The common reed, *Phragmites australis*, has invaded many wetlands throughout North America.

Photo by Barbara A. Branca

New York Coastlines

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Spring/Summer '09 A Publication of New York Sea Grant Vol.38/No.1

A DELICATE BALANCE

A fresh breeze makes the reeds sway gently on a balmy afternoon. They look harmless enough, even beautiful. Yet these invasive reeds, *Phragmites australis*, have been crowding out native species like cattails and cordgrass in wetlands all over North America, changing the delicate balance that makes wetlands productive nurseries that support diverse aquatic life.

According to **Drs. Eric Nelson** and **Bernd Blossey** of Cornell University, this invasive plant may be thriving because of its tolerance for microscopic pathogens that live below in the wetland mud. In a newly-funded NYSG research project, this research team will explore the relationships between *Phragmites australis* and soil pathogens. Their research results could provide key insights for developing breakthrough management strategies to curb the Phragmites invasion that threatens native plant and animal species and decrease its impact on wetland ecosystems.

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FROM THE DIRECTOR

This is my first "*From the Director*" column for *New York Coastlines* as the new Director of New York Sea Grant (NYSG). It has been a very busy six months for the program with numerous state and federal budget issues, meetings of the Program Advisory Council, the Board of Governors, and the NYSG statewide staff. At the behest of the national office, we are currently deep into the process of developing our new strategic and implementation plans for the next five years, as are all the 32 Sea Grant Programs. Though we have already requested and received input from many of our stakeholders, it is never too late to send me an email about your thoughts on these plans (james.ammerman@stonybrook.edu).

There have also been some important personnel transitions in the program, particularly the retirement of **Dale Baker**, our Associate Director, who retired at the start of 2009. Dale directed our extension program from our NYSG office at Cornell University in Ithaca, and had served NYSG for 15 years and within the Sea Grant network for an amazing 36 years. Among other issues, Dale was active in extension efforts on both aquaculture and climate change and will be missed (see page 10, Fall 2008 *Coastlines*). Since Dale's retirement, **Robert Kent** has served ably as Interim Associate Director. Though located in Riverhead on Long Island, Bob has been making periodic visits to Ithaca. We will soon be starting a search for Dale's permanent replacement. Please stay tuned. Additionally, **Dr. James MacDonald** recently joined NYSG as a Recreational Fisheries Specialist for the popular I FISH NY Program in New York City.

However, the most important recent happenings at NYSG are the research, education, and outreach activities detailed in this issue of *New York Coastlines*. We have recently committed over $4.46 M for research from both our regular biennial grant competition for New York coastal projects (14 projects, see page 1), as well as an additional special competition for projects focused on Long Island Sound (LIS, 5 projects, see page 10). The LIS projects are managed jointly with Connecticut Sea Grant with funding support from the US Environmental Protection Agency's LIS Study.

We also recently conducted a meeting of the LIS project investigators which should facilitate scientific and logistical collaboration.

Sea Grant Scholars, graduate students especially recognized as integral to our sponsored research projects, have long been an important part of our research and education efforts. In additional to supporting them as part of the research projects, we track their progress during and after the project. A profile of several of our past Sea Grant Scholars begins on page 4, including NYSG's own **Dave MacNeill**, who describes some of his own current fisheries extension activities in the Great Lakes.

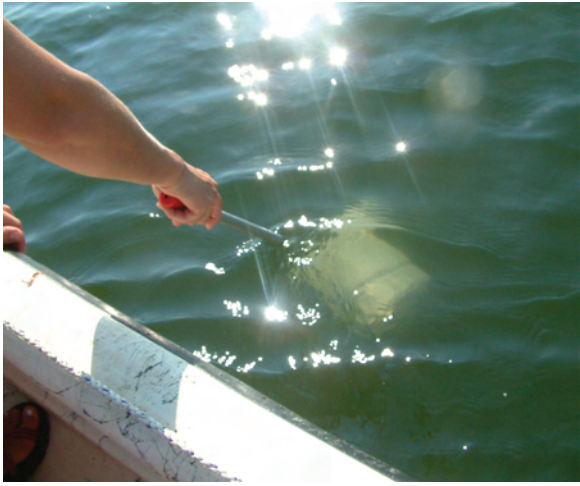
Our recent "*Return Unwanted Medicines*" event was an overwhelming local success and has generated great interest for holding similar events in other communities (page 6). It represents the best in collaborative outreach among NYSG, various parts of Stony Brook University including the Medical Center, and local legislators. Additional outreach and research efforts concerning stormwater and groundwater inputs to Long Island estuaries, as well sport fishing, are described on pages 8 and 9.

Finally, I want to highlight the publication of the hard clam report, a major synthesis of NYSG's *Hard Clam Research Initiative* (page 8) and an important contribution to the available knowledge. In closing, the period since I became Director of NYSG on October 15, 2008 has been one of continuous activity with much more yet to come.

Dr. David Conover, left, Dean of the School of Marine and Atmospheric Sciences, discusses new research directions with Dr. James Ammerman, Director of New York Sea Grant.
Photo by Barbara A. Branca

A DELICATE BALANCE

continued from page 1



In a newly-funded project, researchers will examine the role sediments play in nitrogen dynamics in the Peconic Estuary. Photo by Barbara A. Branca

To address the complex relationships and help restore balance in our state's diverse aquatic and marine ecosystems, NYSG is funding 14 new research projects that will span the state. NYSG has awarded $1.32 million for the first year of these projects and committed an additional $970,858 for the second year. The projects include a cost share commitment of $1.35 million bringing their total project value to $3.64 million.

Along the Hudson River, great strides have been taken to improve water quality and restrict contaminants like PCBs. But within the sediment of the river bottom, worms ingest these decades-old persistent contaminants, become food for song birds, and potentially deliver to them a sub-lethal dose of PCBs. What results, say **Drs. Timothy DeVoogd** and **Andre Dhondt** of Cornell University, is that brain activity can change and ultimately alter a bird's song. In a newly funded project, this team will help to develop new methods of detecting dangerous, but non-lethal levels of PCBs in the environment.

During winter, snow and ice cover a frozen Lake Erie. But below the ice cover, microscopic organisms such as algae and bacteria may be very productive, forming so much biomass that there will be an abundance of dead and decaying organisms come summertime. Decay causes a loss of bottom oxygen which in turn causes a lack of finfish—but no shortage of disappointed summer fishermen. In a new project led by **Dr. Michael Twiss** of Clarkson University, researchers will use measurements of microorganism productivity in Lake Erie to create a predictive model for summertime hypoxia, a condition of low oxygen.

From the School of Marine and Atmospheric Sciences, Stony Brook University, the research team of **Drs. Robert Aller** and **Christopher Gobler** will examine the role of nitrogen in the sediments of the Peconic River estuary as it relates to nuisance algal blooms, oxygen depletion and the subsequent loss of marine life. A more complete understanding of the nitrogen cycle will help eastern Long Island municipalities in their efforts to control nitrogen loading and design more effective management plans.

These descriptions are just a sampling of two-year projects getting their start in 2009. Several critical research projects are continuing in directions pioneered by New York Sea Grant and its distinguished cadre of top-notch researchers, many of whom are international leaders in their fields. Cutting edge methods, such as genomics, will be used to probe more deeply into issues such as the viral hemorrhagic septicemia virus (VHVS) affecting Great Lakes fish, a new invasive shrimp forcing its way into freshwater food webs, the control of the *Listeria* pathogen in ready-to-eat smoked fish, hard clam immunity against the Quahog Parasite X pathogen, the slow recovery of populations of the Atlantic sturgeon, and the delicate balance of conditions that favor eelgrass meadows of Long Island.

Barbara A. Branca

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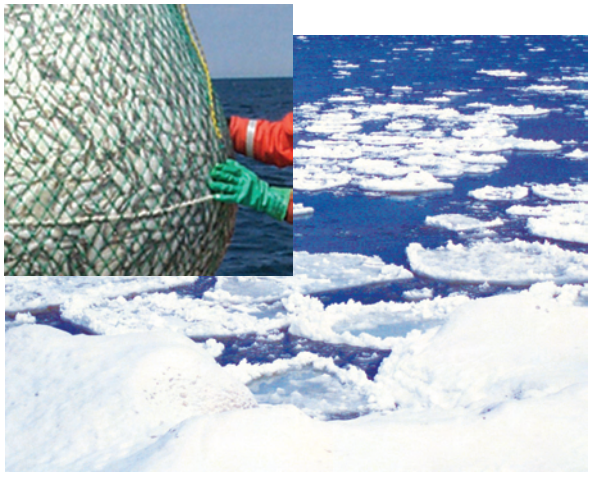
... for a listing of all of New York Sea Grant's newly funded projects



In the Great Lakes, alewives (top left) are important food for salmon and trout. *Dr. Randal Snyder* of Buffalo State is measuring alewife condition and growth so that managers can optimize salmonid stocking programs. Photo by USGS Lake Ontario Biological Station

Researchers will investigate how wintertime productivity in Lake Erie can predict summertime hypoxia. Lake Erie photo by Helen Domske

THESE SCHOLARS FOLLOW THE FISH

"Being a Sea Grant Scholar was a tremendous opportunity to get involved with some critical issues on sustainable fisheries in the Great Lakes," says NYSG Fisheries Specialist Dave MacNeill. "It certainly opened some doors and helped me to establish relationships with some top-notch scientists. Many of my contacts today I met as a Scholar."

Photo courtesy of Dave MacNeill

Since 1971, New York Sea Grant has supported nearly 600 Scholars at a total cost of over $9 million. "Our support helps optimize the students' educational experiences and provides an introduction to the philosophy of the Sea Grant Program," says **Cornelia Schlenk**, NYSG Assistant Director.

New York Sea Grant gives high priority to supporting graduate students, recognizing their importance to the conduct of university research in marine or related sciences. Student theses often impart very useful results and information that may not appear in the published literature. And many of NYSG's Scholars – including several of the fisheries specialists profiled below – have gone on to highly successful careers in government, industry and academia. Their anticipated roles as decision-makers, managers, administrators, business owners, researchers, extension specialists and teachers are critical to the future of our marine and Great Lakes resources and all who rely on them.

"It began my career in Great Lakes resources," says NYSG's **Dave MacNeill** of his Sea Grant Scholar days. "It made me realize this is what I want to do."

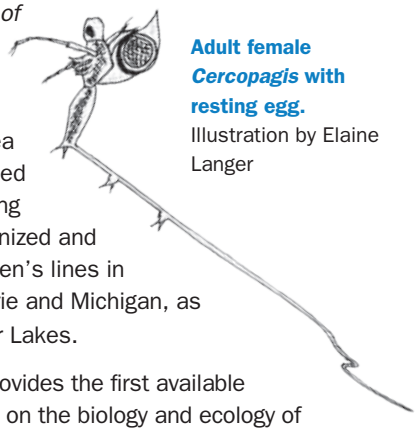
MacNeill, now a NYSG Fisheries Specialist who works closely with researchers, says, "The relevance of the research and what's going on in Great Lakes fisheries is currently a tight fit." He mentions VHS (viral hemorrhagic septicemia), a fish disease affecting muskellunge, round gobies, smallmouth bass, freshwater drum, among other fish species.

In a newly-funded two year study, Cornell University investigators **Drs. Paul Bowser** and **James Casey** are examining the transmission process of VHSV, the virus that causes the fish disease, so that better bio-safety protocols and decontamination methods can be developed. "The virus destroys the cells that line various blood vessels in the fish and causes bleeding," says Bowser. "Bleeding destroys internal organs, such as the heart, liver, spleen and kidneys, and eventually the fish dies." Over the last several years, significant mortalities have been reported in several Great Lakes fish species: muskellunge (a kind of pike), round gobies, gizzard shad, smallmouth bass and freshwater drum.

"This research is a perfect example of Sea Grant being on the forefront of an emerging issue and addressing research needs on how this disease is affecting Great Lakes fisheries," adds MacNeill.

Striking a Balance

Dave Warner is a Research Fisheries Biologist with the U.S. Geological Survey's Great Lakes Science Center in Ann Arbor, MI. Upon completing his work as a Sea Grant Scholar in 2004, Warner defended his thesis on *"The Role of* Cercopagis pengoi *in Nearshore Areas of Lake Ontario."* The nearly microscopic fishhook water flea that Warner studied is known for having successfully colonized and clumping fishermen's lines in Lakes Ontario, Erie and Michigan, as well as the Finger Lakes.



Adult female *Cercopagis* with resting egg. Illustration by Elaine Langer

"This research provides the first available basic information on the biology and ecology of *Cercopagis* in North America," says SUNY Brockport's **Dr. Joseph Makarewicz**, principal investigator, along with newly-retired **Dr. Ed Mills** (Warner's advisor) on this study.

"By developing and training scientists with large lake experience and providing opportunities to work with leading scientists in fisheries and limnology, we see the full value of the Sea Grant Scholars program

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New York's Sea Grant Scholars work on research throughout the state. For more, click on "Education" > "Publications" > "Coastlines Articles" and peruse the "Sea Grant Fellows/Scholars" section

to both the young scholar and the nation," says Makarewicz. "Dave Warner has become an important contributing member of the Great Lakes research community with an exciting future."

At USGS, Warner conducts acoustic research in Lakes Michigan and Huron and assists with other projects such as lake trout restoration. "I design, plan and implement acoustic surveys to provide lakewide assessment of prey fish biomass and distribution for use in ecological research and management of commercially and economically important predators like Chinook salmon and lake trout," he says.

"As a Sea Grant Scholar, I learned how to design and implement ecological studies in very large bodies of water," says Warner. "Also, papers stemming from NYSG research – from the ecological role of *Cercopagis* in Lake Ontario, to acoustic methods for mysids, alewife, smelt and other forage fish – are cited in a number of the papers my colleagues and I are currently writing."

"I think that NYSG research has a large impact on Great Lakes knowledge as well as day-to-day operations," he continues. "The mysis work done by [Cornell University researcher] **Dr. Lars Rudstam** led me to incorporate new sampling tools earlier this year to acoustically assess mysids in Lakes Michigan and Huron." Prior to his work under Makarewicz, Warner was also a Sea Grant Scholar on a 2002-2003 hydroacoustic population estimates project of Rudstam and **Dr. Patrick Sullivan**.

"Hydroacoustic surveys have great potential for giving us absolute estimates of forage fish abundances in the Great Lakes," says Rudstam. "Such abundance measures are necessary to correctly estimate potential production of sportfish such as salmonids and walleye."

The balance between forage fish (prey) and sportfish (predator) is crucial. In fact, one prey species, alewife, serves as the cornerstone of Lake Ontario's ecologically and economically valuable trout and salmon sport fishery. Data on the abundance of this key prey species are used by management agencies such as the NYS Department of Environmental Conservation and U.S. Fish and Wildlife Service to help set sustainable stocking levels for a variety of salmon and trout species. "Alewife supports major sport fisheries, contributing millions of dollars to the local economies, so it's important to look at what governs the production of the species," says Rudstam.

Rudstam is currently heading a two-year NYSG-funded project to forecast ecosystem effects of a new invasive species, *Hemimysis anomala* or the "bloody-red shrimp," in Lake Ontario.

Back to the Future

In the late 1980s, Sea Grant Scholar **Doran Mason** completed his thesis on *"Influences of Predation by Alewives on the Survival of Larval Yellow Perch in a Lake Ontario Embayment."* Mason, currently the Chief Scientist at NOAA's Great Lakes Environmental Research Laboratory (GLERL) in Ann Arbor, MI, studied under SUNY College of Environmental Science and Forestry (SUNY ESF) researcher **Dr. Stephen Brandt** at the same time as NYSG's MacNeill. "Both Dave and Doran have become extremely successful leaders in Great Lakes fisheries," says Brandt, new Director of Oregon Sea Grant. "Their continued interest in doing things relevant to Great Lakes communities was developed when they were Sea Grant Scholars."

Mason's project provided information to managers on the predation of alewives by larval yellow perch, the primary sport fish in New York State throughout the Great Lakes. Data helped guide management decisions regarding stocking levels and maintaining a desirable population level of these two species, as well as salmonids.

And 20 years later, interactions between these key Great Lakes fish species are just as important. "Understanding and accurately forecasting alewife condition and growth remain a high priority to support important management decisions in Great Lakes fisheries," says Buffalo State College investigator **Dr. Randal Snyder**, investigator on a new two-year NYSG-funded alewife study. This research will improve the ability to optimize salmonine stocking rates, to forecast how changes in food webs or abiotic (physical and chemical) factors will affect alewife populations, and better predict the impact of alewives on their prey populations.

Overall, MacNeill is pleased with how things have progressed professionally for Warner, Mason, LaPan (see sidebar) and other Sea Grant Scholars. "These former Scholars have gone on to do great things."

— Paul C. Focazio

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See "Theme Areas" section for more on VHS, *Cercopagis* and other Fisheries and Aquatic Invasive Species research.

Yellow perch image courtesy of Cliff E. Kraft, Dept. of Natural Resources, Cornell University.

Hemimysis anomala image courtesy of Steve Pothoven, National Oceanic and Atmospheric Administration, Great Lakes Environmental Research Lab.

TAKING STOCK

Before his days as a Lake Ontario fisheries leader at NYS Department of Environmental Conservation's Cape Vincent Fisheries Station, Steve LaPan was a Sea Grant Scholar.

His 1985 thesis on "Spawning and Early Life History of Muskellunge and Northern Pike in the St. Lawrence River" was completed in tandem with NYSG-funded research by SUNY ESF investigators Drs. Robert Werner and Neil H. Ringler.

The project provided managers with information to effectively manage these fish stocks, including their life history, habitat requirements, interactions and basic population parameters.

During the study, LaPan discovered 36 key muskellunge spawning areas in the 1,000 Islands region of the St. Lawrence River. As a result, the bays were protected from development that would have threatened these delicate spawning grounds.

The work was a springboard for LaPan's NYSDEC days, where he helps to manage the fish resource within Lake Ontario.

"By managing, we mean we evaluate the success of stocking fish, both to enhance some fisheries and to restore others," he says. "We also undertake regular surveys to monitor the health of fish stocks and to establish the effectiveness of stocking and harvest policies."

Working to make the Return Unused Medicines event a success are: from left, bottom row, Susan Eckert (aide to Suffolk Co. Legislator Lynne Nowick), Jeannene Strianse (Stony Brook University Hospital's Director of Pharmacy), Carol Malley (Stony Brook University Medical Center), Larissa Graham (NYSG, Long Island Sound outreach coordinator and event committee chair), Barbara Branca (NYSG communications manager); top row: Jeffrey Carter (SBU Environmental Health and Safety), Police Officer Robert Jones, Suffolk Co. Legislator Lynne Nowick, Yvonne Spreckels (Director Community Relations, Stony Brook University Hospital), and Stony Brook University Police Officer Edward Lazzaro.
Photo by Paul C. Focazio

RETURN UNWANTED MEDICINES EVENT A SUCCESS

After months of planning, everything and everyone was in place: the greeters at the door of the Setauket Firehouse, the volunteer pharmacists, the security and disposal teams. And a few minutes before the 10 am start, the first participant checked in his bag of unwanted and expired medications, kicking off the largest one-day collection of its kind on Long Island.

Why hold a *Return Unwanted Medicines* event? Conventional wisdom of the past has been to flush leftover medicine down the toilet. But that action only exacerbates the growing problem of pharmaceuticals in the nation's waterways. Says **Dr. James Ammerman**, Director of New York Sea Grant, the lead organization for the event, "Drugs and other synthetic chemicals are increasingly found in surface and groundwater sources, and can contaminate drinking water supplies and disrupt natural ecosystem processes." According to a 2008 Associated Press national investigative team, pharmaceutical drugs - including antibiotics, mood stabilizers, and sex hormones - have been found in the drinking water of over 41 million Americans.

Suffolk County Legislator **Lynne Nowick** had growing concerns about the potential for pharmaceuticals entering Long Island's waterways. Said Legislator Nowick, "About a year and half ago, I reached out to hospital officials throughout Suffolk County with the idea of implementing a program to take back unwanted and expired medicines from the community. The intent is to reduce human and environmental risk by protecting the water supply as medications flushed down the drain can seep into our groundwater."

Stemming from that concern evolved a concerted effort to plan a one-day collection event by several key organizations: New York Sea Grant, EPA's Long Island Sound Study, Stony Brook University, Stony Brook University Hospital, Suffolk County Legislator Lynne C. Nowick's office, Triumvirate Environmental, Inc., NYS Department of Environmental Conservation, Suffolk County Department of Health Services and Suffolk County Water Authority.

The all day event, held in conjunction with Stony Brook University's annual EarthStock, was held at the nearby Setauket Firehouse. Event chair **Larissa Graham** noted that there were 140 participants who brought with them an astonishing number of unused medications. "At the end of the day," according to Stony Brook University Hospital's Director of Pharmacy **Jeannene Strianse**, "approximately 88,000 pills had

Associate Pharmacy Director *Edmund Hayes* identifies some of the 88,000 pills collected at the event.
Photo by Barbara A. Branca

Watch

been collected as well as nearly 4 liters of liquids and 8 kilograms of powder." What happened to them? Triumvirate Environmental, Inc. of Astoria, NY, expertly packaged the 500 pounds of waste into Department of Transportation (DOT) approved containers for transport to a facility for safe and controlled incineration. "We want to thank Triumvirate for the great job and for donating their services for this important first-time event in this area," said **Jeffrey Carter** of Stony Brook University's Department of Environmental Health and Safety.

But the real heroes of the day were the pharmacists. As people walked in with their medicines, volunteers obscured their names on prescription bottles and brought bags of medications to the pharmacists' tables. There, the pills were laboriously counted and identified. What happened when pills were loose and not identified? Making an ID of pills fell to pharmacy resident **Samuel Chin** who spent the day using the Internet to classify them. A caution to anyone who would like to participate in this kind of event…always keep medicines in their original containers!

People returned prescription and over-the-counter drugs, uncontrolled as well as controlled substances. **Scott Law**, Director of Stony Brook University Police's East Campus Operations, and his associates made sure that such substances were properly handled.

Throughout the day, a parade of Long Islanders came with their medicines: a couple celebrating their 50th anniversary, young families, people with pets and their unused medicines. With the help of local papers, radio stations and magazines, people came from up to 50 miles away. Television cameras whirred to document participants and local elected officials like Legislator Nowick as well as NYS Assemblyman **Steve Englebright** and Suffolk County Legislator **Vivian Viloria-Fisher**.

In an exit survey, about a third of the participants said that they had flushed unwanted drugs in the past and 100% said they would come to this kind of event again. Since the event, several municipalities and other interested groups have asked how they could hold a similar event. So look for events that might be coming up in your area and until that time, don't flush unwanted pharmaceuticals. Check **www.nyseagrant.org** for more information.

— Barbara A. Branca

Pictured from left are volunteer pharmacists from Stony Brook Medical Center: *Caesar Alaienia*, (Pharmacy Resident), *Alireza Hayatshahi*, (Pharmacy Resident), *Melinda Monteforte*, (Infectious Diseases Specialist), *Madhuwanti Chhettry*, (Oncology Pharmacist), *Jeannene Strianse*, (Director of Pharmacy), and *Edmund Hayes* (Associate Pharmacy Director). Photo by Barbara A. Branca

When pharmaceuticals are flushed, they enter household septic systems or sewage treatment plants and can make their way into our waterways or even water supply. Follow the diagram to see how. Information courtesy of *Dr. Henry Bokuniewicz* and SBU graduate student *Ruth Coffey.* Illustration by Anita Kusick

Groundwater is water that is stored in the pore spaces of the ground and is replenished by water percolating through the unsaturated soil above. This includes rainwater and other sources. Half of the United States get drinking water from groundwater.

NEW REPORT SYNTHESIZES HARD CLAM RESEARCH

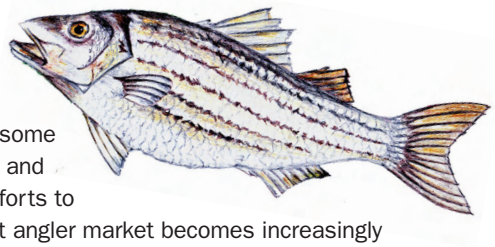
New York Sea Grant recently released *The Hard Clam Research Initiative: Factors Controlling* Mercenaria mercenaria *Populations in South Shore Bays of Long Island*, NY, a 43-page technical report that summarizes the key results of five research projects funded through NYSG's *Hard Clam Research Initiative* which began in 1999. Funding partners included NOAA National Marine Fisheries Service, South Shore Estuary Reserve, Port Authority of NY and NJ, and NYSG. These five projects and several related studies addressed the downward trend in hard clam populations in Long Island's south shore bays, an issue of both environmental and economic interest to the region.

Says **Ms. Cornelia Schlenk**, Assistant Director of NYSG who spearheaded the Hard Clam Research Initiative, "The main goal in the preparation of this report was to achieve improved, science-based understanding of the factors controlling hard clam populations in Long Island's south shore estuaries, and thereby contribute towards better management and potential enhancement of a once highly productive regional resource." Research topics within the report include: the hard clam's reduced reproductive success, changes in the clam's food supply and predators, the effects of brown tide, ecosystem changes in Great South Bay and other LI bays, and the effects of harvesting practices as predicted by clam population models. Continues Ms. Schlenk, "Particular emphasis is given in this synthesis report to findings that help us understand the stressors on hard clam populations and their implications relative to managment and moving forward."

Compiled from publications provided by the researchers, reports submitted to NYSG, and material presented at an August 2008 workshop sponsored by NYSG at the School of Marine and Atmospheric Sciences, Stony Brook University, the report was prepared by **Dr. V. Monica Bricelj** of the Institute of Marine and Coastal Sciences at Rutgers University.

— Barbara A. Branca

SEEKING WAYS TO STIMULATE SPORTFISHING



The decline in the number of anglers in New York's Lake Ontario region over the last decade-and-a-half has raised concerns. With the region's economy based to a large extent on sportfishing, NYSG-funded investigators **Drs. Diane M. Kuehn** and **Valerie A. Luzadis** from the SUNY College of Environmental Science and Forestry are exploring some marketing and management strategies that could help sustain the economies of coastal communities along Lake Ontario.

"One potential strategy is to increase fishing participation by residents of the Lake Ontario region," says Kuehn. "This would provide an opportunity for businesses and tourism promoters to tap into an underutilized and large resident market group. We will be focusing on bass fishing because many residents are already involved in it."

Redirecting some promotional and business efforts to this resident angler market becomes increasingly important as further declines in nonresident anglers – the focus of past tourism promotions – are expected due to rising travel costs and a sluggish national economy.

"By studying what motivates and prevents residents from bass fishing, we're hoping to provide businesses and tourism promoters with the marketing and management information that they need to attract anglers," says Kuehn. Investigators aim to do this by surveying residents (in the fall of 2009) on the motivations, constraints, and facilitators associated with bass fishing on Lake Ontario.

— Paul C. Focazio

SUPPORTING MUNICIPAL NATURAL RESOURCE PROTECTION

Municipal stormwater management and nonpoint source pollution control on Long Island are of vital importance to protecting estuarine resources. Polluted runoff has been identified as a primary cause of Long Island Sound, South Shore Estuary Reserve, and Peconic Estuary impairments. Among the issues, pathogen-contaminated beaches pose threats to human health, with far-reaching effects on the economy, while sediment can cause wetland degradation and disappearance of wildlife.

The **New York Sea Grant** (NYSG) **Nonpoint Education for Municipal Officials** (NEMO) Program has responded to these issues since 2001, providing technical expertise and assistance concerning EPA Phase II Stormwater Program compliance to nearly 100 Long Island municipalities. Using its primary tools: a list serve, consultations, presentations, and written feedback, NYSG NEMO has helped LI municipalities to improve their Phase II stormwater programs.

Following NYSG NEMO outreach, communities have improved construction and post-construction requirements, and procedures for site plan review and inspections. Changes include an ordinance for retention of rainwater from new driveways, and erosion and sediment controls for projects smaller than an acre. Nassau County strengthened its drainage requirements by limiting the volume of runoff allowed to be discharged into its stormsewer system and by further encouraging development practices that reduce impacts. Nassau and Suffolk counties, as well as several towns and villages, have initiated storm drain retrofit projects.

Long Island Sound, Southold, NY. The health of Long Island's estuarine resources is vital to New York's economy. Photo by Eileen Keenan

NYSG NEMO support and feedback have prompted municipalities to improve their stormwater programs in a multitude of ways. Examples include development of sustainable funding mechanisms, a septic system inspection program, equipment procurement, and inter-departmental work groups.

Given today's challenging economic times, perhaps NYSG NEMO's most enduring impact is how it facilitates cost-effective inter-municipal stormwater management. Over the years, the number of such cross jurisdictional efforts has grown; the most recent effort currently underway is in the Peconic Estuary drainage area on the Island's East End.

— Eileen Keenan, *NY NEMO Program Manager*

Contact information: ek72@cornell.edu or 631. 444.0422

TRACING SOUND INPUTS VIA GROUNDWATER

It's well understood that too much nitrogen in the water is not healthy for aquatic life in Long Island Sound. But until now it's been hard to estimate how much nitrogen has actually been coming from submarine groundwater discharge (SGD), particularly along the sandy sediments off LI's north shore. In a newly funded project, **Drs. J. Kirk Cochran** and **Henry J. Bokuniewicz** of the School of Marine and Atmospheric Sciences (SoMAS), Stony Brook University, will use naturally occurring radioactive isotopes to gauge the impact of this groundwater discharge, enabling planners to better reach their goals of improving water quality for Long Island Sound.

In a recently completed NYSG funded project, these same researchers looked at SGD into Jamaica Bay, NY. Although only a relatively small fraction of the total nitrogen that goes into the Bay via sewage treatment facilities, SGD provides the Bay with an unseen (and uncontrolled) source from both the leakage of groundwater from land and from the recirculation of seawater through the Bay's sediments.

At press time we learned that the SUNY Board of Trustees has named SoMAS Professor Henry Bokuniewicz to the title of ***Distinguished Service Professor,*** the highest honor that SUNY bestows upon faculty. Hearty congratulations, Dr. Bokuniewicz!

— Barbara A. Branca

SOUND SCIENCE FOR LIS

Several newly-funded projects will conduct experiments from the research vessel *RV Seawolf*, seen here docked in Port Jefferson Harbor on Long Island Sound. Photo by Barbara A. Branca

The Sea Grant programs of Connecticut and New York have awarded nearly $820,000 in Long Island Sound Study research grants to five projects that will look into some of the most serious threats to the ecological health of Long Island Sound (LIS), a water body designated by the U.S. Environmental Protection Agency as an Estuary of National Significance.

This research addresses the historical problem of the Sound's low oxygen conditions as well as emerging issues of red tide and the effects of climate change on the Sound's ecosystem. Research results from the two-year projects are expected to provide valuable information to resource managers throughout the LIS watershed.

Several projects will examine hypoxia–the condition of low oxygen that presents numerous environmental challenges. "The focus on the important issue of hypoxia in LIS in many of these projects should greatly increase our understanding of the detailed causes of this problem and will be important in our efforts to solve it," said **Dr. James Ammerman**, director of New York Sea Grant.

Research will be conducted on the chemical, physical, and biological factors that contribute to the hypoxic or low-oxygen conditions at the bottom of Long Island Sound. **Dr. Mark Altabet** of the Department of Estuarine and Ocean Science, School of Marine and Technology, University of Massachusetts, Dartmouth will look at the geochemistry of dissolved gases in the Sound to gain insight into oxygen exchange between surface and bottom waters. **Drs. Robert Wilson** and **Brian Colle** of the School of Marine and Atmospheric Sciences (SoMAS), Stony Brook University will partner with **Dr. Daniel Codiga** of the University of Rhode Island to evaluate the relationship between summertime storms and hypoxia.

Also at Stony Brook's SoMAS, **Drs. Darcy Lonsdale** and **Christopher Gobler** will look at seasonal temperature differences and the effects on the Sound's food web. In a separate study, Gobler will study the causes and impacts of recent red tide blooms in the Coves and waters of the Sound. **Drs. Kamazima Lwiza** and **Gordon Taylor** of SoMAS will investigate phytoplankton and microbial production and mortality and their effects on the Sound's bottom water oxygen.

"The range of projects we are funding builds squarely upon the existing body of knowledge about Long Island Sound and will fill in some of the remaining gaps," said **Dr. Sylvain De Guise**, director of Connecticut Sea Grant. "The results will help to conserve the Sound for current and future generations." "With an initial meeting this spring in Stony Brook, the researchers are off to a great start," adds NYSG's Ammerman.

"These projects will improve our understanding of some of the critical issues facing our estuary," said **Mark Tedesco**, director of the US EPA's Long Island Sound Office, which manages the Long Island Sound Study partnership, and which provided the majority of funds for the Sea Grant-administered research projects. Since 2000, the Long Island Sound grant program has awarded 26 grants to scientists whose work helps meet the needs of decision-makers to improve the management of Long Island Sound.

The Long Island Sound Study, conducted under the EPA's National Estuary Program, is a cooperative effort between the EPA and the states of Connecticut and New York to restore and protect the Sound and its ecosystems.

— Barbara A. Branca

LAST WAVE

Hard Clam Research Initiative: Factors Controlling *Mercenaria mercenaria* populations in South Shore Bays of Long Island, NY. V. Monica Bricelj. 2009. This report provides a synthesis of results from studies funded via the Hard Clam Research Initiative (HCRI) and related studies funded from other sources. The studies addressed the downward trend in hard clam populations in Long Island's south shore bays, an issue of both environmental and economic interest to the region.

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... for the entire 43-page report and a separate 7-page excerpt of the report's summary and conclusions

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Journal Reprints

Fall diets of alewife, rainbow smelt, and slimy sculpin in the profundal zone of southern Lake Ontario during 1994-2005 with an emphasis on occurrence of *Mysis relicta*. M.G. Walsh, R. O'Gorman, T. Strang, W.H. Edwards, and L.G. Rudstam. 2008. *Aquatic Ecosystem Health & Management* 11(4): 368-376.

Grazing and virus-induced mortality of microbial populations before and during the onset of annual hypoxia in Lake Erie. C.J. Gobler, T.W. Davis, S.N. Deonarine, M.A. Saxton, P.J. Lavrentyev, F.J. Jochem, and S.W. Wilhelm. 2008. *Aquatic Microbial Ecology* 51(2): 117-128.

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

In vitro investigations of quahog parasite unknown (QPX). B.B. Allam, D.M. Buggé and, M. Perrigault. 2006. *Journal of Shellfish Research* 25(2): 707.

Molecular genetic variation among QPX isolates. J.L. Collier, H. Qian, Q. Liu and, B. Allam. 2006. *Journal of Shellfish Research* 25(2): 719-720.

Range-wide population structure of shortnose sturgeon *Acipenser brevirostrum* based on sequence analysis of the mitochondrial DNA control region. I. Wirgin, C. Grunwald, E. Carlson, J. Stabile, D.L. Peterson, and J. Waldman. 2005. *Estuaries* 28(3): 406-421.

Standardization of microcystin extraction from fish tissues: A novel internal standard as a surrogate for polar and non-polar variants. J.L. Smith and G.L. Boyer. 2009. *Toxicon* 53(2): 238-245.

The diversity and distribution of toxigenic *Microcystis* spp. in present day and archived pelagic and sediment samples from Lake Erie. J.M. Rinta-Kanto, M.A. Saxton, J.M. DeBruyn, J.L. Smith, C.H. Marvin, K.A. Krieger, G.S. Sayler, G.L. Boyer, and S.W. Wilhelm. 2009. *Harmful Algae* 8(3): 385-394.

Collaborative Publication

A Guide to Fish Invaders of the Great Lakes Region. S. Moen, Ed. University of Minnesota. 2008. 38 full color illustrations. For details, visit www.seagrant.umn.edu/ais/haccp.

SKATE

While several different species of skate are common in the Northwest Atlantic Ocean, two of them, winter and thorny, are commonly used for food. Skate prefer to eat mollusks, crustaceans and small fish that give their flesh a sweet mild shellfish-like taste. The edible parts of a skate are the two "wings." Whole skate wings, with their distinct fan shape and ribbed texture, are typically available in the marketplace, sometimes completely boneless with their skin removed.

Fishermen generally catch skate from April through June and to a lesser extent from October to January using the same trawl nets for cod, flounder and other popular ocean fish living on or near the ocean floor. Few American fishermen actively fish for skate, but commercial landings in the northeast and in New York have increased over the last decade. People may be most familiar with the hard, dark, leathery egg cases of skates (called "mermaid's or sailor's purses") that typically wash up on Long Island beaches and other coastal areas.

– New York Seafood Council

SEAFOOD CORNER

Steamed Skate with Lemongrass, Ginger & Lime

Ingredients

1 ½ lb. skate fillets, pan-ready (4 portions of 6 ounces each)
1 stalk lemongrass*
3 cups orange juice
2 tbsp. butter
1/2 cup lime juice
2 tsp. fresh ginger, thinly sliced
fresh chives or scallion tops for garnish
lime slices for garnish

* If fresh lemongrass is unavailable, increase ginger to 1 tbsp. or substitute 1 tsp. lemon zest.

Method

Discard tough leaves and woody base of lemongrass. Thinly slice the tender portion of the lemongrass stem. In the base of a steamer, combine lemongrass, orange juice, lime juice and ginger; bring to a boil. Arrange skate on steamer rack or basket, fit to pan, cover tightly. Reduce heat; steam for 5 minutes or just until skate "flakes" easily when tested with a fork. If rack will not hold all of the skate at one time, steam in two batches.

Using a wide slotted spatula, carefully transfer skate from the steamer rack to heatproof platter or individual serving plates; keep warm. Turn heat to high, cook juices, uncovered, for 10-15 minutes or until sauce is reduced by about one-half (should have consistency of syrup). Strain sauce over fish. Garnish with lime slices and chives or scallion tops. Serves 4.

Source: Chef Scott Melo, Grand Prize winner of the National Fisheries Institute Cook off Competition "New Tastes for a New Reality"

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