Currents

Bunting-Howarth Becomes New York Sea Grant Associate Director


Photo by Joanna Wilson

Katherine Bunting-Howarth, Ph.D. became New York Sea Grant's Associate Director in April 2011.

In early April, **Katherine Bunting-Howarth**, **Ph.D.**, **J.D.**, began her dual role as both New York Sea Grant Associate Director and Assistant Director for Cornell Cooperative Extension—Coastal Programs. From her office in Rice Hall on the Cornell campus in Ithaca, Bunting-Howarth is now the program leader for New York Sea Grant's Extension program supervising over a dozen experienced specialists and their support staff in seven locations throughout the state.

"It is great to have Kathy come onboard during New York Sea Grant's 40th year of "Bringing Science to the Shore," said **Dr. Jim Ammerman**, New York Sea Grant Director. "Our statewide program of integrated coastal research and extension activities will greatly benefit from her policy and legal background as well as her agency experience."

"I am extremely pleased to have Dr. Bunting-Howarth joining Cornell University in this leadership role; she brings a wealth of knowledge and experience to this position," said **Dr. Helene Dillard**, Cornell Cooperative Extension Director and Chair of NYSG Board of Governors.

"Working with people is my passion and I am thrilled to be leading such a talented group of extension specialists," said Bunting-Howarth. "If we are to successfully 'Bring Science to the Shore,' we need to work together as a team--extension specialists, researchers, resources managers and resource users—in order to build trust and relationships so that the knowledge gained from science will be utilized by those living, working and recreating around the shore."

"New York Sea Grant's Extension staff looks forward to introducing Dr. Bunting-Howarth to stakeholders in our coastal communities as a new partner interested in meeting their needs with timely science-based information," said New York Sea Grant Coastal Education Specialist **Helen Domske**, who most recently served as Interim Associate Director.

Bunting-Howarth has had diverse experiences working with people whose livelihoods are linked to coastal resources—people who govern and manage these resources, and researchers who endeavor to learn more about the functioning of the coastal environment. Bunting-Howarth comes to New York from Delaware's Department of Natural Resources and Environmental Control (DNREC) where she began in 1998 serving the Division of Water Resources with distinction in a variety of roles culminating in the position of Director overseeing a staff of 160 employees. "I have spent the last few years making decisions and recommending policies based on the best available science so I recognize the importance of timely science designed for management. I look forward to influencing research and translating it for coastal stakeholders." Bunting-Howarth holds a Ph.D. in Marine Studies and a B.A. in Biology and International Relations from the University of Delaware as well as a J.D. from the University of Oregon School of Law.

Even in these times fraught with economic, environmental and global uncertainties, Bunting-Howarth is excited to be presented with so many opportunities. "Our economy is challenging us to use our funding wisely. I look forward to expanding upon current partnerships and building new ones in order to ensure that we leverage our dollars and invest our time and resources in areas where we can gain multiple benefits. Let's look for research questions and extension opportunities that address multiple environmental and economic concerns be they related to habitat, water quality, coastal hazards or sea level rise."

Bunting-Howarth has already hit the ground running, meeting various program advisors, stakeholder groups and partners throughout the state. But how will she make the transition from the mid-Atlantic to upstate New York? "My two boys are excited for real snow and my husband and I are looking forward to New York's diverse topography. There aren't many hills and mountains on the Delmarva Peninsula. I'm ready for Ithaca's mud season!"

Bunting-Howarth can be reached at 607-255-2832 or keb264@cornell.edu.

—Barbara A. Branca

@nyseagrant.org
On Facebook & Twitter

...for more on this issue's stories, other news items, and links to our Facebook, Twitter, YouTube pages and RSS feed.

Discover Clean & Safe Boating Campaign a Hit with Industry

Photo by Dave White

Slowing the spread of aquatic invasive species is an added focus of the 2011 *Discover Clean & Safe Boating* campaign developed by New York Sea Grant in partnership with the Boating Industries Association of Upstate NY and Marathon Boat Group. For more, click on "Topics" at www.nyseagrant.org/marina

Helping boaters and watercraft users learn what they need to legally, safely and cleanly boat on New York waters is the mission of the *Discover Clean & Safe Boating* campaign. Providing information on how they can prevent the spread of aquatic invasive species is an added focus for 2011.

The campaign, created in 2008 by New York Sea Grant Coastal Recreation and Tourism Specialist **Dave White**, is a collaboration of New York Sea Grant, the Boating Industry Association of Upstate New York, Yamaha/Clayton Marina, and Marathon Boat Group.

Marathon Boat Group has donated the use of a 16-foot "made in New York" Grumman Oneida fishing boat and a 129" canoe for the 2011 campaign; it provided a pontoon boat for the 2010 tour.

Morgan Recreational Supply and Taylor Made Products, both headquartered in New York State, have equipped the boat with the gear required and recommended for clean and safe boating on NY waters.

Event organizers are specially requesting the exhibit. By September 2011 the *Discover Clean & Safe Boating* exhibit will have engaged New Yorkers at all but one of the major marine trade association boat shows in upstate and at a variety of waterfront events along New York's freshwater shoreline.

Information from the national Stop Aquatic Hitchhikers project will be available at the exhibit, which encourages diverse types of groups and individuals to use easy-to-implement practices to make a positive impact on slowing the spread of aquatic invasive species.

Aquatic invasive species can damage boat engines and steering equipment, reduce native game fish populations, degrade ecosystems, make lakes and rivers unusable by boaters and swimmers, and impact the economies of waterfront communities. White recently received a BoatUS Foundation commendation recognizing the creation of this consumer education campaign.

—Kara Lynn Dunn

A New Role for 30–Year Veteran O'Neill

As New York Sea Grant celebrates its 40 years, we say good luck to NYSG's longtime invasive species "guru" **Chuck O'Neill** as he transitions from New York Sea Grant to Cornell Cooperative Extension. Says O'Neill, "It's been an interesting 30 years with NYSG. Although, I've seen a lot of changes, we've not changed our extension philosophy, only the way we deliver information. We still go to our audiences with solid, science-based information to help them make their own informed decisions, not make decisions for them."

In his new role as Coordinator of Extension Invasive Species Programs, O'Neill directs the New York Invasive Species Clearinghouse (NYIS.INFO) and coordinates the Cornell Cooperative Extension Statewide Invasive Species Extension Program, which includes supervising county-based regional invasive species educators as well ensuring that aquatic invasive species outreach remains an integral part of New York Sea Grant Extension's overall programming.

O'Neill, a geologist by training, started with New York Sea Grant working on shoreline erosion and lake level education programs in the western counties bordering Lake Ontario. "But then in the 1980s came a paradigm shift in our extension program. We began to see thematic specialists in the Great Lakes—extension educators working specifically with researchers in their areas of study. This focus helped our extension program to shine with expertise."

The rapid succession of aquatic invasive species into the Great Lakes provided O'Neill with the opportunity to refocus and evolve into an internationally known invasive species "expert." As a coastal geologist, O'Neill had worked closely with coastal engineers on the siting of bridges and dwellings as well as with the operators of drinking water and power plants on water intake issues. Then in 1989 along came a new invasive—zebra mussels—which foul intake pipes and cause millions in damage. O'Neill had the background and could talk the "lingo" of plant managers about the mitigation of problems caused by what the *New York Times* called "those pesky mussels."

He and NYSG's fisheries specialist **Dave MacNeill** knew that the zebra mussel invasion was going to be the next big issue in the Great Lakes. They got squarely in front of it, brought in researchers and traveled throughout New York making facility operators aware of the impending problem; they soon carried that message nationally. O'Neill became the director of The Zebra Mussel Clearinghouse, a repository for research on this issue originally funded by utilities, then expanded it to all aquatic invasive species when it became Sea Grant's National Aquatic Invasive Species Clearinghouse. When O'Neill received queries about plants growing along streams, too, he expanded the site to terrestrial as well as aquatic invasives. Thus began the NY Invasive Species Clearinghouse and its Web site NYIS.INFO.

"These invasive species outreach projects have been a long time in the making," says O'Neill. "You can count on NYSG Extension and Cornell Cooperative Extension becoming the portals through which the public can find what they need to know about invasive species."

—Barbara A. Branca

Invasives to Watch

Back in 2001 for New York Sea Grant's 30th anniversary, we asked **Chuck O'Neill** to compile a list of "*30 Invasive Species to Watch*." Now, ten years later, we asked him what new invasive species are the ones to watch now? O'Neill put three at the top of his list: a big fish, a shrimp and a single-celled algae. The Asian carp, long a food staple in China, with its great size and jumping ability is a threat to the Great Lakes ecosystem. The diatom *Didymosphenia geminata* creates dense mats that cover the bottoms of streams and rivers and is nicknamed "rock snot" for its gooey appearance. Then there is the bloody red shrimp, *Hemimysis anomala*. With NYSG funding, **Drs. Lars Rudstam** and **Brent Boscarino** (see photo right) of Cornell University have investigated the behavior, physiology, and population dynamics of *Hemimysis*, to see if this invasive is disrupting the Lake Ontario food web by competing with native invertebrates known as mysids. Their research findings are helping to inform management decisions in the Great Lakes.

Last Wave

Ordering Publications

Go to www.nyseagrant.org, click on "Publications"> "Search & Request" and fill out our publications request form or email requests to: Susan.Hamill.1@stonybrook.edu. Also, sign up to become an on-line subscriber and receive E-mail alerts about future issues of *NY Coastlines*.
Information provided to NYSG will not be shared with any third party.

Journal Reprints

Goto, D., and W.G. Wallace. 2010. Bioenergetic responses of a benthic forage fish (*Fundulus heteroclitus*) to habitat degradation and altered prey community in polluted salt marshes. *Canadian Journal of Fisheries and Aquatic Sciences* 67: 1566-1584.

Goto, D., and W.G. Wallace. 2010. Metal intracellular partitioning as a detoxification mechanism for mummichogs living in metal-polluted salt marshes. *Marine Environmental Research* 69(3): 163-171.

Goto, D., and W.G. Wallace. 2009. Influences of prey- and predator-dependent processes on cadmium and methylmercury trophic transfer to mummichogs (*Fundulus heteroclitus*). *Canadian Journal of Fisheries and Aquatic Sciences* 66(5): 836-846.

Stasiewicz, M.J., M. Weidmann, and T.M. Bergholz. 2010. The combination of lactate and diacetate synergistically reduces cold growth in brain heart infusion broth across *Listeria monocytogenes* lineages. *Journal of Food Protection* 73(4): 631-640.

Collaborative Publications

Eastern Lake Ontario Dunes and Wetlands Fact Sheet Series. M. Penney. 2010. This series of eight fact sheets produced by New York Sea Grant focuses on the various components of the Eastern Lake Ontario Dunes and Wetlands Area. Titles include: *Arrangement and Development of Eastern Lake Ontario Wetlands* (co-authored by M. Distler); *Bog Buckmoth* (co-authored by S. Bonanno); *Common Beach Litter*; *Dune Building Plants*; *Hybrid Cattails* (co-authored by M. Distler); *Muskrat*; *Sediment Along the Beaches and Dunes of Eastern Lake Ontario* (co-authored by S. Bonanno and C. Lajewski); and *Yellow Perch*. The New York State Department of State, Division of Coastal Resources provided project funding. Other project partners include the New York State Department of Environmental Conservation, Oswego County BOCES, Oswego County Soil and Water Conservation District, The Nature Conservancy, and Town of Sandy Creek. Available online at www.nyseagrant.org/lodune - click on "Publications"

@nyseagrant.org
On Facebook & Twitter

...for more, click on "Publications" at www.nyseagrant.org/lodune


Photo by Lars Rudstam

Postdoctoral fellow Brent Boscarino (r.), former Sea Grant Scholar under Dr. Lars Rudstam of Cornell University, collects a water sample assisted by USGS student contractor, Catherine Gumtow. Boscarino will compare its phytoplankton contents with samples taken during daylight hours to learn more about the feeding preferences of the invasive mysid *Hemimysis anomala*.

Dose of Reality: Sea Grant Educates on Unwanted Meds

New York Sea Grant has partnered with the Pennsylvania, Ohio, and Illinois-Indiana Sea Grant programs to help consumers act to keep unwanted medications and chemicals out of the Great Lakes. In Fall 2010, the Great Lakes Sea Grant Network members began a "Dose of Reality" education campaign and, earlier this spring, NYSG's Coastal Education Specialist Helen Domske authored a four-page companion brochure, "Undo the Environmental Chemical Brew: Keep Unwanted Medications & Chemicals Out of the Great Lakes."

— Paul C. Focazio

Penney Named Coastal Community Development Specialist

As NYSG's new Great Lakes Coastal Community Development Specialist, **Mary Penney** is currently undertaking a community-driven needs assessment survey that will help local decision makers identify priority issues and will work with community leaders to respond to the issues of the Eastern Lake Ontario region and its tributaries, including the Salmon River. Her services are especially needed by the more rural towns and villages that do not already have the type of resources that Sea Grant can provide to facilitate planning and decision making.

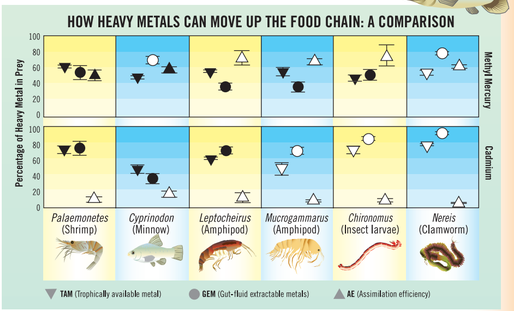
Penney will assist local leaders interested in land use planning, watershed protection, science-based sustainable renewable energy discussions, and managing climate change impacts. Penney will also be developing local volunteerism opportunities and will supervise a team of coastal natural resource educators.

Penney has been an educator with New York Sea Grant since 2006. She can be reached at New York Sea Grant, SUNY Oswego, 315-312-3042.

— Kara Lynn Dunn

...CoastWatch

Continued from page 1



The chart compares how two kinds of metal (methyl mercury and cadmium) are transferred to mummichogs after they consumed a variety of prey. Metal transfer occurs in three steps: 1. Metal is bound to the TAM of prey (percentage shown by an upside down triangle). 2. Metal is released into the gut fluid of the predator (circle) and is free to be assimilated. 3. Then, if the conditions are right for transfer across the gut lining, the metal is indeed assimilated by the predator (triangle). When a fish consumes a shrimp, the percentages of mercury available in the tissue, released into gut fluid, and assimilated by the predator are similar in value; these similarities are indicated by the darkened symbols. The results are quite different for cadmium; although there is available metal in the tissue and in the gut fluid, very little metal is assimilated.

According to Wallace, methyl mercury is a driving force in creating the food web found in the moderately polluted creeks surrounding the Arthur Kill. A common small predator is the mummichog, a chubby little fish that that travels in schools in marshes along the northeast coast. (The name comes from a Native American phrase meaning "going in crowds." People use them for bait, too, and usually refer to them as killifish or "killies.")

Because mummichogs lay their eggs near the high tide mark where they are exposed to the air, their tolerance for poor, low-oxygen conditions make them an important part of the food web in the polluted marsh ecosystems, preying on small invertebrates and minnows and then in turn, becoming prey to larger fish or shore birds on the next trophic level of a food chain. Wallace and his team used these fish in a series of experiments to examine the interactions between mummichogs and their prey. Some of their results are summarized on the chart.

Let's say a mummichog swallows a worm and begins digesting it. Enzymes break down the tissues and proteins, releasing the metal. In the case of the worm, a very large percentage of the metal within its tissues is bound to proteins making the metal readily available to predators. Scientists call this the trophically available metal fraction or TAM. Once digestion has taken place, breakdown products become soluble and are free to move across the gut lining and become assimilated into the fish. In the case of methyl mercury, almost all of the available metal (TAM) comes out of the protein and crosses the gut lining. That happens because the mercury is bound to an organic portion which makes it fat soluble and thus compatible with the lipid layer of the gut lining.

In the case of cadmium, while the amount of the metal bound as TAM in prey and the amount released into gut fluid (for some prey) can be nearly equal, very little of this metal is taken up by the fish. "That's because cadmium cannot so easily cross the gut lining, which tempers the assimilation of the metal," says Wallace.

There are several different factors that come into play in determining how metals are transferred from one trophic level to the next. First there is the metal in the sediment or the water column and how much of that the prey takes in. Then the prey may have some way of detoxifying the metal, like putting metal into granules or binding it to proteins. These are both prey-dependent and prey-specific factors. Then there are factors that are predator-dependent like the predator's physiology, digestion process, and assimilation rates.

Knowing which organisms are able to sequester and detoxify metal contaminants may be of interest to those municipalities doing habitat restoration work in urban areas. And knowing which predators digest and assimilate metals from their prey and those that excrete the metals back into the water column might also be of interest to managers planning restoration efforts. Although metal concentrations in the water column have been going down, sportfish consumption advisories for fish caught by anglers in contaminated areas like the Arthur Kill have been in effect for decades and will likely continue for some time to come.

— Barbara A. Branca

NEW YORK Coastlines Sea Grant New York

Sea Grant New York

Director
James Ammerman

Associate Director
Katherine Bunting-Howarth

Assistant Director
Cornelia Schlenk

NEW YORK COASTLINES
Vol. 40, No. 2 Spring 2011

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

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

Contributing Writers
Kara Lynn Dunn

Layout and Production
Sharon A. O'Donovan
LC Graphics

Publications
Susan M. Hamill

New York Coastlines is a product of NYSG's project C/PC-10 funded under award NA07OAR4170010 granted to the Research Foundation of SUNY on behalf of NYSG from the National Sea Grant College Program of the US Dept. of Commerce's NOAA. Sea Grant is a national network of 32 university-based programs whose research and outreach programs promote better understanding, conservation and use of America's coastal resources. NYSG is a joint program of the State University of New York and Cornell University.

This newsletter is also available at: **www.nyseagrant.org**

New York Sea Grant provides equal opportunities in employment and programming.

New York Sea Grant Institute
121 Discovery 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

New York Sea Grant
121 Discovery Hall
Stony Brook University
Stony Brook, New York
11794-5001

NONPROFIT
U.S. POSTAGE
PAID
UNIVERSITY AT
STONY BROOK

ADDRESS SERVICE REQUESTED

New York Coastlines is printed on recycled paper and may be made available in an alternative format

From the Director...

Welcome to New York Sea Grant's (NYSG's) Spring 2011 *New York Coastlines* issue, though it barely feels like spring in New York. It is was almost a relief to spend a few days in the Texas heat recently, while participating in a site review of the Texas Sea Grant Program at Texas A&M University. The big news is the arrival of **Dr. Kathy Bunting-Howarth** at Cornell University as our new Associate Director for Extension, after more than two years of capable but interim direction by several members of our extension staff. Read about Kathy's goals, interests, and background on page 3. It is great to have her on board, particularly in our 40th Anniversary Year!

We kick off the spring of this anniversary year by announcing our newly funded research projects, each one selected because it addresses an issue important to New York waters. NYSG recently conducted two rounds of research proposal review: one for our core research program valued at over $882K, and a special one for Long Island Sound conducted jointly with Connecticut Sea Grant with $1.28M in funding from EPA's Long Island Sound Study (LISS). As a result, 11 new research projects have just begun. Much of the funded core research builds upon previous successful NYSG projects from a variety of focus areas, but all are directed at improving management outcomes in New York waters.

Funded projects include: an evaluation of benthic habitat classification schemes in coastal marine systems, management of risk from Viral Hemorrhagic Septicemia Virus (VHSV) in bait minnows in the Great Lakes region, development of mitigation strategies to reduce the impact of Quahog Parasite Unknown (QPX) disease on hard clam transplant fishery, stock identification of summer flounder using advanced genetic techniques, and future changes in east coast storms and their impact on coastal inundation.

@nyseagrant.org
On Facebook & Twitter

...for more on NYSG's funded research projects

Several of the new Long Island Sound projects focus on nitrogen in the Sound, since it is historically a major contributor to plankton growth and oxygen depletion. These projects examine nitrogen inputs, removal processes, and impacts in various parts of the Sound. Another project will probe the effects of increasing populations of gelatinous zooplankton (jellyfish and their relatives) on Long Island Sound food webs and oxygen depletion. A final project looks at the causes of increased toxic Harmful Algal Blooms (HABs) in Long Island waters. New York Sea Grant is currently reviewing another round of proposals for our core research program, and anticipates funding another 8-10 new projects next year.

Photos by William G. Wallace

Students from the College of Staten Island, under the direction of Dr. William G. Wallace, collecting invertebrates such as worms and clams from Great Kills Harbor for use in their studies examining the trophic transfer of metals in marine food chains.

CoastWatch...

Heavy Metal in the Food Chain

Cadmium, copper, lead, mercury, nickel, silver, zinc: all are metals that have a place in our industrialized world. But they also can be toxic to the living things of our air, land and sea…particularly when they occur in concentrations typical of urban environments like New York City.

As far back as the 1880s, tons of mercury from industrial processes were dumped into parts of the New York / New Jersey Harbor Estuary (the Hudson-Raritan basin) annually, culminating in the high levels of contamination associated with the mid-1970s. But due to a greater awareness of these contamination issues, the implementation of clean air and water legislation, and more stringent pollution prevention initiatives, mercury discharges are now estimated to be less than those that occurred in the 1880s. However, high concentrations of some contaminants still remain in some sediments (Hudson River Foundation's report, *Health of the Harbor: The First Comprehensive Look at the State of the NY/NJ Harbor Estuary 2004].*

Today, municipalities and communities are trying to restore bays and marshes to provide better habitat for native species. However, it appears that the food webs taking shape are not as they may have been in a pre-industrial time. Species that are sensitive to metals may have already disappeared from the scene, while those that are tolerant of such conditions can often dominate these impacted systems. A research team from the College of Staten Island led by **Dr. William G. Wallace** and Sea Grant Scholar **Daisuke Goto** looked at how metals move up the trophic levels of a food chain. In a series of research papers published over the last several years, this team observed that local invertebrates have different ways of storing metal internally and that this internal storage and the digestive processes of their predators can control the transfer of metal up food chains.

Wallace and his students took samples near the College of Staten Island and its environs, including the industrial Arthur Kill. (Note: "Kill" is Dutch for "stream" and was so named when New York was New Amsterdam.) They collected common species like shrimp and worms and found that generally these invertebrates tolerate metals. "They can handle some level of contamination because they internally detoxify the accumulated metal by binding it to a special protein or by producing 'kidney stone' type concretions," says Wallace.

Although metal concentrations in the water column have decreased significantly over the last three decades, local water bodies such as the Arthur Kill still have elevated levels. For instance, according to the *Health of the Harbor* report, although mercury loadings into New York Harbor have decreased in the last few decades, sources of this toxic metal still exist from wastewater, landfills, and airborne release from power plants. Furthermore, mercury from previous contamination events may remain in the sediments and become biologically available, either as inorganic mercury or the more dangerous methyl mercury.

Continued on page 2