

# Marine Sciences Research Center



N E W S L E T T E R

Vol. 5 No. 2 Spring 1994

## High school students win with two MSRC science projects

### IN THIS ISSUE

- First Female Meteorologist Ph.D. Visits MSRC
- New Partnership with W. Meadow Conservation Center
  - MSRC's Romanian Student
- New Faces



Daniel Kramer of Mount Sinai High School was a finalist in the environmental category of the Long Island Regional Science and Engineering Fair, hosted by Stony Brook's Science Technology and Education Program (STEP). Kramer's project, supervised over the past two years by MSRC's Robert Aller, is titled, "Oxidation-Reduction Cycling of Manganese in Long Island Sound Water."

Aller, a biogeochemist, looks at the interactions between benthic animals (those associated with the sediment) and the cycling of metals, such as manganese. Knowledge of these processes is important in understanding the chemistry of sediments and the overlying

water, as well as in understanding the ecological interactions and adaptations of marine organisms.

To achieve this top honor, Kramer had to first compete with all Long Island school district students in a first cut that produced 88 contestants in eight scientific disciplines for the regional fair held at the University at Stony Brook's main campus on March 15. University faculty judged the entries, inspecting posters and interviewing the contestants, often asking graduate-level questions.

Kramer's first place win took him to the next and final stage — the international finals in Birmingham, Alabama in May — where he won the Grand Award in Environmental Science from Phillips Petroleum Company.

Northport High School student, Andrew Notarian, whose project was mentored by MSRC's Vincent Breslin was chosen as an alternate for the international finals in the environmental category. Notarian's project was to test the rates of breakdown of several biodegradable polymer films under various environmental conditions, such as those buried in soil.

His project has environmental implications, since many currently manufactured plastic articles found in the environment remain there for many years. If the starch-based polymers being tested by Breslin and Notarian break down faster into harmless components, they will have less adverse impacts on animals, as well as human aesthetics. ■

Vincent Breslin (R) and Andrew Notarian



Above, Robert Aller (L) and Daniel Kramer

## First female meteorologist Ph.D. visits MSRC

Joanne Simpson, this Spring's Distinguished Visiting Scholar at MSRC, has had a large dose of institutions and individuals throwing up barriers and slamming doors shut in front of her. That message was the topic of her talk at MSRC's informal Friday Discussion Group. But the subtext of her talk was that she managed to turn around the adversities and use them as advantages to become the first woman Ph.D. in meteorology (1949), an eminent atmospheric scientist, member of the National Academy of Engineering, and recipient of several awards from the American Meteorological Society, including its highest award, the Rossby Prize.

In recounting her difficult pathway to eminence, this very modern and youthful septuagenarian captivated her audience with anecdotes of career successes despite collegial disdain, insults, and shunning. Simpson exuded grace and a healthy sense of humor in describing the gender bias she endured from the 1940s until just recently. She related, for example, how she was fired from her job the day after she married a researcher at the same university because of strict nepotism rules and the belief that married women did not need to work.

But she never considered giving up her pursuit of a doctoral degree, despite being turned down by the University of Chicago for support in a Ph.D. program and having her application ignored by all the many other Ph.D. programs. Her first major break came when the Illinois Institute of Technology, the only institute that acknowledged her application for graduate school, responded by asking her to teach physics to their aviation cadets.

This allowed her to support herself while taking graduate courses at the University of Chicago and gain teaching experience.

A second turning point came in 1947, when she took her first field course in tropical meteorology. "When I took this course, it hit me—this is what I wanted to do," said Simpson, undertaking a project to learn how tropical cumulus clouds formed by flying an aircraft inside and outside of them. She later received a grant to study the flow of the atmosphere over heated islands, investigating cloud streams and working on what would become the first computer model of cumulus clouds.

Eventually Simpson was given an endowed chair at the University of Virginia but in the 1970s they were still hostile to female academics. "So I left," said Simpson. Later, she held positions as head of NOAA's Experimental Meteorology Lab in Coral Gables, Florida, and at UCLA where both she and her husband were hired as full professors, breaking the nepotism rules for the first time. She is currently Chief Scientist for Meteorology at NASA's Goddard Space Flight Center and Project Scientist for the Tropical Rainfall Measuring Mission, a joint NASA and Japan satellite program.

Simpson told of two other keys to her success: attending an all-girls' preparatory academy, where she could be smart without the intimidation that girls often feel in mixed classes, and being shunned by the male-dominated university community. "One advantage of being shunned was that I was left alone and had lots of time to think and do my projects." Remarking about the changes for women in science today, she said, "Look how many of you are here in this room," and added, laughing, "and the men aren't afraid to sit next to you."



▲  
Role model,  
Joanne Simpson,  
in her other role,  
as grandmother.

## Racers

MSRC students compete with faculty and staff in the annual five-mile Flax (Pond Laboratory) to VAX (computer facility at South Campus) race. The faculty and staff won this year's race.



## Picnic

The post-race picnic this spring was combined with the annual alumni picnic to celebrate MSRC's 25th anniversary.

## FACULTY AND ALUMNI NOTES

### Ed Carpenter and Kamazima

**Lwiza** spoke at an annual meeting of the World Wildlife Foundation in Washington D.C. in May. Also in May and June, Carpenter and his students took part in a month-long cruise aboard Texas A & M University's R/V GYRE to study the importance of nitrogen fixation in the central Atlantic Ocean.

**Roger Flood** served as co-chief scientist on the Ocean Drilling Program, Leg 155, to the Amazon Fan at the end of May.

**Darcy Lonsdale** received two new grants, one from New York Sea Grant on a proposal written with **Gordon Taylor** titled, "Impact of brown tide (*Aureococcus anophagefferens*) on microbial food web processes in a Long Island bay." The other grant is from Suffolk County Department of Health Services, Division of Environmental Services, on a proposal titled, "A field study of micro-zooplankton biomass and grazing."

Lonsdale attended the American Society of Limnology and Oceanography-American Geophysical Union (ASLO-AGU) Ocean Sciences meeting in February in San Diego, where she presented a poster with Terry Snell of Georgia Institute of Technology, titled, "Lectins bind to surface glycoproteins and inhibit mate guarding."

**Kamazima Lwiza** attended UNESCO's Intergovernmental Oceanographic Commission Planning Workshop, An Integrated Approach to Coastal Erosion, Sea Level Changes and their Impacts, hosted by the Institute of Marine Sciences in Zanzibar earlier this year. Lwiza, who is a native of Tanzania, served as one of the local-regional experts from the eastern coast of Africa.

**Akira Okubo** and **Robert Wilson** were invited to the International Workshop on Spectral Characteristics of Velocity Variations in the Sea and Their Significance for Dispersion and Mixing, held in The Hague, The Netherlands, in March. Okubo gave the keynote talk, "The historical view of oceanic diffusion: from radially-symmetric to chaos-induced diffusion."

**Mary Scranton** and her student **Hanguo Wu** presented a poster at the ASLO-AGU Ocean Sciences meeting in San Diego in February titled, "Acetate cycling in water column and surface sediments of Long Island Sound."

**Gordon Taylor** and graduate students **Jeanne Gulnick**, **Tim Anderson**, and **Dongkiang Zheng** attended the ASLO-AGU Ocean Sciences Meeting in San Diego in February. Gulnick, Anderson, and Zheng received travel awards to attend this meeting. Taylor's graduate student, **Mijin Lee** attended the 14th Milford Aquaculture seminar in February, presenting "The role of *Vibrios* and *Gymnodinium sanguineum* in unexplained juvenile oyster mortality at the F. M. Flower hatchery."

## New partnership forged with West Meadow Environmental Center

The soon-to-be renovated Marine Conservation Center at West Meadow Creek, a tidal inlet adjacent to Stony Brook harbor, will open its doors to the community at large for the first time since its inception. With a kick-off evening lecture series held in May, the conservation center inaugurated its new collaboration with MSRC to expand its

educational program agenda.

The Marine Conservation Center, a building with lecture and laboratory facilities constructed in the heart of an 86-plus acre wetland, has been largely underutilized during most of the year. In December 1992, high winds and water all but destroyed the building. Now, the Stony Brook Community Fund, custodians of the center and the surrounding wetlands, is restoring and improving the building to provide an array of year-round educational programs, aided by MSRC, for schools and the general public.

The new cooperative commitment between MSRC and the Community Fund will continue the

preservation of this magnificent wetland, now under consideration for designation by the New York Department of State as an "Outstanding Natural Coastal Area." The new classification will afford the area added protection. This partnership will also allow MSRC to teach environmental stewardship to many more citizens of Long Island than ever before, aiding in the preservation of all of Long Island's natural beauty and diverse habitats.

For information about new programs being offered this summer and fall, call Jim Mackin (632-8739) or Trudy Bell (632-8676) at the Marine Sciences Research Center, or the Stony Brook Community Fund (751-2244). ■

*Romanian continued from page 4*

credentials were often questionable, according to Giosan.

Since arriving at MSRC, Giosan has found he could catch up with modern science quickly and was able to use scientific instruments fairly easily. The expected big step from theory to application became smaller, he explained, because he had dreamed so often about how the instruments might be used.

Giosan looks forward to returning to Romania to conduct a comprehensive study of the region of the Black Sea bordering his country. "I hope that all Romanian students studying here and in western Europe think like me," he said, "that we must achieve new things here and then go back to try to help Romania." ■

*New Faces continued from page 4*

techniques yield truer values of metals found in the environment than previous techniques, which often inflated the concentrations by an order of magnitude.

**Diane Arwood** joined MSRC on April 4, moving from Normal, Illinois, to take the position of Instructional Support Technician for MSRC's new analytical laboratory. She will maintain, revamp, and supervise the instruments and do analyses such as total organic carbon, nutrients, and CHNS (carbon, hydrogen, nitrogen, and sulfur) analyses for all MSRC faculty and students.

Arwood received her M.A. in biological oceanography from the University of Southern Mississippi at Stennis Space Center, a NASA site, and she worked for the Navy at Stennis doing microbial technical support for one summer.

Between her undergraduate work at Illinois State University and her graduate work, she earned a good deal of experience with instrumentation, working for Shell Agricultural Chemicals in Illinois. For her Masters degree, she developed a toxicity assay using bioluminescence in phytoplankton and bacteria. Arwood has even acquired a patent for anti-biofouling paint, composed of an antibiotic—to stop bacteria that produce slime from growing on submerged objects. ■

**Marine Sciences  
Research Center**



State University of New York at Stony Brook  
Stony Brook, N.Y. 11794-5000

NON-PROFIT ORG.  
U.S. POSTAGE

**PAID**

STONY BROOK, NY  
PERMIT No. 65

Editor: T.M. Bell

Graphic Designer: L. J. Palmer

The State University of New York at Stony Brook is an  
Affirmative Action / Equal Opportunity educator and employer

Printed on paper containing 50% recycled materials.



## NEW FACES

**Joseph Roy Cash** was appointed First Mate this past February. Before coming to MSRC, Cash, who attended Port Jefferson High School, was captain and owner of the PORT JEFF ACE, a 65 foot passenger fishing vessel which scheduled fishing trips daily. Previously, he was a Petty Officer with the U.S. Coast Guard, serving 3-1/2 years sea duty, primarily in the inshore and offshore waters between Portland, Maine and Montauk, New York. Cash has also been an instructor for New York State boating safety programs.



Joseph Roy Cash

Before taking the position as First Mate, he served as Mate and Relief Captain of the MSRC's research vessel, ONRUST for cruises in New York Harbor and the Hudson River estuary.

**Sergio Sañudo Wilhelmy** joined the faculty of MSRC's Waste Management Institute in April. Sañudo, who is a native of Baja California, Mexico, held positions as lecturer of marine pollution and chemistry at the Autonomous University of Baja California before completing his Ph.D. in geochemistry at University of California, Santa Cruz, in June 1993. He was Research Geochemist at UC Santa Cruz's Institute of Marine Sciences until taking his position at MSRC.



Sergio Sañudo Wilhelmy

Sañudo will be looking at metals in solution (in rivers, lakes, and sea water) to determine whether they are occurring naturally or whether they have been introduced by humans. Since many metals occur in nature in very low concentrations, he uses ultra-clean techniques, for example, clean reagents and special air filters, to achieve a metal-free laboratory. These new, more rigorous



Diane Arwood

## Romanian student at MSRC

Liviu Giosan was determined to come to the U.S. to continue his graduate work after finishing his Masters thesis in geology at the University of Bucharest in 1992. He chose MSRC, hoping to learn more about practical applications for the theory that he



studied in Romania. He also wanted to learn for the first time about living in the absence of extremism—a balance his

country has not experienced since before World War II.

Graduate studies at Romanian universities have been almost entirely theoretical over a broad range of subjects, according to Giosan, with little opportunity to apply theory in the field or to conduct a real study because of lack of equipment and supplies.

"Beginning with the 1980s, the iron curtain was more dense than before, especially in Romania," said Giosan. The country limited its external academic relations to the former USSR and China, so news of scientific advances came from out-of-date publications.

While Romania has had a long, solid scientific history, including a Nobel Laureate in biology, during the communist regime, many scientists either fled the country or were imprisoned for failing to cooperate with the government. From the time the communist government was solidly installed until just recently, Romanian universities hired as teachers and researchers communist party members whose academic

*continued on back page*

*continued on back page*

Henry Bokuniewicz



### Coastal Geology from Long Island to Eastern Europe

Geological oceanographer Henry Bokuniewicz has studied a range of geological processes in almost all the waters surrounding Long Island, including sedimentation and groundwater effects in coastal bays and sea level rise and the evolution of Long Island Sound. His recent studies have also taken him to Eastern Europe to help scientists begin to rehabilitate their degraded environment.

Understanding sedimentary processes is important for several practical, as well as scientific, reasons. Fine-grained sediments, primarily silt and clay particles, are highly associated with contaminants, so geologists want to be able to predict the fate of sediments in the environment.

Sands, while rarely being associated with contaminants, are critical for recreational beaches. But sandy sediments can be as dynamic as wind or water, and may be lost naturally in great quantities during storms. Understanding the forces—tides and currents—that move sediments helps scientists like Bokuniewicz to predict changes in beaches, harbors, and other coastal environments that directly affect the quality of the shoreline.

Understanding transport of sediments is particularly important in estuaries—where density gradients form from river water mixing with sea water and where

there are mainly fine-grained particles—such as in Bokuniewicz's long-term study site, the Hudson River estuary. His earliest work there related to dredging and disposal of dredge materials, which has implications for port development and maintenance. And his most recent research effort, with MSRC collaborator and physical oceanographer Robert Wilson, is to re-examine the turbidity maximum and to forecast its behavior.

The turbidity maximum is a region of very high concentration of suspended solids, which tends to be related to vertical mixing and the movement of salt water from the ocean into the estuary on incoming tides. "In the Hudson, the turbidity maximum does not fit the classical picture of being maintained by an average tidal circulation or asymmetry," said Bokuniewicz. "We didn't understand how the water was moving."

Using acoustic Doppler (echo sounding) methods for recording where salt water was moving with respect to fresh water on the incoming and outgoing tides, Wilson found that as the tide is rolling out, there is a packet of high salinity water that becomes stationary on the bottom, and as the tide turns around, that salt water packet starts to move in on the bottom. "The idea we are working with now," said Bokuniewicz, "is that as it does that, it resuspends sediment and carries it along with it. This is an important piece of information for estuaries—it is hard to document, yet probably occurs more frequently than we thought. In the past we haven't been able to see this process at work because it just happens too fast for typical measuring methods to catch."

Bokuniewicz has recently begun a new project on foreign shores that grew out of a 1992 meeting held at MSRC with Eastern European scientists. The purpose of the

meeting was to address how MSRC scientists might help unravel the legacy of environmental degradation after the break up of the USSR. He is currently working with scientists in Romania and Poland to develop journal articles on shoreline erosion and pollution problems of the western Black Sea, including coasts of the Ukraine, Romania, Bulgaria, and part of Turkey, and along the Polish coast on the Baltic Sea. "The goal is to take a first step in producing a synthesis that will be published in the U.S. to draw attention to these problems in western literature and, ultimately, to secure funding to carry out research there," said Bokuniewicz.

In another new project, as director of the Groundwater Institute, a recently inaugurated cooperative effort, he is one of 11 faculty from MSRC and the University at Stony Brook's Departments of Earth and Space Sciences and Applied Math and Statistics, who will be investigating several aspects of Long Island's aquifer. The aquifer is important locally because it provides the only drinking water on the Island, and lies under land with a gradient of uses and stresses, ranging from densely urbanized in the west to the sparsely populated rural east end.

Bokuniewicz will be modeling and conducting geochemical research to trace nitrogen sources in areas of different land use through the aquifer to determine how they might enter the pristine Peconics estuary. "In this area, where there is little river input," said Bokuniewicz, "local groundwater discharge can be very important." But the importance of the Institute's research is not merely local. Long Island's aquifer has features typical of many coastal plain aquifers around the world, and so, will serve as an important natural laboratory.