

New Wave of Research



Photo of Long Beach by Frank S. Buonaiuto

The awesome power of the Atlantic's waves pounding the beach can be experienced by beachcombers, surfers and scientists alike. **Frank S. Buonaiuto** (who is all three rolled into one) captured this image when March winds and the ocean worked to produce some perfect waves along Long Island's south shore. (To watch this 12-foot wave crash onto shore, go to the Web link listed on page 15.)

Buonaiuto, who has a dual appointment at Stony Brook and Hunter College, along with colleagues **Brian A. Colle**, **Robert E. Wilson**, **Malcolm J. Bowman** and **Charles N. Flagg** at the Marine Sciences Research Center (MSRC) at Stony Brook University, will be applying a state-of-the-art wave model to the New York metropolitan region including the Atlantic Coast, Long Island Sound and Great South Bay.

The model will provide more accurate descriptions of nearshore wave fields which can be used by the National Weather Service, emergency managers for municipalities, and both recreational and commercial

boaters to better forecast "severe sea-states" and erosion hazards. The wave model will also be used to improve accuracy of storm surge predictions for New York City and Long Island as well as enable lifeguard associations to anticipate days with severe rip current activity.

This project, **Modeling of Nearshore Wave Characteristics for the New York Metropolitan Region**, is one of many new research projects to be funded by New York Sea Grant in 2006.

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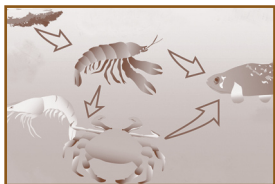
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From the Director

For five days in September 2005, New York Sea Grant hosted a review panel of outside experts known as a Program Assessment Team or "PAT" that was appointed by the National Sea Grant Office. The team's review focused on all aspects of NYSG's program, but heavily weighted success in terms of how well we produced significant results. Their criteria included evaluating NYSG's significant contributions to science and technology, education, and outreach as well as the program's impacts on society, the economy and the environment.

The PAT rated NYSG's program on 14 areas of performance within four major criteria. And the review results? The team awarded NYSG the highest possible rating (*Highest Performance*) on 12 of the 14 areas and the next highest rating (*Exceeds Benchmark*) on the remaining two.

With such good news to share, NYSG's management and staff wish to thank all

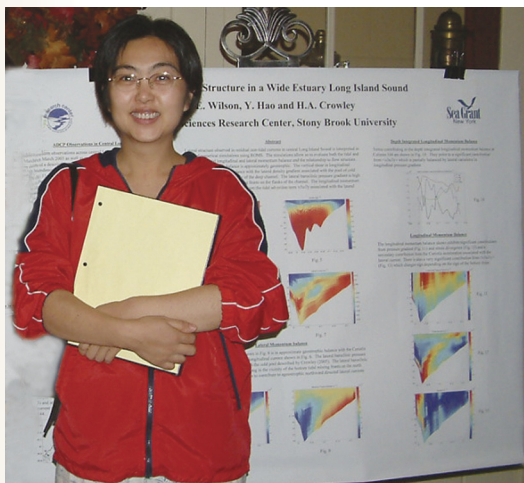
of the stakeholders and collaborators who contributed to this excellent result, especially to more than 80 who met with the PAT directly. These included our Board of Governors and Program Advisory Council, administrators from Stony Brook and Cornell Universities, the Chancellor of the State University of New York, and business, industry, agency, legislative, environmental action and research community representatives. Many others indirectly contributed via appearances in materials distributed to the PAT before and during the review. NYSG staff prepared high quality briefing materials and made excellent presentations, but without the testimonials of the stakeholders, the ratings would not have been nearly as high.

We thank all of you who participated in such a positive review of our past successes and invite you to read ahead to find out what's in store for the future.

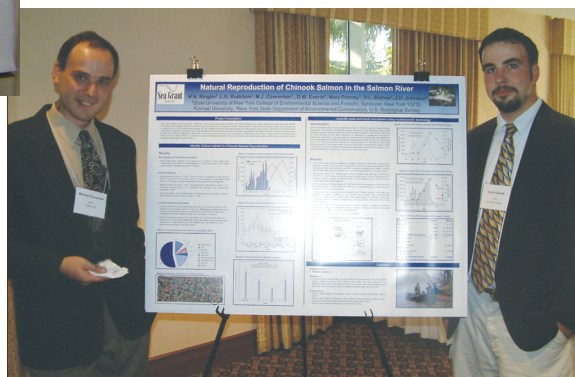


Students get a well-deserved "pat" on the back during NYSG's program assessment in September 2005.

Sea Grant Scholar Yan Hao presented research on the Long Island Sound estuary headed up by Robert Wilson of the Marine Sciences Research Center, Stony Brook University.
Photo by Barbara Branca



Post-doc Michael Connerton (l.) and Scholar Dustin Everitt present their work on salmon fisheries done under Neil Ringler of SUNY College of Environmental Science and Forestry.
Photo by Lane Smith

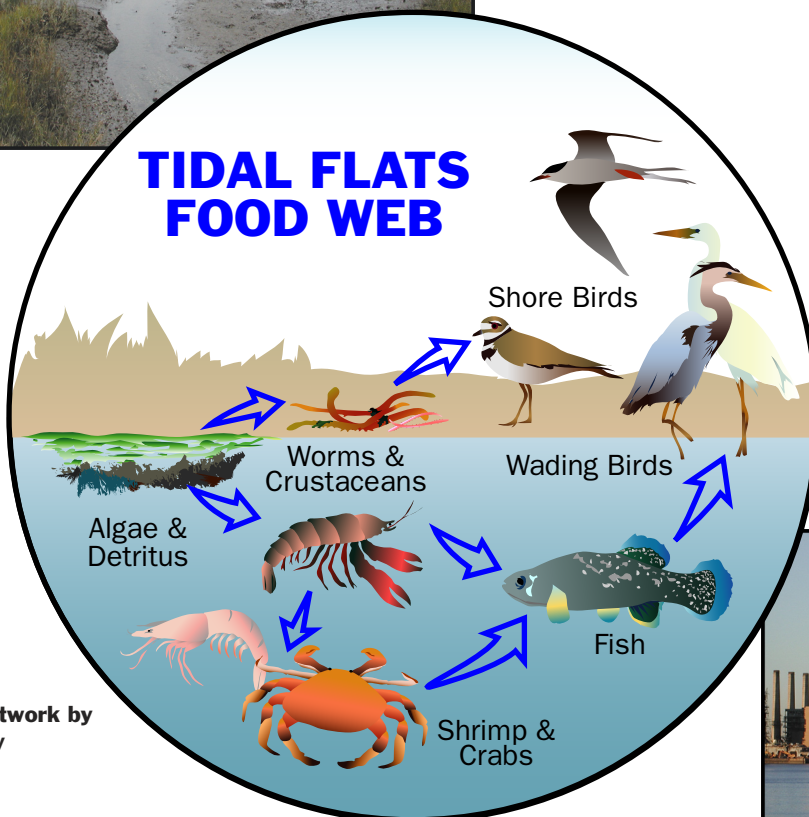


New Wave of Research: Choosing with Rigor

High standards in scientific quality and usability continue to drive the selection of NYSG's core research portfolio. Fifteen new projects began their valuable work February 2006 with more than \$1 million from NYSG's budget. They are an elite group that started in a pool of nearly 60 competitive preproposals responding to topics identified in NYSG's Strategic Plan. Importance to New York was weighed by NYSG staff and its 24-member Program Advisory Council, and rigorous technical review of invited full proposals was provided by more than 90 peer experts from out-of-state universities and institutions. The 2006 projects' objectives are slated for completion in one year, but NYSG will return to allowing two-year durations in 2007-2008.



For Wallace's project, samples will be taken from this creek on Staten Island's eastern shore.



Food web artwork by
Loriann Cody

Other samples will come from creeks near
the busy Arthur Kill.
Photos courtesy of William Wallace

“

Each of these projects has audiences eager for the results. It's exciting and we look forward to maximizing the information flow.”

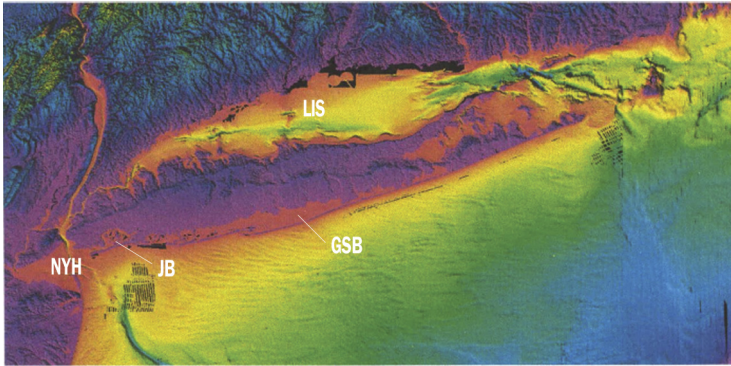
— **Cornelia Schlenk**

The Importance of Metal Storage in Prey and Digestion in Predators to Metal Trophic Transfer in Estuarine Food Chains

The marine ecosystems of New York City's Staten Island vary from the fairly park-like creeks and tidal flats of the eastern shore to the banks of the industrial, urban Arthur Kill. In this project, **William G. Wallace** of the Biology Department and Center for Environmental Science, College of Staten Island, CUNY, will investigate how heavy metals like cadmium and mercury are transferred up the food chain. His team will examine and attempt to analyze and predict metal trophic transfer from prey organisms such as worms to higher trophic-level benthic predators such as fish. They will consider how certain prey organisms partition and store metals within their tissues and how this affects how the metal is transferred to their predators. Project results from various locations around Staten Island will help resource managers highlight toxicological consequences to predators feeding at contaminated sites and facilitate the modeling of metal body burdens in predators inhabiting impacted coastal environments.



New Wave of Research



Buonaiuto's wave model project will use high resolution maps that indicate the depth of New York Harbor (NYH), Long Island Sound (LIS), and Great South Bay (GSB) by color. Cochran and Bokuniewicz will investigate submarine groundwater discharge in Jamaica Bay (JB). Map courtesy of Roger Flood

Submarine Groundwater Discharge into Jamaica Bay, New York: Fluxes of Water and Contaminants into the Bay

J. Kirk Cochran and **Henry Bokuniewicz** of MSRC, Stony Brook University will investigate submarine groundwater discharge (SGD) in Jamaica Bay. With results from this project, management decisions about water quality based on budgets of nutrients and contaminants to Jamaica Bay will know whether to factor in submarine groundwater discharge as a possible significant source of these chemical species to the Bay.

Genetic Make-up of *Fallopia* Plant Species Invading Novel Coastal Habitats

Massimo Pigliucci and **Christina Richards** of Stony Brook University's Department of Ecology and Evolution seek to determine the genetic make-up and degree of hybridization of the highly invasive *Fallopia* species of plants (commonly known as knotweed) on Long Island. In its native Japan, knotweed (*Fallopia japonica*) has been known to colonize the bare volcanic slopes of Mt. Fuji. But since knotweed's introduction to North America, the plant has become an invasive, overtaking native plants in salt marshes sometimes growing side by side with another familiar invader—*Phragmites*. How does knotweed survive and spread in habitats that are far more saline than its native habitat? The researchers posit that perhaps hybridization occurring between

F. japonica and its less invasive relative, *F. sachalinensis*, has produced plants successful in populating open beaches, salt marshes, as well as brackish and fresh water riparian areas. Project results about the genetic make up and differences of Long Island's *Fallopia* populations from European and Japanese populations along with how hybridization and selection impact the degree of invasiveness into novel habitats will help managers to predict and prevent the spread of these plants into our important coastal habitats.



Invasive *Fallopia* (left) alongside invasive *Phragmites* (right) on Long Island's south shore. Photo by Christina Richards



Greg Boyer (r.) testing for cyanobacterial toxin. Photo courtesy of Greg Boyer

Deployment of an Automated System for the Detection of Cyanobacteria

Gregory Boyer of SUNY College of Environmental Science and Forestry's (CESF) Department of Chemistry will develop an automated and instantaneous monitoring system for cyanobacterial blooms and cyanobacterial toxins in Lake Ontario. This system will be coupled with a hydrodynamic and algal growth model that will allow managers to make informed decisions about water usage, recreational contact and human exposure. National and international water resource managers will be able to assess real-time data sets to best protect against drinking water toxin contamination. The proposed optical monitoring systems can readily be incorporated into other autonomous monitoring systems located across New York State and around the country.



Bassem Allam at the Marine Pathology Lab, Stony Brook University. Photo by Paul C. Focazio

Development and Application of a Quantitative PCR Technique to Establish QPX Dynamics in Clams and in the Environment

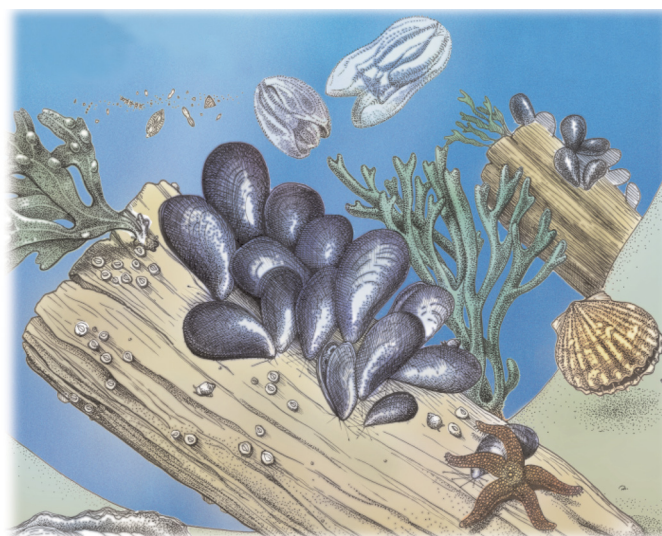
Bassem Allam and **Jackie Lynne Collier** of MSRC, Stony Brook University, will develop a quantitative real-time polymerase chain reaction (PCR) technique for research and diagnosis of the QPX organism, a pathogen that has negatively affected clam populations in New York's waters. The PCR technique will not only provide an alternate monitoring tool for QPX in hard clams, but will also open a door to investigating the abundance and dynamics of QPX in the environment which is essential for a better understanding of QPX biology and ecology. The relationship between QPX abundance in the environment and its presence and abundance in clam tissues will provide necessary information concerning QPX transmissibility and may lead to better prediction of disease outbreaks. All of these pieces of information will assist natural resource managers and aquaculturists to better manage wild and cultured clam populations in order to avoid QPX disease development and spread.

Evaluation of Environmental and Biological Factors which Promote Toxic Cyanobacteria Blooms in New York's Great Lakes

Christopher J. Gobler of Stony Brook University's MSRC, will utilize molecular, ecological, and chemical techniques to understand how both environmental stressors and food web interactions may act singularly, or in unison, to promote growth and toxin production by cyanobacteria in New York's Great Lakes. As a result of this research, water and resource managers will have a baseline explanation for bloom occurrence within each major lake system. This information will help managers design a plan to minimize the impact and occurrences of cyanobacterial blooms in the Great Lakes.

Impact of Predation by the Ctenophore *Mnemiopsis leidyi* on Larval Mortality of *Mercenaria mercenaria*

Can a squishy little critter no bigger than a grape increase the mortality of Long Island's hard clams? It can if that critter is a comb jelly that voraciously eats the larvae of one of NY's most economically-important bivalves. In this project, **Darcy Lonsdale** and **Robert Cerrato** of Stony Brook's MSRC will determine if predation by *Mnemiopsis leidyi* is a significant cause of mortality for the planktonic larvae of the hard clam, *Mercenaria mercenaria* in Long Island embayments in Great South Bay and Peconic Bay. With their results, resource managers and hard clam aquaculturists will be better able to assess shellfish recruitment in Long Island's bays and have an estimate of ctenophore prey selectivity, the rates at which ctenophores ingest bivalve larvae, and the subsequent mortality rates of bivalves.



Mnemiopsis leidyi, shown in the top center of the illustration, is a ctenophore (Greek for "comb-bearer"), a jellyfish-like animal smaller than a grape. Also known as comb jellies, these zooplankton sport bands of undulating cilia that can act as oars to row them through the water as they consume a diet of bivalve larvae.

Artwork by Jan Porinchak

A New Wave

Continued from page 5

The Lake Ontario Pelagic Foodweb: A Modeling Synthesis of Salmonine Recruitment and Prey-Fish Population Dynamics

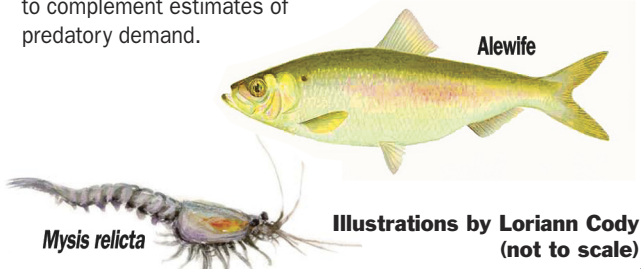
Neil H. Ringler and **Donald J. Stewart** of SUNY CESF along with **Robert O’Gorman** of the USGS Lake Ontario Biological Station will synthesize data from several sources that are responsible for Lake Ontario research and management and update an existing lake-wide predator/prey model. The team will also generate new data and synthesize existing information on wild production of salmonines from Lake Ontario tributaries. The project results will give fisheries scientists and managers updated information on predator/prey dynamics in Lake Ontario along with updates about wild recruitment. The resulting updated models will be useful tools for assessing the outcomes of changing climate and for managing stocking levels.



Coho salmon in spawning phase by Peter C. Thompson

Effects of Changing Light Levels on Alewife-Mysid Interactions in Lake Ontario

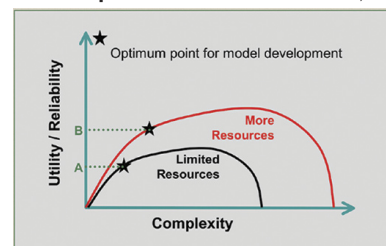
Lars G. Rudstam, **Edward L. Mills** and **Ellis R. Loew** of Cornell will investigate the effect of light on the interaction between an important forage fish, the alewife, and the invertebrate *Mysis relicta* through physiological measurements, laboratory experiments, and field observations. The expected outcome is to have a better understanding of alewife production in a changing Lake Ontario ecosystem. The results will provide managers with information about prey abundance to complement estimates of predatory demand.



Illustrations by Loriann Cody (not to scale)

The Development and Use of Predictive Models in Great Lakes Decision-Making: An Interdisciplinary Synthesis

In order to provide a synthesis of practices associated with the use of models in support of New York Great Lakes management decisions, **Jack Manno** and **Richard Smardon** of the Department of Environmental Studies at SUNY College of Environmental Studies and Forestry (CESF) team up with **Joseph V. DePinto** of Limno-Tech, Inc. and the



University of Michigan in Ann Arbor. The expected outcome of their project is

to improve modeling efforts and the decision-making process and interaction between the two and provide criteria to assess whether or not modeling/decision-making interaction is improving the quality of policy deliberations and Great Lakes decisions.

Graph courtesy of Joseph DePinto

of Research

Acoustics Unpacked: Analysis of the Combined Error Structure in Acoustic Surveys in the Great Lakes

Patrick J. Sullivan and **Lars G. Rudstam** of Cornell's Department of Natural Resources will provide a synthesis of acoustic methods of surveying fish population for all three of New York's large lakes—Erie, Ontario and Champlain—into a form that is portable and general to almost any aquatic system. The expected outcome will be a tool that integrates all the steps in deriving calculations of forage abundance and distribution in a unified way to obtain acoustic survey estimates that reflect the real precision in abundance estimates.

The Potential of the Ribbed Mussel *Geukensia demissa* in Regulating Toxic and Small-Form Phytoplankton in Coastal Ecosystems

Robert Cerrato and **Darcy Lonsdale** of the Marine Sciences Research Center, Stony Brook University, will examine the potential of the ribbed mussel *Geukensia demissa* in regulating blooms of toxic algae and in regulating small-form phytoplankton that are inefficiently filtered by many other suspension-feeding bivalves such as clams. The results of this research will help provide resource managers with a new option to help improve general water quality, the quality of food for other shellfish and possibly provide a new brown tide mitigation strategy.



Ribbed mussel *Geukensia demissa*
by Jan Porinchak

Dynamic Simulation of the Transport of Contaminants in the Waterways of Metropolitan New York Under Extreme Conditions

In this new project, the Stony Brook Storm Surge research team will investigate the potential consequences to water quality of the New York Harbor area if storm surge barriers were deployed to protect the Metropolitan New York region from catastrophic flooding during extreme storm events. The team members—**Malcolm J. Bowman**, **Robert E. Wilson**, **Roger D. Flood**, **Brian A. Colle**, and **Douglas Hill** of MSRC at Stony Brook University and **Frank S. Buonaiuto** of both MSRC and Hunter College—will produce a model system (Stony Brook Storm Surge Version II model) that can help evaluate the impacts on water quality from the use of storm surge barriers located at the Narrows, Perth Amboy, New Jersey and the East River.

For a refresher about an earlier project by the Stony Brook Storm Surge research team, read the Spring 2005 cover article by Lane Smith entitled "Closing the Door on Storm Surges."

Garry Dole was on hand to provide assistance to teachers Dan Lawrence, Jennifer Neri and Greg Lauer during the workshop.



“Invaders” in the Classroom

How do you get students interested in learning about round gobies, ruffe and sea lamprey? You call in the “law” in the form of characters like Detective ID or Detective Ecofriend to help students in grades 4-10 who want to help book “invaders” for their crimes against the environment.

Nab the Aquatic Invader! Be a Sea Grant Super Sleuth is a new educational Web site created by several Great Lakes Sea Grant programs that provides the latest information about aquatic invasive species (AIS) through colorful characters and a crime-solving theme. The idea for the Web site was originally conceived by **Robin Goettel** of Illinois-Indiana Sea Grant and **Helen Domske** of New York Sea Grant. The student-friendly pages were developed into a useful learning tool that now has the potential to reach students from the Great Lakes and coastal areas around the country.

“In creating this site, our goal was bridging the knowledge gap, connecting the abundant information available on AIS with teachers and students, and presenting it in an exciting and understandable way,” said Helen Domske, New York Sea Grant education specialist. The site is part of the *Sea Grant Nonindigenous Species Web* (SGNIS) site, which contains a wealth of AIS information.

Funding from the National Sea Grant College Program will allow for expansion of the site and provide a broader perspective by adding invasive species from waters beyond the Great Lakes. Sea Grant programs in Oregon, Connecticut, and Louisiana will be adding marine invaders to the

list of suspects. Sea Grant educators will also enhance the educational content and incorporate more teacher-tested activities and a community stewardship component

The Web site homepage (www.sgnis.org/kids) introduces student investigators to five detectives, each focused on specific aspects of AIS criminal cases. For example, Detective Ecofriend is an expert on the environmental effects of AIS, while Detective Dollars and Sense investigates the economic impacts of these invaders. Each character is a fun and colorful cartoon. Teachers are given a special spot on the Web site under *Top Desk Administrator* which offers links to resources such as curriculum, videos, CDs, fact sheets, books, maps, posters, and more!



Watch

Judy Maynard and Carolyn Kick check out the web site.
Photos by Helen Domske

The *Meet the Suspects* page illustrates the 10 Most Wanted, a variety of cartoon criminals, including Zeke “the Prowler” Zebra Mussel, Purple “Lucky” Loosestrife and Gabby “the Lowlife” Round Goby. Each suspect has been interrogated, and the transcripts provide student investigators with critical information for solving these cases. Crime solving involves taking part in quizzes, games, and other brain teasers that test the student investigator’s knowledge about invasive species and their impacts.

As part of the grant, on December 14, 2005, New York Sea Grant brought 23 teachers to the Erie 2 BOCES, Science Resources Center to learn about the Nab the Aquatic Invader Web site. **Garry Dole**, Science Resources Coordinator and teacher training specialist, provided computer set-ups for the teachers to use as they explored the site and came up with suggestions to improve the pages. Many of these teachers will help to create new activities for the Web site and serve as “Nab the Aquatic Invader” representatives who will share the site with other teachers at conferences and professional development programs and serve as mentors to train other teachers.

The responses to the Web site were very positive and many of the teachers commented on the look of the pages and the educational potential of the site. **Jennifer Neri**, from Fredonia Middle School, liked

the idea of the “Super Sleuth” and the colorful characters on the site. She was “excited to finally have a site for Invaders that is kid-friendly.”

Stacy Brand, of Washington Middle School in Jamestown, indicated that the site offered “good possibilities for special-needs learners and activities could be adapted and used with existing software programs to facilitate instruction.” She also stated that there was a “good tie-in with current 5th grade science existing curriculum that meets NYS standards.” Many of the teachers indicated that they would like to have sound added to the site and a roll-over glossary for more difficult terms. These comments and suggestions will go a long way to improving the Web site.

Although just in its developmental infancy, the initial Web site design has already won awards from the Association for Communications Excellence and NOAA Sea Grant, and thus has the potential of becoming a valuable education tool on invasive species. A community stewardship component will be incorporated to help students share their new-found knowledge on invasive species with other students and members of their communities.

New York Sea Grant welcomes comments from other educators and stakeholders who did not attend the workshop. After checking out the site, please feel free to email Helen Domske at (hmd4@cornell.edu) with your comments or suggestions. We invite you to bookmark the site on your computer to keep up with the exciting changes that the grant will bring and encourage youngsters to become Sea Grant Super Sleuths!

— **Helen Domske**



Seaweed—

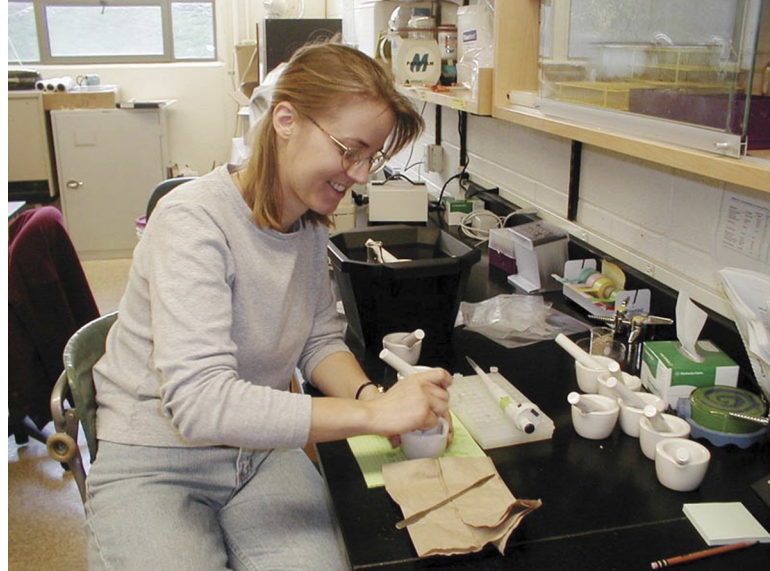
A Natural Bioremediator in Finfish Aquaculture

Can nori seaweed be paired up with marine fish in order to provide more environmentally-friendly and economically-sound aquaculture techniques? Researchers funded by New York and Connecticut Sea Grant programs think that this duo is a good match.

The nutrient enrichment of coastal environments has had significant negative ecological impacts including blooms of undesirable, even toxic algae and development of stressful oxygen-depleted bottom waters. One of many sources of coastal nutrient enrichment is the effluent from onshore aquaculture of marine fish. Although these facilities can provide a much needed boost to local economies, these aquaculture operations also deliver significant quantities of fertilizing nutrients into local coastal waters in flow-through systems. However, tank systems can be converted to the recirculating type if a means of removing excreted ammonium is provided. A possible method of achieving this is a polyculture system in which ammonium-absorbing seaweed tanks are inserted downstream from the fish tanks. Benefits of this integrated aquaculture system—seaweeds plus vertebrate animals—include the reduction in water-borne nutrients as they are absorbed by growing seaweed and the production of marketable seaweed products. The integration of seaweed production with land-based finfish farms can be both economically and ecologically attractive.



**Nori seaweed drying in the New Hampshire lab.
Photo courtesy of Christopher Neefus**



**Graduate student Jennifer Day grinds tissue samples for pigment analysis as part of Kraemer's project.
Photo courtesy of Robert Forsberg**

To obtain information on the growth, nutrient uptake and optimal growing conditions of native northeastern seaweed, the research team of **George Kraemer** of SUNY Purchase, **Charles Yarish** of University of Connecticut and **Christopher Neefus** of University of New Hampshire, conducted lab and mesocosm studies of abundant northeastern *Porphyra* species. The team examined such factors as the effects of irradiance, temperature, and nutrient concentration on the growth, photosynthesis, and nutrient uptake of four local species of *Porphyra* in laboratory culture and in greenhouse mesocosms. The scientists also set out to determine growth and effluent removal rates of *Porphyra* in 1000-liter mesocosms as a function of nutrient concentration, flow rate, culture density, and culture method. Ultimately they hoped to provide knowledge of the best conditions for growing seaweed in a recirculating polyculture system.

The results from this project have expanded what scientists know about the relationships between nutrient availability, temperature and uptake and tissue production in *Porphyra*. The research has also identified *P. amplissima* as a very strong performer in terms of rate of tissue production and, hence bioremediation. A large-scale test run indicates that *Porphyra* can remove ammonium from fish tank effluent to allow the operation of a recirculating system in which the fish remain healthy and growing. With the continued refinement of the system (engineering, operating conditions, etc.), the team predicts this system will make more profitable and ecologically benign those marine animal aquaculture businesses sited onshore.

In fact, the scientists found that for efficient nitrogen uptake, one square meter of nori will clean the wastewater from 10 kilograms of fish—that's equivalent to 22 seeded nori nets to clean the waste of one ton of fish.

Since this NYSG project was completed, other groups have begun using nori in aquaculture research and have fostered more partnering between academia and industry.

Using this project as a springboard, **Don Cheney** of Northeastern University began to look more closely at nori in a related MIT Sea Grant funded project. According to Cheney, “Kraemer’s team proved nori’s ability to take up nutrients. We’ve taken advantage of that to learn more about nori with a goal of finding a better replacement for commercial fish meal.”

Cheney’s team has discovered that the *Porphyra* species are very rich in fatty acids as well as protein needed for fish growth, and thus could be suitable as a replacement for current fish meal, which may contain PCBs and mercury. Nori would provide the added benefit of removing toxins from the tanks.

In a related project funded in part by the USDA, Cheney’s team is eyeing the ability of various seaweed species to tolerate and remove pollutants such as PCBs and PAHs from water. Working with a fish aquaculture facility in Massachusetts, the team is going to compare seaweed growth

rates with that of soybeans. Soybeans are a great source of protein, but lack the essential fatty acids that seaweed contains.

In a project that involves many Canadian governmental agencies, **Thierry Chopin** and his research partners at the University of New Brunswick are developing integrated polyculture growing mussels and *Laminaria* (kelp) in offshore salmon pens near the Bay of Fundy.

To move the new technology out of the laboratory and into the real world, demonstration integrated aquaculture/bioremediation facilities have been constructed at Great Bay Aquaculture, NH, and in Bridgeport, CT, at the regional aquaculture high school. If the use of seaweed for bioremediation catches on, it promises to enhance both the aquatic environment and healthy seafood supplies.

— **Lane Smith, NYSG Research Program Coordinator**
and **Peg Van Patten, Communications Director,**
CT Sea Grant and author of
Seaweeds of Long Island Sound

Fisheries Uncertainty Workshop

Approximately 40 people attended a Fisheries Uncertainties workshop in Syracuse organized and facilitated by NYSG Fisheries Specialist **Dave MacNeill**. Representatives of several agencies including New York State Department of Environmental Conservation (NYS DEC), US Geological Survey, Canadian Centre for Inland Waters/Department of Fisheries and Oceans (CCIW-DFO), Great Lakes Fishery Commission, Great Lakes Research Consortium as well as members of academia and interested stakeholders came to the fall ‘05 workshop funded by the New York Great Lakes Protection Fund. The purpose of the workshop, as its name implies, was to discuss the various factors and events that potentially impact future populations of economically important species of fish in New York’s Great Lakes. As someone who has observed Great Lakes fisheries over the last several decades, and has recently been nominated by NYS DEC to serve on the Great Lakes Fisheries Commission representing commercial fishing interests, MacNeill comments, “Nothing is more certain than uncertainty itself.”

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Nothing is more certain than uncertainty itself.

— **Dave MacNeill**

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Highlights of the agenda were presentations from three workshop speakers. **Evan Cooch** of Cornell University presented new modeling techniques using dynamic models developed by physicists. **Valerie Luzadis** of SUNY ESF spoke on ecological economic valuation, and **Cliff Scherer** (also of Cornell) gave a presentation on risk/uncertainty communication tools.

Based on completed attendee evaluations, the workshop was a success. Out of workshop discussions, some potential research topics emerged. Also, NYS DEC expressed keen interest in follow-up workshops that

will focus on decision analysis and risk communication planning that agencies can use with stakeholders.

Proceedings from the workshop are being developed into a final report as is a fact sheet. For more on the workshop or the report, contact Dave MacNeill at dbm4@cornell.edu.

— **Dave MacNeill,**
NYSG Fisheries Specialist

New CD a Boon to Nation's Byways



NYSG's Dave White, far right, facilitated three roundtable sessions that produced the ideas and inspiration for the financial sustainability CD.

Photo taken on Alexandria Bay courtesy of Kara Dunn

National Scenic Byways parallel New York's Great Lakes-St. Lawrence and Lake Champlain-Hudson River shorelines, the Great Lakes Seaway Trail and the Lakes-to-Locks Passage. The coastal economies along the Great Lakes Seaway Trail and Lakes-to-Locks Passage byways rely heavily on water-based recreation, tourism and small businesses. Promotion of the byways falls to two small non-profit organizations that face the question of how to secure sustainable funding. New York Sea Grant's Great Lakes Program and Seaway Trail, Inc. partnered to answer that question not only for New York's byway organizations, but for the non-profits nationwide that are developing and promoting the national collection of America's Byways.

The answer comes in the form of the new "Driving Financial Sustainability for America's Byways Organizations" CD. NYSG's **David G. White** facilitated three roundtable discussions organized by Seaway Trail, Inc. Executive Director **Teresa Mitchell**. The sessions gathered byway representatives from across the U.S. They met in Buffalo, Rochester and Alexandria Bay - all along New York's Great Lakes Seaway Trail shoreline. Those sessions produced the information, ideas and inspiration for developing "real-world" case profiles for the CD, designed by NYSG's **Molly Thompson**.

Mitchell and White debuted the CD at the 2005 National Scenic Byway Conference in Cleveland, Ohio.

The profiles on the CD are categorized by corporations and businesses, events, foundations, government and academic institutions, individuals, and products and services. The stories

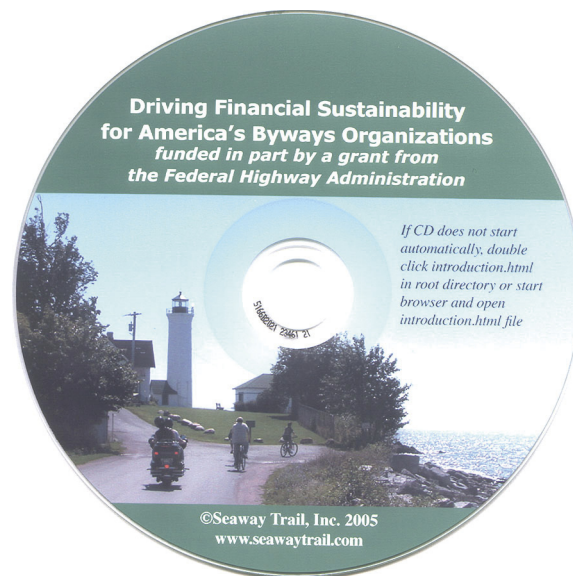
include successful publication advertising sales, an antique car road rally event, and Rural Philanthropy Day events that match regional organizations with representatives from foundations and other funders. The CD also includes measurement and tracking program models, a project advisors directory, and a resources list with more than 2,200 links.

Janet Kennedy, executive director of the Lakes-to-Locks Passage byway organization, says, "This CD has provided a terrific resource that we have already begun to utilize with our Byway's non-profits to address the financial needs for organizational capacity and service to the byway communities."

White says, "This project was an excellent way to help byway organizations across the country understand how they can broaden their potential for financially sustaining themselves, and it showcased the successes that New York's Seaway Trail, Inc. has built over its 26 years as a byway leader."

Seaway Trail, Inc. Executive Director Teresa Mitchell notes that the CD "is not only valuable to the non-profit organizations promoting America's Byways, but can be used by any type of non-profit." Seaway Trail, Inc. received a Federal Highway Administration grant for this project. The CD is accessible online at www.seawaytrail.com.

— **Kara Dunn**



Estuary LIVE! 2005:

Students across the country visit New York Harbor during a live virtual field trip

Rich and full of life, estuaries are vital connections between the land and the ocean. Students often learn about these fertile and productive habitats, but many do not have the opportunity to explore an estuary first-hand. Although these mixing zones for fresh and salt water share certain features, each estuary's ecosystem has a unique set of characteristics.

With these factors in mind, Sea Grant programs in New York and New Jersey teamed up to design and host a live Web-based field trip in New York – New Jersey Harbor, one of the nation's most densely populated urban estuaries. On September 22, 2005, classrooms across the country connected to the Internet for an hour-long virtual excursion to Caven Point Beach in Jersey City, NJ. A stretch of un-hardened shoreline in the heart of the metropolitan region, the beach provided direct access to the water and a panoramic view of the lower Manhattan skyline, Statue of Liberty and Upper New York Bay.

This interactive Webcast was part of Estuary Live, a national tour of five estuaries sponsored by the National Oceanic and Atmospheric Administration and the Environmental Protection Agency. The goal of the broadcast from the Harbor Estuary was to increase students' awareness and understanding of urban estuaries, giving them the knowledge they need to become good stewards of estuarine resources. At least 20 scientists, educators and managers contributed to the program by leading field stations, answering questions and providing behind-the-scenes logistical support.



After finding a 6-pack ring on the beach, this student from Manhattan's Humanities Preparatory Academy explained to EstuaryLive viewers the potential negative impact that floatable debris can have in our coastal waters.

Two classes from NY and NJ participated onsite during the program: 8th grade students from Explore 2000, a Hudson County School of Technology in Jersey City, and 9th-12th grade students from Humanities Preparatory Academy in Manhattan. These students conducted hands-on investigations by dragging a seine net to collect aquatic organisms; tested water samples for salinity, temperature and dissolved oxygen levels; built models to demonstrate the functions of coastal marshes; and combed the beach for natural and man-made objects.

As the local students described their field studies, internet viewers e-mailed questions directly to the experts on the beach. Although there was not time to answer the hundreds of questions submitted, many long-distance viewers received on-air responses within minutes. In total, more than 500 classrooms registered to view Estuary Live—58 of these from New York City—representing approximately 11,000 students nationwide.

Additional resources for teachers and students, including answers to many of the questions asked during the broadcast, will be made available on www.harborestuary.org this spring. The full broadcast can now be viewed at www.estuaries.gov.

**— Laura Bartovics
Outreach Coordinator,
NY/NJ Harbor Estuary Program**

NYSG's HEP Outreach Coordinator Laura Bartovics hosted the Estuary Live broadcast, beginning with an introduction to the hour-long virtual tour.

Photos courtesy of the NY-NJ HEP

CURRENTS

New Wave of Research continued from page 7

Effect of LIS Environmental Stressors on Defense Against Disease in the American Lobster, *Homarus americanus*

With this new project, **Jan R. Factor** of the Division of Natural Science, SUNY College at Purchase, aims to determine the physiological impact of environmental stress on the immune system of the American lobster. Using *in vivo* laboratory techniques, Factor will measure the impacts of sublethal exposure to the environmental stresses of high temperature and reduced oxygen on *Homarus americanus*. Results from the project are expected to provide information for managers, agencies, and the public that will help explain the physiological basis for

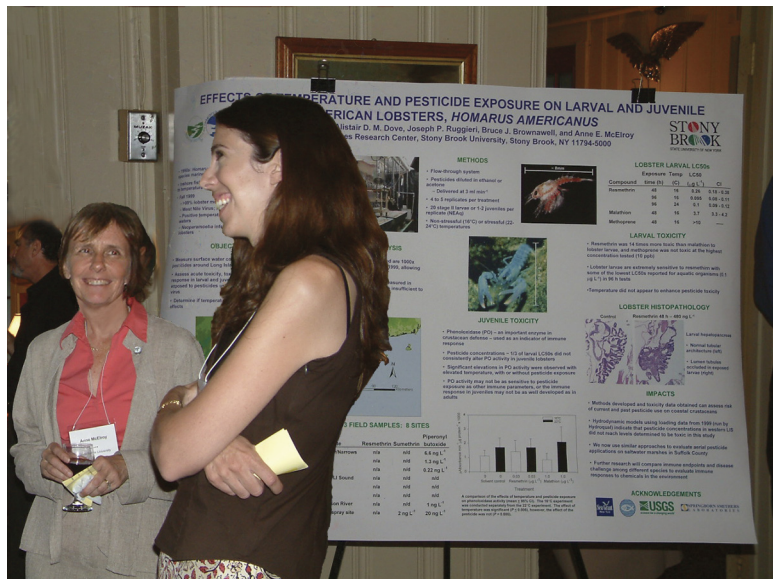
the Long Island Sound lobster mortalities by determining the mechanism of impact on the immune system. The research will also provide additional evidence and insight about the role of natural environmental stress and climate change on the health of LIS lobsters and the long-term prospects for the LIS lobster fishery.

Barbara A. Branca, Patrick Dooley, Cornelia Schlenk and Lane Smith contributed to this multi-page article on new research.

Lobster Research Findings Appear in Shellfish Journal

The October 2005 issue of the *Journal of Shellfish Research* is dedicated to research on lobster health. It is a compilation of research that investigates *Homarus americanus* health with an emphasis on the factors that affect populations in Long Island Sound. The majority of the research presented was conducted as part of a regional collaboration between NOAA Fisheries, NOAA Sea Grant National Office, CT Department of Environmental Protection, NYS Department of Environmental Conservation, CT Sea Grant, NY Sea Grant, and US EPA.

Among the 25 articles included in the issue are: a synthesis of research findings written by **Jack Pearce** and **Nancy Balcom** (the latter of CTSG), an article by Jan Factor (whose new project is described above) and his team, as well as an article by **Anne McElroy** and **Ann Zulkowsky** (pictured left) and their collaborators. Guest editors of October JSR issue were **Anthony Calabrese**, NYSG's **Antoinette Clemetson**, and CTSG's Balcom. To order this issue, see page 15.



Associate professor Ann McElroy (left) and Sea Grant Scholar Ann Zulkowsky (right) presented their lobster research during NYSG's program assessment in September 2005. Their work on the toxicity of pesticides on larval and juvenile lobsters was conducted at Stony Brook University's Marine Sciences Research Center.

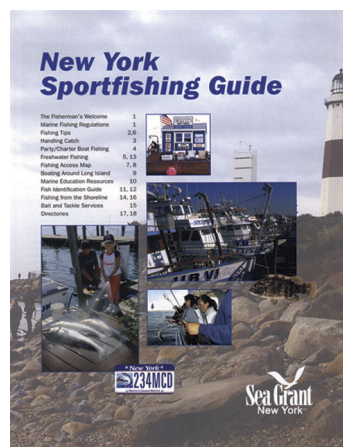
Photo by Barbara A. Branca

— Antoinette Clemetson and
Barbara A. Branca



Warm up to nyseagrant.org this Winter...

- Learn more on NYC and Long Island's fresh and saltwater resources through fishing via a newly-launched Web site for our I FISH NY outreach program
- Read up on a new suite of educational efforts that NY and six other Sea Grant programs will fund thanks to a \$2.5 million award for Great Lakes and Ocean Sciences Education
- Learn more about NYSG's "New Wave of Research" and experience the waves breaking along Long Island's south shore



New York Sportfishing Guide.

New York Sea Grant, *The Fisherman*® and *Surf Side 30 Marina*. 2005. Pub ID# 2883 A 19-page guide for Long Islanders and visitors includes a colorful fish ID guide, catch and release techniques, sportfishing regulations, angler ethics, and directories of LI bait and tackle shops, charter boat companies, and boat launch facilities. FREE at LI visitor center kiosks.

LastWave

Sea Grant Publications

QPX Disease in Hard Clams: Quahog Parasite Unknown. NY Sea Grant. 2003. Pub ID# 2235 Free

Journal Reprints

A comparison of rippled scour depressions identified with multibeam sonar: Evidence of sediment transport in inner shelf environments. V.L. Ferrini, R.D Flood. 2005. *Continental Shelf Research* 25: 1979-1995. Pub ID# 2688 Free

A method for assessing removal of foreign particles from the blood by fixed phagocytes of the American lobster, *Homarus americanus*. J.R. Factor, K. Orban, D.H. Szarowski, G. Lin, T. Larocca, A. Becker and K. Jacoff-Kapusta. 2005. *Journal of Shellfish Research* 24(3) 713-717. Pub ID# 2918 Free

A review of the causes, effects, and potential management of harmful brown tide blooms caused by *Aureococcus anophagefferens* (Hargraves et Sieburth). C.J. Gobler, D.J. Lonsdale, and G.L. Boyer. 2005. *Estuaries* 28(5): 726-749. Pub ID# 2787 Free

Contributions to the Long Island Sound Lobster Research Initiative. A. Calabrese, N. Balcom and A. Clemetson (guest editors). 2005. *Journal of Shellfish Research* 24:3 687-875. Pub ID# 2928 See description on page 14. \$35

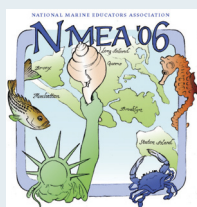
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ATTENTION EDUCATORS!!!

New York State Marine Education Association (NYSMEA) presents the National Marine Educators Association 2006 Annual Conference July 15th to July 22nd 2006 co-sponsored by NYSG. For complete conference information, check the website at: www.NYSMEA.org

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Fish and Heart Health

Long around this time of year when the short days of winter start getting longer, people begin thinking of Valentine's Day, traditionally celebrated with heart-shaped valentines. Since 1963, the President of the United States issues an annual proclamation designating February as "American Heart Month."

Coastlines asked Dr. David L. Brown, the Co-Director of Stony Brook Heart Center and Chief of the Division of Cardiovascular Medicine at Stony Brook University Hospital School of Medicine to make that link between eating fish for heart health.

"Eating fish with high amounts of omega-3 fatty acids such as mackerel, sardines, tuna and salmon at least twice a week prevents heart attacks and strokes by reducing inflammation in the arteries and inhibiting the clotting of blood," says Dr. Brown. "These types of fish should be part of every adult American diet," he continues.

Individuals who would like more information about eating seafood including current government advice on mercury in some seafood products, can visit the FDA's Web site at www.cfsan.fda.gov/~dms/admehg3.html. Additional information is also available at the NY Seafood Council Web site at www.nyseafood.org/news.asp.

*Bringing
Science to
the Shore*

Tuna with Sesame Crust and Balsamic Glaze

Ingredients

4 tbsp. balsamic vinegar
2 green onions (white and light-green part)
finely chopped
2 tbsp. coarsely grated ginger
1 1/2 lbs. thick tuna steak
4 tbsp. sesame seeds
1 tbsp. oil

Method

Mix vinegar and 2 tbsp. water with green onion and ginger in a bowl. Place tuna in the mixture and marinate about an hour. To cook, remove tuna from marinade; set marinade aside. Press sesame seeds into both sides of tuna. Heat nonstick pan to medium and add oil. Quickly sear tuna on both sides, just a couple of minutes — seeds brown quickly. Remove tuna from pan, pour in reserved marinade, and bring to a boil. Pour over tuna and serve.

Yield: 4 servings.

*Note: Tuna will be very rare. For better done, cook it without sesame seeds and sprinkle them over the tuna after cooking. One of Dr. David Brown's favorite recipes, "Tuna with Sesame Crust and Balsamic Glaze," written by Marian Burros, has been reproduced here from the **New York Times** with permission.*



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