Inside:
Sustainability Science and New Jersey's Urban Estuaries, Lessons From Japan........pg 2
Coast Day NJ.....................pg 7
NJMSC Hosts Conference for Gifted Students........pg 10
Coastal Calendar

Mark your new calendar for any or all of the coastal-related and nature-based events and special programs listed below. **NJMSC events are indicated by bold-faced type.** For a more comprehensive list of events and activities, log on to the State of New Jersey web site at [www.state.nj.us](http://www.state.nj.us) and look for the Travel and Tourism link on the home page.

**JANUARY**

**January 1, 2003**  
**First Day at the Beach**  
Celebrate the new year at the Ocean City Music, Boardwalk & Moorlyn Ter. at 1 p.m. Includes a run, entertainment & a dip in the ocean. For more information call (609) 525-9300.

**January 1-February 28, 2003**  
**Camden City Days**  
Residents of Camden City can visit the NJ State Aquarium for free when they show proof of their residency. NJ State Aquarium, 1 Riverside Drive, Camden. Visit [www.njaquarium.org](http://www.njaquarium.org) or call (856) 365-3300 for more details.

**January 9-12, 2003**  
**Atlantic Sail EXPO**  
The premier winter all-sailboat expo on the East Coast. Over 100 boats with hardware, gear, and accessories, plus more than 150 seminars about sailing from beginner to expert. New Atlantic City Convention Center, One Ocean Way, Atlantic City. Visit [www.sailamerica.com](http://www.sailamerica.com) for details.

**FEBRUARY**

**February 20-23**  
**Flower, Garden, and Outdoor Living Show of New Jersey**  
The Convention Center will be transformed with thousands of blooming plants and flowers nestled in the many large display gardens. The theme is “The Wonders of New Jersey.” Each garden will be individually themed to reflect the diversity of landscaping options in the Garden State. Seminars, demonstrations, and how-tos will be offered. NJ Convention & Expo Center, 97 Sunfield Avenue, Edison. Go to [www.macevents.com](http://www.macevents.com) for more information.

**February 23, 2003**  
**The 2003 Deep Cut Orchid Show**  

**February 23, 2003**  
**Polar Bear Plunge**  
Polar Bear Plunge benefits the Special Olympics. Jenkinson’s Pavilion, Parkway and Ocean Avenue in Point Pleasant Beach. Call (732) 892-0600 for more information or visit [www.jenkinsons.com](http://www.jenkinsons.com).

continued inside back cover

On the Cover:  
The photograph on this issue’s cover was taken by Joseph Paduano of Long Branch, NJ. Joseph, a professional photographer, instructor and author who favors old homes, beach scenes and landscapes as subjects, has generously provided cover photographs for the past several issues of the Jersey Shoreline. The interplay of sunlight and shadows is characteristic of his work, evoking a soft dreamlike feeling.  
His photographs are in the collections of the Monmouth County Park System, The Port Authority of New York/New Jersey, Price Waterhouse, The State of New Jersey and Johnson and Johnson. His work has been published in New Jersey Monthly Magazine, Compass, Modern Photography and Business Journal of New Jersey and featured in a number of one-person shows and exhibits throughout New Jersey and in Manhattan’s Soho Gallery.  
Publications include a calendar (Images of the Jersey Shore) and several books, including Seascapes: A Photographic Essay.  
For more information about Joseph Paduano and his work, visit [http://members.aol.com/joepaduano/infrared/](http://members.aol.com/joepaduano/infrared/) or email joepaduano@aol.com
The Jersey Shoreline is a special publication of the New Jersey Sea Grant College Program and the New Jersey Sea Grant Extension Program published in cooperation with the New Jersey Marine Sciences Consortium.

The New Jersey Sea Grant College Program is managed by the New Jersey Marine Sciences Consortium. New Jersey Sea Grant is a statewide program that promotes greater knowledge and stewardship of our marine resources. It is part of the National Sea Grant College program, which includes 30 state programs. Support for the New Jersey Sea Grant College Program is provided by National Sea Grant, the State of New Jersey and participating universities, agencies and businesses.

Editor
Kim Kosko

Assistant Editor
Marsha Samuel

Designed by
Judy Ricketts-White

Subscriptions through donation to the Jersey Shoreline are currently available. See special return card insert. Change of address, subscription information and other questions should be directed to:
New Jersey Sea Grant Communications
Bldg. #22, Sandy Hook Field Station,
Fort Hancock, NJ 07732
Telephone 732-872-1300 ext. 18
FAX 732-291-4483
Email: kkosko@njmsc.org
World Wide Web address: http://www.njmsc.org

This publication was supported by the National Sea Grant College Program of the U.S. Department of Commerce's National Oceanic and Atmospheric Administration under NOAA Grant # NA76-RG0091. The views expressed herein do not necessarily reflect the views of any of those organizations. NJSG-02-506

TABLE OF CONTENTS

Sustainability Science and New Jersey's Urban Estuaries, Lessons From Japan .................................................. 2

“Phrag-mentor” Lorrie Gross Fuses Art, Culture and a Common Reed........................................................................ 5

Coast Day NJ.......................................................................................................................... 7

Coast Day NJ Attracts Record Crowd....................................................... 8

Signs Point to Watershed Stewardship............................................................. 9

NJMSC Hosts Family Academic Conference for Hundreds of Gifted Students..................................................... 10

Chance Conversation Plants the Seed for NJ Sea Grant Research Project ......................................................... 12

Rowan With the Tide When it Comes to Marine Biology and Environmental Studies ........................................ 15

Photo Credits: Lessons from Japan: Mike Weinstein; Phrag-mentor Lorrie Gross: Lorrie Gross, Kim Kosko; Coast Day NJ: Al Campbell, Kim Kosko, Marsha Samuel, NJMSC Hosts Gifted Students: Raquel Cuhno; Chance Conversation: Louise Wooton; Rowan With the Tide: Courtesy Richmond
This summer, I participated in the 3rd Coastal Environmental Science & Technology (CEST) Panel in Tokyo as a member of the American delegation to the United States-Japan Cooperative Program in Natural Resources. The US group was lead by Margaret Davidson, Esq., Acting Assistant Administrator for Ocean Services and Coastal Zone Management. Yokosuka, the Japanese port city, and the Port and Airport Research Institute (PARI), hosted the event, and a combined audience of nearly 100 listened to introductory presentations by invited speakers, followed by their formal technical papers on the second day.

Special remarks were offered by distinguished guests including representatives from the US Embassy and the Japan Ministries of Land, Infrastructure and Transport, and Education, Culture, Sports, Science and Technology. Dr. Shiro Ishii, Council for Science and Technology, delivered the keynote address, The Concept of Eco-Harmonious River Basin and Urban Restoration.
Initiatives. The workshop was followed by a vessel tour of Tokyo Bay, and an evening stay at a downtown Tokyo hotel.

CEST provides a key forum for interdisciplinary examination of coastal issues and serves as a link between natural and social scientists and policy makers. An important goal of the program was to present not only highly specialized technical research, but to also serve as a venue for interdisciplinary discussion and exchange of information to enhance capacity for integrated coastal management.

This was my first visit to Japan, and I was enthralled by the technological capacity and advancement of Japanese society, and the industriousness, work ethic and ingenuity of its people. But at the same time, I was dismayed at the parallels in Japan and our own state, at what a fully “built” coastal environment might portend for New Jersey. Japan is densely populated with an average of 873 individuals per square mile, but this figure is less than New Jersey’s average of 1135 individuals per mile. Moreover, urban centers in Japan and New Jersey are roughly equally populated; e.g., the two most densely populated wards in Tokyo, Nakano-ku and Toshima-ku, have 50,972 and 49,061 individuals per mile, respectively, while Guttenberg Town and Union City, both in Hudson County have 56,012 and 52,978 individuals per mile, respectively. With nearly 130,000,000 people living on a land area about the size of California, Japan’s populace is constrained to only about 24% of its total land area because mountainous terrain (68%) and agriculture (8%) occupy areas unsuitable for human habitation. My impression was, and I believe the data suggest, that Japan’s dependence on imports (including food, building materials and other natural resources) dictates a somewhat less than sustainable situation. Land is at such a premium that the Japanese must invest heavily in reclaiming land that was previously at the bottom of Tokyo Bay (Figure 1)! These challenges are met admirably, but perhaps at an irreversible cost to Japanese society, its natural resource base and the quality of life of its citizens. Not only are restoration opportunities limited in the Tokyo metropolitan area, but the few that are currently available target mainly “eco-societal” goals such as waterfront access and water quality, rather than restoration of natural habitats.

Figure 1: transitions of reclamation areas in Tokyo Bay.

biodiversity and ecosystem integrity. The coastline around Tokyo Bay appears to be fully “armored”, there are few natural areas remaining, and the natural shoreline is sited well inland from its original location because of reclamation activities. If not already there, the environs of New Jersey – New York Harbor seem to be headed on a similar trajectory.

It comes as no surprise, therefore, that the focus of our three day discussion centered on sustainable coastal economies and the balance among economic growth, quality of life and preservation of natural resources. The need to conduct mutual research on species and population level responses of economically and ecologically important species to habitat and ecosystem alteration, rehabilitation and restoration became a centerpiece of the discussions.

My overall impression was that this will not only be a great challenge for the Japanese, but will prove equally challenging in New Jersey’s own urban estuaries and ports. Considering “people in the landscape” has become a clarion call for future coastal zone management policy. Not only will the social

1 Tokyo, Population and Density by Ward, Japan Statistics Bureau and Tokyo Prefecture, Demographic Yearbook 1999.
2 US Census 2000 Summary, New Jersey, Place and County Subdivision
Right: CEST participants got a first rate tour of Tokyo Bay that included remarks and presentations in the main lounge.

sciences need to be better incorporated into the planning process, but landscape scale factors (whole ecosystems and watersheds) also need to be considered. I am reminded of a paper with a rather unique title written by Schubel and Hirschberg (1973) who comment “clearly, mankind is one of the most coastally dependent species in the biosphere. Humans use the shore zone for activities that may be, and indeed frequently are, in conflict. The continental shelf margins are exploited for their extractable resources, both organic and inorganic; for shipping and transportation; for military activities; as a repository for human and industrial wastes; as a source of cooling water for power generation; and as habitats for recreation and living space”.

The emerging field of sustainability science tackles the issue of humans in the landscape head on, by focusing research on the fundamental character of interactions between nature and society; and by addressing the latter’s capacity to guide these interactions along sustainable trajectories. Many of our universities are currently incorporating sustainability science into their curricula, ultimately to achieve degree granting status. Whether by watershed management, open space preservation, habitat restoration, pollution control and prevention, or by combinations of these and other integrated management approaches, New Jersey has an opportunity to leave our children a better world that we have inherited. As Dr. Ron Baird, Director, National Sea Grant College Program has commented “The principal political challenge of the 21st century will be reconciling environmental protection with coastal economic development. The very real danger is that environmental degradation may be moving faster than our current institutions (or technology) respond with widespread and potentially irreversible consequences for coastal environments.” New Jersey should heed this call to maintain its sustainability standards; we owe it to future generations.
"Phrag-mentor" Lorrie Gross Fuses Art, Culture and a Common Reed

by Marsha Samuel

Phragmites. It's not a word you hear everyday. You do, however, see it more often than you would suspect. It is Phragmites australis, more commonly known as the common reed. In New Jersey, Phragmites has, for all intents and purposes, taken over many wetland areas. It is the mother of all invasive plants, so much a part of the New Jersey landscape that it is virtually impossible to eradicate. For decades, ethnobotanists have insisted that the ubiquitous reed is injurious to the preservation of our wetlands. Recent research makes claims to the contrary. But while science debates the place of Phragmites in our ecosystem, there are those people who fly in the face of convention to assert that there is more to "Phrag" (as it is fondly called by those who know it) than meets the eye.

One such person is Lorrie Gross, a Philadelphia-based artist and sculptor who is no stranger to Phragmites. It has been years since Gross first heard the name of this familiar plant. Graduating from Kenyon College with a double major in art and religion, Lorrie Gross went on to earn a master's degree in Folklore and Folklife from the University of Pennsylvania. In 1978, she began work at the Philadelphia Center for Older People, working as part of a program called "Visual Arts in Public Service." During her time at the Center, Gross earned another master's in Social Gerontology; her thesis explored the effects of art class on the psychological well being of the seniors at the Center. It was in this environment that Gross truly absorbed the far-reaching advantages of art. "I developed ideas about the power of art as a communication medium,"

she says.

Leaving Philadelphia after six years, and deciding to use her background in art, Gross began an arts residency at The Delaware Center for Horticulture. She had no notion then the profound impact this decision would have upon her life. At the Center, a colleague explained to Lorrie the significance of Phragmites, saying that if humankind continued to destroy the environment, Phragmites would be all that was left. The same colleague pointed out to Lorrie that several patches of Phragmites grew around the Center; she was surprised to discover that it was simply the common reed. This plant that had been so familiar a sight to her was now a mystery. How could this seemingly harmless plant practically take over the planet? Intrigued, Lorrie began researching Phragmites australis.

Because Lorrie had always been interested in culture, in belief systems, and why people do and believe certain things, her research was more social than scientific. She was often surprised at the information she found. Although Phragmites grows commonly in large patches in the Americas, it is a non-indigenous plant, native only to Eurasia. One might surmise that with the mass influx of immigrants from Europe and Asia to America during the nineteenth and twentieth centuries, the...
spores must have come over and taken root on American soil. Gross discovered the many different uses of Phragmites in many of the Eurasian cultures. For instance, in Asia, Phragmites shoots were used as food and the flowering stem, or culm, was worn by women in their ears and also dyed and strung with beads to make necklaces and other jewelry. In the Philippines, it is used as fertilizer. In East Africa, Phrag was used for building fences around homesteads and in Australia, the reed was utilized by the Aborigines to make spears as well as for necklaces and ornaments for the nose. More recently, in the Middle East, Phragmites was used to make mats, baskets, and flutes. Lorrie was even more surprised to find that in an exhibit on ancient Babylon at the Smithsonian Institute, Phragmites is mentioned as material used by the Babylonians to make reed huts, as well as the thatch of the hut. Not bad work for a plant that’s been declared a “noxious weed” by thirty-five U.S. states.

Lorrie was inspired. Wanting to teach about Phragmites and knowing what she had learned at the Philadelphia Center for Older People, that art could be used as a medium for information, she drew on her background and experience. At the time, Lorrie was living in Philadelphia and she began using materials from her surroundings to create works of art that would serve to break down the barriers of information transfer. “Art is a significant cultural marker, among other things. It is a language of the human race—all people speak it,” muses Gross.

She sculpted pieces using polonium, foxtails, and, of course, Phragmites. Her work has been displayed throughout the Tri-State region, particularly at the Perkins Center for the Arts in downtown Philadelphia, where Lorrie currently teaches. Her exhibit includes articles such as necklaces, kites, and copies of Iraqui boats, which were created from the reeds during the Assyrian empire. Lorrie was inspired to build her own model and created a 10-foot boat using a Peruvian Caballito as inspiration, the Caballito traditionally made of Phrag.

The special element of Lorrie’s work is that she has not limited herself to the art galleries or to the playgrounds of the elite and educated. She brings her special brand of instruction to children, teaching in summer classes and art camps in mostly in Pennsylvania, but also in New Jersey through the New Jersey School of the Arts, Perkins Center for the Arts, and Long Beach Island Art Foundation; and in Delaware through the Delaware Center for the Creative Arts.

Recently, she initiated the “Phrag Project,” a program in which she educates school children about the reed’s history and use through arts and crafts. So far, Lorrie has developed over twenty projects that incorporate lessons about Phragmites in the project. Currently, Lorrie is also involved in a residency teaching third graders about our wetlands. One highlight of the residency is in helping the children to create “spirit kites” using Phragmites.

In mid-October of last year, the New Jersey Marine Sciences Consortium along with several other corporate partners sponsored the 4th Annual Coast Day NJ. Lorrie Gross was a featured guest at the event and received rave reviews for her interaction with the crowds. Her exhibit included hands-on activities demonstrating the usefulness of Phragmites. Children and adults alike built sculptures, kites, and bubble blowers using the stem and the flower of the reed. Honestly, the author of this article couldn’t resist joining in the fun.

If you ask Lorrie about her use of art, she will tell you that more than anything else, her art is a teacher—a teacher of history, of ecology, of science, and of culture. She will also tell you that it’s not that she wanted to become an artist—more than that, she needed to be able to use the act of creation in order to educate. Lorrie is fulfilling that purpose in communities across the area, bringing a new understanding of the remarkable history of a seemingly unremarkable plant.

If you want to see more of Lorrie’s work, you can venture into downtown Philadelphia and visit the Nexxus Gallery which exhibits Lorrie’s work at 137 N. Second Street, or view her work on the web at www.nexxusgallery.com.

Lorrie Gross demonstrates Phrag art during Coast Day NJ.
Coast Day NJ

by Sarah Albrecht, Student Correspondent

The New Jersey Marine Sciences Consortium's (NJMSC) Coast Day NJ "A Celebration of the Sea" held on October 13, 2002, was a huge hit this year. The event was centrally located on Fisherman's Wharf in Cape May, next to the Lobster House where music filled the air and people crowded the exhibits from 11 am to 4 pm. With free admission, plenty of parking, dozens of exhibits, and hourly tours, Coast Day NJ was packed with adults, teens, and children.

Crafts at various exhibits provided plenty of education and entertainment. Younger visitors could make fish prints at NJMSC's educational exhibit, touch crabs and sea urchins at the Richard Stockton College of New Jersey's touch tank, learn about fish farming at Cumberland County College's culture tank, and look at small creatures, like snails, through microscopes. The children could also pick up educational materials to bring home, like coloring pages about water management from the NJ Watershed Ambassadors exhibit. At one of the most unusual and popular exhibits, kids could make a sculpture from the stalks and plumes of Phragmites australis, an invasive weed found throughout coastal NJ. Children were even able to try on a commercial fishing safety suit or have their picture taken with Fern, the NJ flounder.

Adults were also able to learn while having fun. At the NOAA National Weather Service of Mount Holly, NJ exhibit, they could pick up small books about hurricanes, tornadoes, thunderstorms, and lightning. Other exhibits featured farm-raised oysters and clams and watershed management. A continuous video at the New Jersey Marine Sciences Consortium's (NJMSC) exhibit explained their research and outreach programs. One popular NJMSC handout was a bulletin about seals that choose to migrate as far south as New Jersey. The publication explains what to do if you find a stranded seal or encounter one in the wild. For those interested in marine science, many NJMSC Member Colleges, such as Cumberland County College, Georgian Court College, Stevens Institute of Technology, Rider University, Rowan University, Rutgers University and Richard Stockton State College showcased their marine science, aquaculture, and engineering programs.

One of the most exciting Coast Day NJ developments this year was the announcement about a Coast Day NJ display contest for middle school students for 2003! The class project contest for grades 5-8, was announced and advertised at this year's event, so interested classes can prepare a display based on the topic, "Why Commercial and Recreational Fisheries are Important to New Jersey". A panel from NJMSC will judge the entries and five finalists will be invited to display their exhibits at Coast Day NJ 2003, where they will be voted on by visitors. The prize is a Dell computer for the classroom, a Coastal Experience Field Trip from the NJMSC and a catered lunch, courtesy of a local restaurant on the day of the field trip. Classes will have between now and May to work together researching and designing an exhibit while learning about the importance of fisheries to New Jersey! One of the reasons I'm excited about the contest is that I'll be serving on the judging panel and as the Student Coordinator for the project. Teachers and students interested in finding out more about the contest can visit NJMSC's web site at www.njmsc.org.

This year's Coast Day NJ was sponsored by the New Jersey Marine Sciences Consortium, New Jersey Sea Grant College Program, Cumberland County College, Jersey Fresh, Delaware Estuary Program, Partnership for the Delaware Estuary Inc., Office of Maritime Resources and NJ Department of Transportation, ShopRite, and the Jersey Shore Partnership Inc. It offered something for everyone; maritime music performed by Jim Albertson of "Down Jersey", tons of free giveaways, tours of Fisherman's Wharf and the A.J. Meerwald, and lots of new, informative exhibits! From this student correspondent's point of view, Coast Day NJ gets A+ this year for offering a great way for kids and adults alike to have fun and learn a lot more about coastal New Jersey.

Sarah Albrecht, student correspondent

Lorrie Gross an artist from the Philadelphia area captivated visitors with her artwork and sculptures made from Phragmites australis, a common coastal weed.

THE JERSEY SHORELINE
Coast Day NJ Attracts Record Crowd

by Kim Kosko

NJMSC’s Education table drew big crowds who participated in marine and coastal craft activities.

Despite the ominous weather forecast and a soggy weekend elsewhere around the state, the sun shone brightly on Cape May for the New Jersey Marine Sciences Consortium’s (NJMSC) fourth annual Coast Day NJ celebration. Coast Day NJ, traditionally held the second Sunday in October, has become a popular fall celebration of New Jersey’s commercial and recreational fishing industries that promotes coastal education and ecotourism through hands-on activities and exhibits. It has grown significantly each year in sponsorship participation, exhibitors and public attendance. This year, Coast Day NJ coincided with Victorian Weekend which attracts thousands of tourists to the Cape May area, many of whom took the time to visit Coast Day NJ. Throughout the day, crowds of people waited on line to view the educational exhibits and experience the hands-on marine science displays, create coastal themed arts and crafts, tour the commercial fishing docks and packing plant, listen to maritime folksinger Jim Albertson, get a close up view and on-deck tour of New Jersey’s Official Tall Ship, the A.J. Meerwald and participate in marine science programs and activities at the Nature Center of Cape May. According to NJMSC’s President Dr. Michael P. Weinstein, who estimated attendance had tripled over last year, Coast Day NJ 2002 far exceeded everyone’s expectations.

For a report on Coast Day NJ 2002 from the perspective of Sarah Albrecht, an eighth grade student from Belvidere, NJ, see the companion piece on the previous page. Sarah has agreed to serve as the Coordinator for a Student Display Contest we’ve developed for middle school students for Coast Day NJ 2003. Sarah will be available throughout the school year to assist students with display design suggestions, research resources and contest-related questions. NJMSC is in the process of setting up a special page for the contest on its web site which will include a direct email address link to Sarah. Sarah will also be part of the judges panel that will select the five displays that will be showcased and voted on at Coast Day 2003 in Cape May.

Tours onboard NJ’s official tall ship the A.J. Meerwald were one this year’s Coast Day NJ highlights.

NJMSC President Dr. Michael Weinstein (left) welcomes Assemblyman Jefferson Van Drew (D-1) to Coast Day NJ.
Earlier this year, when the Barnegat Bay Watershed and Estuary Foundation (BBWEF) held its annual seminar in Toms River, it presented officials from Dover Township and Jackson with signs designed to promote stewardship of the watershed. The signs were distributed throughout the 37 towns that comprise the Barnegat Bay watershed, and given to all 33 municipalities in Ocean County, as well as Freehold, Howell, Millstone, and Wall in Monmouth County.

NJMSC's President, Dr. Michael Weinstein, was one of four experts invited to participate in the seminar to discuss air pollution's effect on the Watershed. One major probable source of pollution of the Barnegat Bay is through air deposition, in which particles of pollution from the air settle into the ground and in water. "It's true that what goes up must come down," said Dr. Weinstein, "but sometimes what goes up in Mexico or Columbus, Ohio [comes] down in the Barnegat Bay."

This pollution can come from a variety of non-point sources including thousands of locations in Ocean and southern Monmouth counties where rainwater drains into streams that flow into the bay.

Currently, research is being conducted to determine just how much of the pollution from the Barnegat Bay Watershed comes from the air. But even when this information is obtained, it will be difficult to reduce the pollution. One of the key factors to reducing that pollution will be legislation in New Jersey and its neighboring states that will create and enforce stricter air pollution controls.
Nearly 300 students from New Jersey, New York and Pennsylvania converged on Sandy Hook on October 27th, 2002 to take part in a special academic conference series sponsored by the Johns Hopkins University’s Center for Talented Youth (CTY) and coordinated by the New Jersey Marine Sciences Consortium (NJMSC). The daylong event, which combined presentations and hands-on marine science based activities, included the parents of all the students invited to participate.

The CTY’s mission is to inspire young people by offering distinctive educational opportunities that nurture intellectual abilities, advance academic achievement, and enhance personal development. According to Claire Antonucci, Director of NJMSC’s Education Department, “When Johns Hopkins contacted NJMSC earlier this year to see if we would be interested in organizing a program for CTY’s Fall 2002 Science and Technology Series, we were very enthusiastic. We discovered that the goals of CTY and those of NJMSC’s Education Department are very similar so we were very excited about creating a full-day of educational activities tailored to CTY’s needs that also utilized NJMSC’s vast pool of academic and membership resources.”

The theme for this year’s family academic conference was “Explorations in Marine and Ocean Sciences.” The day began with registration and an opening remarks ceremony at the historic Post Theater in Fort Hancock. In delivering the keynote welcome to the standing room only crowd at the Fort Hancock Post Theater, NJMSC’s President, Dr. Michael P. Weinstein noted, “Among you students here today are the next generation of marine scientists who will make milestones and breakthrough discoveries.” Weinstein, who quipped that not all the students in attendance would want to be attorneys or physicians, said he hoped they would be motivated by the day’s activities and hands-on experiences to “choose the excitement, challenges and satisfaction that marine science and related careers have to offer.”

The remainder of the day consisted of presentations on current topics in marine science and coastal issues, and hands-on activities at eight workshop stations, which were specially designed by NJMSC for the event and located at Sandy Hook’s North Beach and Horseshoe Cove. According to Dr. Michael Weinstein, “The event, particularly the presentations and hands-on stations required a tremendous amount of cooperation and coordination among scientists from NJMSC’s Member Institutions, its New Jersey Sea Grant College Program researchers, and other Sandy Hook based organizations like the NOAA NMFS Laboratory. Thanks to all of them, the day was a phenomenal success.
and we look forward to hosting another conference in the future.”

The CTY was established in 1972 to identify, challenge and reward academically able young people and offer them a wide range of academic opportunities and experiences. The Family Academic Conferences is CTY component that sponsored the recent event at Sandy Hook. The Science and Technology Series are offered every fall to eight and ninth graders and their parents. Students explore aspects of technology and science through hands-on workshops led by pioneering scientists, mathematicians, and researchers. For more information about the Johns Hopkins CTY program visit www.jhu.edu/gifted/

NJMSC is planning to adapt the highly successfully CTY conference series to it’s current Families Investigate Science Hands-On (FISH) series and offer a similar comprehensive, day-long program to New Jersey residents sometime next fall. Visit NJMSC’s web site at www.njmsc.org for more information.

Liesel Hotaling (center) of Stevens Institute of Technology lectures CTY participants at the Physical Oceanography workshop station on North Beach.

NJ Sea Grant Researcher Dr. Paul Jivoff of Rider University captivated the CTY students in the packed Post Theater with his morning presentation on Control of Invasive Species by Native Predators.

NJMSC’s Mike Nunez and Eileen MacHaffie demonstrate the basics of seining to CTY participants at the Nearshore Community Sampling Station.
Chance Conversation Plants the Seed for NJ Sea Grant Research Project.

by Dr. Louise S. Wootton, Assistant Professor of Biology, Georgian Court College

It's nearly 100 degrees outside. Heat is beating down from the summer sun above and pulsating up from the sand below. To make matters worse, the wind is blowing out of the west, carrying every biting fly in New Jersey to the area of dunes where my four dedicated student interns, Katy Bevaart, Audrey McGough, Jason Ondreika and Purvi Patel, and student volunteers Courtney Rella, Sheetal Patel, Anna Shipman and I are sitting counting plants and wondering how we all managed to get ourselves into this project.

Why are four students, an occasional volunteer and one rather fraught professor traipsing over sand dunes clearly labeled "Keep off the Dunes" in the height and heat of summer? The answer to that question actually starts with a conversation I had several years ago with coastal geologist Dr. Susan Halsey, who was working for the NJ Sea Grant College Program at the time.

"Louise. What do you know about Carex kobomugi?" Susan asked. "Carex what?" I answered. Susan then explained it was commonly called Asiatic Sand Sedge and is an exotic plant that's originally from Japan but which is now found on dunes from Massachusetts to the Carolinas. She went on to tell me that Park officials were talking about digging it up with a backhoe at Sandy Hook.

As a professor of Biology at Georgian Court, a small teaching college, I'm always looking for good projects that will get my students involved in research, so I went home and started to investigate the species Susan had mentioned. It was a pretty short search, since not much information was available.

I managed to find a few papers describing the first observations of the species in New Jersey, speculating that it had been accidentally introduced to North America approximately a century ago when shipwrecks released plants used to pack Oriental porcelain onto New Jersey's shores.

I also found some reports from Cape May's plant materials labs describing its dense foliage and disease- and trampling-resistance and their efforts make use of these properties by developing a strain of Carex kobomugi to be planted alongside native dune grasses to stabilize sand dunes.

Times have changed a great deal since then, and scientists and managers have become uncomfortably aware of the potential problems caused by exotic plants, such as purple loosestrife or Phragmites australis.

This changing perception, combined with a concern that Asiatic sand sedge was expanding in New Jersey, meant that Carex kobomugi suddenly went from a species being cultivated for release on dunes, to being listed as one of New Jersey's "top 10 most unwanted plant species" and one that the State's coastal parks were now working to eliminate.

What became clear to me, though, was that the management strategies were being implemented in the absence of much solid information on the spread rates and ecological impacts of the plant.

So it was, with the help of a grant from the New Jersey Sea Grant College Program and matching funds from Georgian Court's faculty summer research program, that my four interns,
several volunteers and I set out to map all of the Carex kobomugi beds in Island Beach State Park (IBSP) and the Sandy Hook Unit (SHU) of Gateway National Recreational Area. The goal was to compare the bed sizes with those in a survey carried out in 1985 by NJDEP. We also set up quadrants within and outside each bed and counted the number and types of plants present to get a sense of how Carex impacts the abundance and diversity of other plants on the dunes. Last, but not least, we set out to see how successful the management strategies currently being implemented by the parks have been.

To avoid the peak of the midsummer heat, we tumbled out of bed and onto the dunes at dawn and mapped and counted until heat or flies drove us away. We were blessed at both Island Beach and Sandy Hook with assistance from a group of fabulous park rangers and officials. At Island Beach, the park crews grew accustomed to fielding many phone calls and daily complaints about “those people who are walking all over the dunes”. Every morning we were greeted by the cleaning folks and other rangers with cheerful cries of “Good morning, dune people!” Park rangers kept their eyes peeled for Carex and made sure that we found all of the beds that were there. And so it was that we slowly hiked the entire length of the park mapping, identifying and counting the plants we saw... for a total of some 23 acres of Carex beds and over 100,000 plants counted. Then it was on to Sandy Hook to face a similar number of Carex beds and plants to map, but with the added luxury of park ranger, Jeanne McArthur, who was kind enough to ferry us out to some of the more distant areas of the park.

So what did we find? The data hasn’t all been crunched yet, but what we’ve seen so far tells an interesting, and somewhat alarming story. Relative to the 1985 survey in Island Beach State Park, the number of Carex beds has increased more than 300%, and the total area covered by more than 400%. Indeed, looking at the few available data points from earlier years, it’s clear that the species is expanding exponentially within our coastal dunes. Not only are there more acres of sedge on the dunes, but in the beds present in both our study and in 1985, stem densities of Carex have increased by 55%, implying that the
plants are becoming more vigorous over time.

What does this mean for other dune species? To some extent Carex is colonizing back dune areas in which other dune species do not thrive. However, numbers and diversity of other species within Carex beds were generally lower than those in comparable plots just outside those same beds, suggesting that the expansion of this species is significantly impacting the ecology and diversity of coastal dunes. Since some of the other species within the dunes, like wormwood, and sea beach amaranth are endangered or at least "Species of Concern" in New Jersey, the expansion of aggressive application of herbicide may be needed. Such a strategy would be likely to kill everything in the area. Moreover, from what we've seen, it is likely that even such an aggressive strategy would require multiple chemical applications over time to be effective. During that time the defoliated dunes would be vulnerable to erosion, resulting in flooding and damage to ecosystems and property currently protected by the dunes.

The logical solution to this problem might be to change our management goals from eradication to prevention of further expansion of the species. Hopefully, strategies such as those currently employed at Island Beach State Park could be used to reduce and control existing stands. However the effectiveness of such a strategy will strongly depend on the way in which Carex propagates itself. Existing literature suggests that the species grows only from runners, not from seeds, which would make containment relatively simple. However, one of my students, Michael Cerrato, has been working on this question for his honors thesis research at Georgian Court. His results suggest that this species will indeed grow from seed, if those seeds are grown at high enough temperatures. This finding means that controlling the spread of Carex is likely to be much more difficult.

Finding an effective management strategy for this species that won't hurt the dunes themselves isn't going to be simple. Next year, we plan to collaborate with scientists at Brookdale Community College to take the data collected this year and synthesize it with GIS mapping techniques to allow us to look for patterns in the dune position or types of community that are particularly susceptible to invasion by this species. We also hope to run "what if" model simulations to try to predict the ways in which this species may be expanding, and identify areas at high risk of future invasion to target for management or removal.

What's clear though, is that time is of the essence. The longer we wait to decide what to do with the species, the more of it there will be, making its removal increasingly difficult while increasing the potential damage the removal itself could do to the dunes and the communities they support.
Rowan With the Tide When It Comes to Marine Biology and Environmental Studies

by Dr. Courtney Richmond and Dr. Patricia Mosto, Department of Biological Sciences, Rowan University

As a predominately undergraduate institution, Rowan University offers courses in marine biology and environmental studies that are highly integrated with its teaching and research responsibilities. These courses give students ample opportunities to participate in field trips and research projects that extend and enrich their classroom learning.

The Department of Biological Sciences offers a number of classes relevant to marine and environmental science, including Marine Biology, Tidal Marsh Ecology, Ecology, Limnology, Environmental Toxicology, Conservation Biology, Environmental Science, and Invertebrate Zoology. Biology majors interested in specializing in environmental biology can take a number of courses in the Ecology, Environmental and Evolution (E.E.E.) track; non-majors can opt for a concentration in Environmental Studies. Starting in Fall 2004, the school will begin offering a Bachelor of Arts in Environmental Studies that will draw upon existing strengths at Rowan across many departments, by including faculty to teach topical and interdisciplinary courses that will graduate students well-versed in the complexity of environmental studies from natural, social science, and humanistic perspectives.

Because the field is often the best classroom, particularly in marine or environmental biology courses, students participate in both short and extended (week-long) field trips to a number of different locations. Day trips include the marine and estuarine habitats of Shark River, Corson Inlet State Park, Supawna Meadows National Wildlife Refuge, the Edwin B. Forsythe National Wildlife Refuge, and the Dennis Township and Commercial Township sites that are part of the Delaware Bay Estuary Enhancement Program. On these trips, students study marine organisms in their native habitats, collect data on how the abundance of estuarine organisms is related to the physical habitat, and examine the successes of a Phragmites control project. This past March, three Rowan biology faculty took 12 students on a one-week field trip to coastal South Carolina. The trip covered a diverse array of topics, including barrier island geology, intertidal mudflat infauna, Pfiesteria and other harmful algal blooms, controlled burns as a management tool in coastal maritime forests, the red-cockaded woodpecker which nests in the maritime forest of South Carolina, rocky intertidal organisms, and brackish and freshwater aquatic systems. On these trips, students apply the knowledge they learned in more formal classroom settings to organisms in the field.

In addition to classroom and field learning environments, Rowan University also strongly encourages students to conduct independent research projects under the guidance of a faculty member, and many take advantage of this opportunity. A few of the school's ongoing research projects are described below:

Great Egg Harbor River Project

This project's aim is to assess the impact of a canoeing and kayaking outfitter along the Great Egg Harbor River on the overall health of the river. To this end, several Rowan students are studying the river's algal and invertebrate communities and the chemical, physical and microbial water quality parameters, as well as the plant communities in the adjacent wetland habitats used as river access points. While water quality problems can be studied by analyzing physico-chemical parameters, they are best addressed by using living organisms as indicators of water quality. Biological indicators such as algae and invertebrates are used, since the presence or absence of certain species are good indicators of water quality. The students involved in this project are learning not only the tools used to assess environmental impacts, but are also being exposed to real-life situations where human, economic, and environmental interests can be at odds.

Rowan Creek Restoration Project

The Chestnut Branch of Mantua Creek is a typical example of an agricultural watershed undergoing suburban development. The stream bisects the

Rowan students check out marine specimens at the Belmar Marina.

Edwin B. Forsythe National Wildlife Refuge, and the Dennis Township and Commercial Township sites that are part of the Delaware Bay Estuary Enhancement Program. On these trips, students study marine organisms in their native habitats, collect data on how the abundance of estuarine organisms is related to the physical habitat, and examine the successes of a Phragmites control project. This past March, three Rowan biology faculty took 12 students on a one-week field trip to coastal South Carolina. The trip covered a diverse array of topics, including barrier island geology, intertidal mudflat infauna, Pfiesteria and other harmful algal blooms, controlled burns as a management tool in coastal maritime forests, the red-cockaded woodpecker which nests in the maritime forest of South Carolina, rocky intertidal organisms, and brackish and freshwater aquatic systems. On these trips, students apply the knowledge they learned in more formal classroom settings to organisms in the field.

In addition to classroom and field learning environments, Rowan University also strongly encourages students to conduct independent research projects under the guidance of a faculty member, and many take advantage of this opportunity. A few of the school's ongoing research projects are described below:

Great Egg Harbor River Project

This project's aim is to assess the impact of a canoeing and kayaking outfitter along the Great Egg Harbor River on the overall health of the river. To this end, several Rowan students are studying the river's algal and invertebrate communities and the chemical, physical and microbial water quality parameters, as well as the plant communities in the adjacent wetland habitats used as river access points. While water quality problems can be studied by analyzing physico-chemical parameters, they are best addressed by using living organisms as indicators of water quality. Biological indicators such as algae and invertebrates are used, since the presence or absence of certain species are good indicators of water quality. The students involved in this project are learning not only the tools used to assess environmental impacts, but are also being exposed to real-life situations where human, economic, and environmental interests can be at odds.

Rowan Creek Restoration Project

The Chestnut Branch of Mantua Creek is a typical example of an agricultural watershed undergoing suburban development. The stream bisects the
campus of Rowan University and collects all the storm water from the campus and surrounding community. Algae and invertebrates are being studied in the Chestnut Branch Creek (Rowan Creek portion) as indicators of water quality. Last year, prior to the creek restoration, algae and invertebrates were collected at several locations at different time periods. The algal genera (such as Phormidium, Pinnularia and Anabaena) and most of the invertebrates found in this creek are known as indicators of poor water quality. Given these findings, it has been inferred that the creek is under ecological stress and in a state of declining health. Once the creek is restored, which is planned for Fall 2003, the same study will be carried out to assess the water quality of the creek.

**Marine and Estuarine Ecological Projects**

Students are also working on a number of different projects on topics ranging from how environmental stresses (natural and anthropogenic) impact marine and aquatic organisms to field data collection designed to help manage waterfowl populations along the Delaware River. In the latter study, a student is working in collaboration with one of us and a biologist at the Supawna Meadows National Wildlife Refuge, on a project looking at wood duck nesting success at a number of locations on the refuge. The data collected in this study will help determine future placement of nesting boxes at Supawna Meadows.

Other projects include studying the effects of agricultural pesticides used in southern New Jersey on freshwater zooplankton, and the impacts of salinity fluctuations on the ubiquitous estuarine copepod, Acartia tonsa.

**Algae as Water Indicators of Nitrogen Deposition Project**

Atmospheric deposition of pollutants has become a popular research focus on a global basis. Most recently, the debate has centered on the role of nitrogen as a pollutant, indicating the need to identify 'critical loads' of this pollutant on ecosystems. In this study, algae are used as biological indicators of nitrogen pollution in specific bodies of water (ponds, lakes, and creeks in Southern New Jersey). This study, which involves four undergraduate students, will provide a baseline of information on rainfall and pond/lake chemistry and potential biological indicators of nitrogen pollution.

At the end of each academic year, each student is required to give a formal presentation of his or her research results in the STEM (Science, Technology, Engineering, and Math) symposium. Students display poster presentations, and are present to answer questions on their research project throughout the afternoon. This event is open to the public as well as the entire Rowan University community, and has been well-attended. In addition to this on-campus forum for research with undergraduates, many faculty members publish or present their collaborative work with students at national and international meetings.

As a part of the expansion of Rowan’s science education, including Marine Biology and Environmental Studies, the school is building a new $41 million state-of-the-art facility to house the Department of Biological Sciences and the Department of Chemistry & Physics. Construction began in January 2001 and the first classes will be held in this new facility during the Fall 2003 semester.

In addition, Rowan recently acquired a 72-acre parcel of land in Cape May County for development as an Environmental Field Station. This tract is an ecotone ranging from marshland to deciduous forest, composed of mildly acidic soil, with a sandy-loam texture. This healthy and diverse environment will provide many research project opportunities for faculty and students alike. Plans for a lab/field facility and access trails to the different areas within the tract are now being developed.

Rowan University’s commitment to its basic marine biology program, and support of its student participation research projects provides a full range of opportunities for anyone considering a career in marine and coastal sciences. To find out more about Rowan University’s marine biology program, student research projects or the new science building, visit [http://www2.rowan.edu/mars/depts/biology/biohome.htm](http://www2.rowan.edu/mars/depts/biology/biohome.htm).
Coastal Calendar...from inside front cover

February 27-March 2
16th New Jersey Boat Show
Over 300 boats will be on hand, from center console fishing boats to offshore sport fishing boats, bow riders to sport cruisers, personal watercraft to bass boats, deck boats to aluminum boats and more! In addition, a vast variety of boating and marine products will be available at the show. NJ Convention & Expo Center, 97 Sunfield Avenue, Edison. Visit www.macevents.com for more information.

MARCH

March 1, 2003
14th Annual Pinelands Short Course
Discover the flora and fauna of the NJ Pinelands, examine regional history and culture, and learn about plans to protect our nation’s first reserve. Workshops from 8 a.m.-3:30 p.m. (NJDOE approved for teacher professional development.) Held at Richard Stockton College on Jim Leeds Road in Pomona. Call 609-652-9000 for information.

March 27, 2003
Seaport Season Opener
10 a.m. to 5 p.m. at the Tuckerton Seaport, 120 W. Main Street in Tuckerton. For more information, call (609) 296-8868

March 28, 2003
A Partnership for Learning Teacher Workshop
A Partnership for Learning brings the benefits and excitement of environmental science and ocean education into NJ’s under resourced urban and rural schools. Applications for the spring session are currently being accepted. Upon acceptance, teachers will receive, at no cost to them or their schools, professional development training in marine and environmental science, a marine-based field trip for up to 50 students (including transportation costs up to $350.00 if needed), marine science classroom materials and in-school visits by NJMSC staff. Schools must allow 6 hours release time for teachers to attend the workshop at the NJMSC’s Sandy Hook Field Station. Visit NJMSC’s website at www.njmsc.org or call (732) 872-1300 for eligibility requirements or more information.

APRIL

April 5, 2003
Spring Conservation Volunteer Day
Help the Forest Resource Education Center plant seedlings, make trail improvements, and complete other special projects. Forest Resource Education Center, 370 E. Veterans Highway (Rt. 527) from 10 a.m. to 2 p.m. Contact (732) 928-0029 for further information.

April 26, 2003
National Wildlife Week Celebration
Tuckerton Seaport, 120 W. Main Street in Tuckerton. For details, call (609) 296-8868.
Ms. Ellen Calhoun
Library of Science and Medicine
Gov't. Publications Dept.
165 Bevier Rd
Piscataway, NJ 08854-8009