny, NYSDEC Great Lakes Program Coordinator.

Photo: Barbara. A. Branca

Heather Weitzner is the NYSG's Coastal Processes and Hazards Specialist for the Great Lakes region. She provides assistance and educational outreach on issues associated with shoreline erosion, erosion management and engineering, and coastal flooding and mitigation. Her professional and educational background include Coastal and Ocean Engineering with experience in consulting and research.

[... for more on nature based shorelines go to](#)

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Heather was co-organizer of a workshop in Rochester in November of 2015 entitled: A Workshop for Practitioners: Exploring Nature-Based Shoreline Erosion Management Practices Along NY's Great Lakes and Connecting Channels. New Yorkers in the Great Lakes region have experienced extreme

storm and flood events in recent years. The workshop addressed how can Great Lakes shorelines be protected from the effects of extreme weather events and everyday stresses.

Exploring the possible uses of natural materials such as sand

and vegetation for shoreline erosion management was the focus of the workshop organized by the New York State Department of Environmental Conservation (NYSDEC) Great Lakes Watershed Program, New York Sea Grant, Wisconsin Sea Grant, and other partnering federal, state and county agencies, non-government organizations, and private consultants.



An example of a nature-based shoreline. Photo: NYSDEC.

More recently, NYSG hired two new extension specialists in the marine district.

Beginning earlier this spring, **Helen Cheng** became New York Sea Grant's Coastal Resilience Specialist in a partnership with the Science and Resilience Institute @ Jamaica Bay. The outreach program that Cheng heads up focuses on community engagement and research efforts to enhance resilience for the communities within the Jamaica Bay Watershed in New York City. Her office is located at Brooklyn College.

Prior to her hire, Helen was a 2015 NOAA Sea Grant Knauss Fellow. During her fellowship year, Cheng visited the Great Lakes Environmental Research Laboratory (GLERL) where she helped to deploy data buoys on Lake Erie.

At her new job, Helen is the co-organizer of the biennial State of the Bay symposia series, initiated through a mandate of the NYC Jamaica Bay Watershed Protection Plan. This symposium brings together scientists, decision makers, and community groups to discuss relevant science knowledge and management strategies that enhance the resilience of Jamaica Bay. Helen is the co-chair for tentatively-titled, "Communities" during the 2016 State of the Bay Symposium.

She was also on the planning committee for "It's My Estuary Day," a community event that brought together school children, teachers, parents, and families engaging them to learn about, value and care for its precious, vulnerable, estuary environment.



Helen Cheng standing in front of her table display showcasing resources for resilience in New York City. Photo courtesy of Helen Cheng



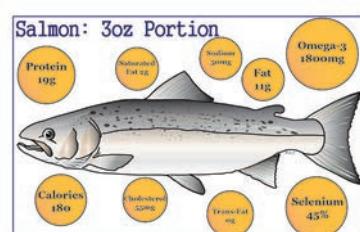
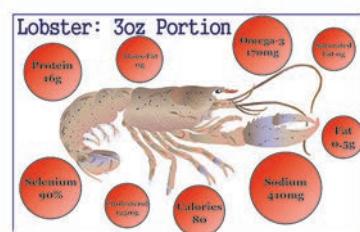
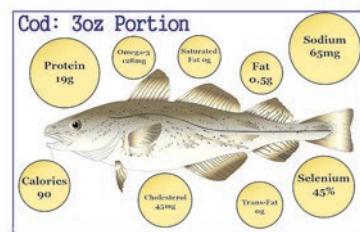
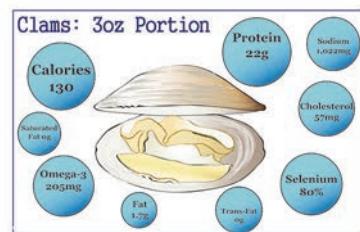
Michael Ciaramella (left), Gregg Rivara and NYSG Research Coordinator Lane Smith at the aquaculture lab at Suffolk County Marine Environmental Learning Center where Gregg is Director. Gregg's Sea Grant research project—developing local shellfish hatcheries and increasing oyster production—investigates using algae concentrate to take the place of live algae in feeding shellfish. Photo by Barbara A. Branca

In his role as New York Sea Grant's Seafood Safety and Technology Specialist, **Michael Ciaramella** works with the seafood industry, regulatory agencies and food and nutrition professionals on issues related to seafood safety, quality and marketing. Efforts include management of the National Seafood HACCP Alliance's Internet training course, and soon conducting seafood HACCP training courses in New York. Mike is currently involved with educational projects on Listeria controls in processed seafood products, seafood consumption risks and benefits, and Internet based distance education training on Good Manufacturing Practices.

Mike, located in our Stony Brook offices, has started to develop new materials for educating consumers and seafood purchasers on important topics surrounding the safety, quality and marketing of seafood (shown right). Mike is also initiating a program to increase seafood production and acceptance in New York through active education on farmed U.S. seafood products and how they complement wild fisheries.

...for more on seafood safety and technology go to

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The Hudson Is His Oyster:

Matt Hare looks at restoring oysters in the Hudson

- The fresh water in the Hudson River flows south.
- It mixes with the saltier water that the tide brings upriver from the ocean.
- Water in the upper estuary is less salty than the water below the Tappan Zee Bridge.



Mature Eastern Oyster

FRESHWATER

- When oysters reproduce, tiny larvae settle to the bottom.
- Depending on conditions only a few will grow to maturity.
- Some oysters can adapt to the differing amount of salt in the water.

SALTWATER

Tappan Zee Bridge



Oyster Larvae

- This research compared the genetics of several varieties of oysters.
- The "take-home message" is:
Oyster restoration efforts are more successful if oysters that are being transplanted are from a broodstock of a similar habitat.
- Transplanting oysters from a hatchery may not be as successful.

Genomic Analysis of Oyster Dispersal and Recruitment Success, a New York Sea Grant research project by Dr. Matthew P. Hare, Department of Natural Resources, Cornell University.

Oysters were once so plentiful in New York City that oyster shuckers worked nearly 'round the clock, feeding rich and poor alike, discarding mountains of shells. Not now.

But there is much interest in restoring oyster populations. Some habitats targeted for restoration are at the geographic and environmental edge of the oysters' ecological niche in low salinity waters of the Hudson estuary above the Tappan Zee Bridge. In Sea Grant-funded research, **Matthew Hare** of Cornell has been looking at two important genetic questions that affect plans to restore oysters in the Hudson: Is there gene flow between lower and upper estuary oyster populations low enough to cause genetic structure? And secondly, are low salinity oyster populations locally adapted by functional genetic differences, or do they survive extreme conditions by virtue of acclimating to the conditions?

Hare has studied these questions in Delaware Bay and Hudson River oysters using a combination of genomic approaches applied to gene expression and genomic polymorphism. In other words, for oysters, the size and shape matter.

What he found was genetic differences between the fresher upper the Hudson compared to the saltier lower Hudson estuary. The research team found genomic patterns consistent with limited gene flow exist between upper and lower estuary populations. This implies that local adaptation may be more multigenerational. This means in order to restore oysters using hatchery-produced oysters and ensure that they will produce viable offspring, restoration programs should use broodstock collected from a habitat that matches the planned restoration habitat.

— Barbara A. Branca

Matt Hare and Harmony Borchardt-Wier anchoring a cage of experimental oysters along the East River, Bronx, NY. Photo by Sarah Crestol.

"The goal of oyster restoration efforts in the Hudson-Raritan Estuary and elsewhere is to jump-start a population recovery. By improving habitat or using hatcheries to supplement the population it is hoped that a little effort now will promote and hasten natural recovery."

— Dr. Matthew Hare,
Cornell researcher



Sound Scholars and Stewards

NYSG's Communications staff caught up with former Sea Grant Scholar **Sean Bratton** who was last seen on the pages of NY Coastlines back in 2011 during NYSG's 40th Anniversary when former NOAA Administrator **Jane Lubchenco** visited Stony Brook University (see photo).

Says Sean of his experience with NY Sea Grant, "Being a Sea Grant Scholar was a tremendously rewarding experience. I received continuous support to complete my thesis and research. It was truly wonderful to work and collaborate with such a diverse and knowledgeable group of scientists. These experiences have continued to guide me in a successful career as a science teacher."

Since leaving Stony Brook University, Sean went back to grad school for a Master of Arts in Teaching from Sacred Heart University in 2013, then moved to Chicago where he's teaching 7th grade science at a charter, Intrinsic School, while also teaching weather-related courses as an adjunct at the College of DuPage, the second largest provider of undergraduate education in Illinois.

At Stony Brook's School of Marine and Atmospheric Sciences, professors **Brian Colle** and **Robert Wilson** were his mentors. With them he recently published a journal article based on their collective research on *Long Island Sound hypoxia: Evidence for Directional Wind Response in Controlling Inter-annual Variations in Duration and Areal Extent of Summertime Hypoxia in Western Long Island Sound*.

Now that Sean has newfound expertise in communicating science, we collectively wrote a brief synopsis of the research, putting it in terms everyone can understand!

Summertime hypoxia (low-oxygen water conditions) in Long Island Sound is correlated with local wind forcing. Winds can significantly modify stratification different layers of water at different temperatures within the Long Island Sound estuary. If wind mixes or churns up the water, then there is less chance that a low-oxygen or hypoxic layer would remain undisturbed at the bottom.



Sean Bratton, former Sea Grant Scholar discusses hypoxia with Jane Lubchenco, former Under Secretary of Commerce and administrator for NOAA. Photo by Barbara A. Branca

Specifically this research found that winds out of the east-northeast are most correlated with short term (1-2 day) increases of bottom dissolved oxygen and were termed "mixing events." In contrast, winds out of the south-southwest are most correlated with sustained hypoxic conditions over western Long Island Sound.

Additionally, summertime high-pressure systems north of LIS account for a large percentage of the aforementioned mixing events that can influence both the duration and the extent of summertime hypoxia by producing periods of sustained winds out of the east-northeast range.

Low dissolved oxygen levels may lead to hypoxic conditions in Long Island Sound and its tributaries, conditions detrimental to marine life.

In the Sound Stewards program organized by NY Sea Grant's Long Island Sound Outreach Coordinator **Amy Mandelbaum**, students participate in real-world research by measuring the dissolved oxygen content and other water quality parameters in designated Long Island Sound Stewardship Areas.

The data collected by Sound Stewards are used by managers at New York State Parks to determine areas of concern.

— Barbara A. Branca



Student stewards collect and analyze water samples along Sunken Meadow Creek at Sunken Meadow State Park in Kings Park, NY, a designated LIS Stewardship Area. Photo by Amy Mandelbaum, NYSG/LISS.

From the Director

"When you come to a fork in the road, take it!"

Yogi Berra as life coach or organizational management guru? Well no, not really. But, this alleged Yogi-ism does remind me that it's the strategic planning season again at New York Sea Grant. Every four years, we take a step back to look at what we have been doing, assess the constellation of current and looming coastal issues facing New York, match the issues against the types and amounts of the (limited) resources at our disposal to address them and decide which problems will command the majority of our

attention over the next four years. Those will be the issues on which we think we can make the biggest impact. We cannot travel all of New York's coastal roads simultaneously. Which roads to choose?

This past mid-winter, our Extension staff sought input from a wide array of stakeholders to help us set priorities for the 2018-2021 planning period. We have reached out in similar fashion to our Program Advisory Council and current/recent Sea Grant-supported graduate students and fellows. As we resurrect a printed edition of our newsletter, *New York Coastlines* with this issue, I offer you, the reader, an opportunity to contribute

to this direction-setting process. We fund applications-oriented research on important coastal problems and pair this with targeted education and public outreach programs to help deliver science-based information to those in New York's coastal communities who need it.

If you were the sitting Director of New York Sea Grant, where would you focus the program's energies, and why? Reach me at william.wise@stonybrook.edu. Suggestions received by the end of July 2016 will be most useful.



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Sharon.O'Donovan@stonybrook.edu. Information provided to NYSG will not be shared with any third party.

Journal Reprints

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Fact Sheets

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Weitzner, Heather. 2016. Effects of Erosion and Accretion on Coastal Landforms. Fact sheet. 6 pp.

Report

Bunting-Howarth, K., D. MacNeill, J. Spaccio, R. Schneider, B. Weidel and A. DeGaetano. 2016. Using Future Scenarios to Identify Potential LAMP and Watershed Planning Measures for Climate Change Adaptation along Lake Ontario: Stakeholder Generated Recommendations — A Report for Lake and Watershed Planners. NYSGI-W-15-001. 29 pages.



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Director
William Wise

Associate Director
Katherine Bunting-Howarth

Managing Editor/Writer
Barbara A. Branca
Barbara.Branca@stonybrook.edu

Web Content Manager/Writer
Paul C. Focazio
Paul.Focazio@stonybrook.edu

Design and Production
Sharon A. O'Donovan
LC Graphics

Publications
Sharon A. O'Donovan

www.nyseagrant.org
New York Sea Grant provides equal opportunities in employment and programming.
New York Sea Grant Institute
125 Nassau Hall
Stony Brook University
Stony Brook, NY 11794-5001
631.632.6905
For a list of NYSG's offices and staff, click on "Contact Us" > "Staff" at www.nyseagrant.org

