



G. Rowland
President John H. Marburger (left) and MSRC Director
J. R. Schubel (right) congratulate Gene Feldman.

MSRC STUDENT RECEIVES GRANT FROM NASA

Gene Carl Feldman, an MSRC doctoral student, has received a research grant from the National Aeronautics and Space Administration (NASA)'s Graduate Student Researchers Program. Mr. Feldman will use the two-year, \$13,000 per year grant to conduct research at the MSRC and at NASA's Goddard Space Flight Center in Greenbelt, Maryland.

Mr. Feldman will study the distribution of phytoplankton in nutrient-rich waters of upwelling systems. Phytoplankton form the base of the marine food web, and when found in large concentrations (as they are in upwelling regions) are associated with major fishing activity. One such area near the Antarctic supports a large stock of krill, which, Mr. Feldman states, "holds great potential as a major fishery resource for the future."

Mr. Feldman will conduct his study with the use of satellite sensing systems, and will utilize data processing and computing facilities at the Goddard Space Center. He was one of about 40 graduate students selected this year to receive an award from the NASA Student Researchers Program. The Program was created to increase the number of scientists and engineers trained in the fields of aeronautics and space technology.

BLUFF EROSION ON LONG ISLAND'S NORTH SHORE -- JAY TANSKI

Bluff erosion along the shores of formerly glaciated areas such as New York, Massachusetts, and the Great Lakes Region

present serious management problems. Every year this erosion causes millions of dollars of damage to property, structures, and other facilities in these areas. On the north shore of Long Island alone, erosion losses are estimated at over five million dollars annually.

Bluff erosion is not only important in economic terms, however; it is also of great interest to scientists, managers, and planners because of the integral part it plays in the coastal sediment budget. In many areas this erosion is the major source of material to the littoral zone. Quantitative information on the amount and type of sediment supplied by bluff erosion is essential to the understanding and modelling of the coastal sedimentary system.

The purpose of my research was to examine the physical characteristics of bluff erosion on the north shore of Long Island and to determine: (1) the extent, frequency of occurrence, and persistence of intermittent erosional features on the bluff face and (2) the capacity of these features to supply sediment to the coastal sediment system.

Analysis of aerial photographs taken in 1976 of the area between Mount Sinai Harbor revealed that only about 25% of the bluff face is exposed (stripped of vegetation) and eroding. This exposure is not uniform along the coast. Values of the amount of bluff face exposed in discrete 5 km sections ranged from >5% to <5%. In general, the percentage of exposed bluff face is low in the eastern portion of the study area near Orient Point and higher in the central and western sections. The distribution of exposed bluff face is similar to the distribution of average annual recession rates along the shoreline. High recession rates corresponded with high percentages of exposed bluff face while areas with low recession rates exhibited low percentages of exposed bluff face.

Most of the features making up this erosion are relatively small. Since almost 40% of the erosion found on the bluff is comprised of features less than 300 m wide, small features play an important role in bluff erosion.

Comparisons between several sets of aerial photographs taken between 1930 and 1976 showed that the distribution of these features is not unchanging with time.

However, even though there were changes in the distribution, the total percentage of bluff face that was exposed did not change significantly between 1930 and 1976. This suggests that a steady-state condition exists where the rate of transition from vegetated to exposed bluff face must equal the rate of transition from exposed to vegetated. From the calculated rate of transition it has been determined that the individual erosional features along the coast should have an average life time of about 100 years.

Analysis of sediment samples collected from the bluff showed that overall all sand comprises 72% of the bluff by mass with the gravel and silt/clay fraction making up 16% and 12%, respectively. However, there is quite a bit of lateral variability in the composition of the bluff along the shoreline.

The sediment size data were used in conjunction with previously measured recession rates to calculate how much of this material is delivered to the littoral zone by bluff erosion. Bluff erosion supplies a total of 750 million kilograms of sediment per year. Of this 750 million kilograms, 570 million kilograms is sand, 130 million kilograms is gravel, and about 50 million kilograms is silt/clay.

The major source areas of this sediment are rather localized. It was found that three areas, which make up less than 30% of the total shoreline length, supply over 60% of the total amount of material delivered by bluff erosion.

The material eroded from the bluff is deposited temporarily on the beach. Wave action removes most of the sand and fine-grained material, leaving the gravel on the beach. Once it is removed from the beach a small portion of the sand is incorporated into the longshore drift. However, it appears that 84% of the sand supplied by bluff erosion, or 480 million kilograms per year, is transported offshore and lost to the deeper waters of the Sound.

A similar situation exists for the fine-grained fraction of the sediment load. About 20% of the silt and clay is trapped in the coastal marshes while 80%, or 40 million kilograms per year, is carried offshore and deposited on the Sound bottom.

In terms of coastal zone management this research has shown that small features comprise a substantial portion of the bluff erosion on the north shore. Management strategies must recognize the importance of small features if they are to be effective. More importantly, planners must consider the role of bluff erosion as a major source of sediment to the nearshore zone. Since the coastal sediment budget appears to be in a steady state, the data presented here indicate that about 25% of the bluff must be allowed to erode to maintain the status

quo. We don't know exactly how sensitive the conditions of the beaches are to changes in beach erosion but complete stabilization of the bluffs would probably cause the beaches to disappear in a relatively short time. Erosion can be retarded in some areas but should be allowed to continue or even start, in other areas having a large supply of suitable beach material.



J. Tanski

Section of the bluff showing exposed, eroding feature.

Jay Tanski conducted the study described here as part of his M.S. research; his advisor was Prof. Henry Bokuniewicz. This study was funded in part by the New York Sea Grant Institute.

"PROFILES OF A CHANGING COASTLINE" VIDEOTAPE AVAILABLE

A 15-minute videotape is available to libraries, schools, or anyone who is interested in Long Island's coastline. "Profiles of a Changing Coastline" details the creation and execution of a coastal resources study supervised by MSRC scientists and conducted by students at the East Hampton High School. This study was begun in 1979, and is still being carried out. Other schools have now begun to set up similar programs, and the videotape is intended in part to serve as a "training film" for those interested in conducting such a study.

The videotape is available in beta, VHS, and U-matic formats. For information, contact the Center at 516-246-7710. There is no charge for viewing the tape.

MSRC ASSOCIATES

We welcome Mr. Rory Fielding as a new MSRC Associate and

Ms. Kate C. Lefferts
Dr. and Mrs. Donald Pritchard
Mr. and Mrs. T. Schubel
Mr. William Swan
Long Island Lighting Company

as continuing associates.

AWARDS

Prof. Doug Capone received a grant from the National Science Foundation (NSF) to continue his studies of nitrogen transformation in marine sediments.

Student V. Monica Bricelj was awarded a Doctoral Dissertation Improvement Grant from NSF.

The University Awards Program selected Profs. David Conover and Jed Fuhrman as recipients of awards for 1981-82. Prof. Conover will use his award to study temperature-dependent sex determination in fishes; Prof. Fuhrman's award will support his research on bacterioplankton production in Long Island Sound.

Profs. Harry Carter, Robert Malouf, and Robert Wilson received additional support from the New York Sea Grant Institute to complete their work on identifying hard clam brood stock in Great South Bay.

Students Betsy Adamson and Joseph Bergstein were recipients of Sigma Xi grants-in-aid in support of their thesis research.

Prof. Mary Scranton is continuing her study of the role of cyanobacteria in the marine hydrogen cycle on a renewal grant from the Office of Naval Research.

Prof. Edward Carpenter received renewal awards from the New York Sea Grant Institute for his work on the recovery processes in a eutrophic estuary, and for his study of salt marsh nutrient exchange, in Great South Bay.

Prof. Bud Brinkhuis was awarded supplemental support from the National Oceanic and Atmospheric Administration for his analysis of eelgrass distribution and growth in Great South Bay by multispectral scanning.

NSF granted funds to Profs. Malcolm Bowman and Patricia Lapennas for their study of shelf dynamics and plankton productivity in Cook Strait, New Zealand.

PUBLICATIONS

BOWMAN, M. J., W. E. ESAIAS, and M. B. SCHNITZER. 1981. Tidal stirring and the distribution of phytoplankton in Long Island and Block Island Sounds. J. Mar. Res. 39:587-603.

McHUGH, J. L. 1981. Recent advances in hard clam mariculture. J. Shellfish. Research 1(1).

MICHAELS, R. A., R. GEORGE ROWLAND, and C. F. WURSTER. 1982. Polychlorinated biphenyls (PCB) inhibit photosynthesis per cell in the marine diatom *Thalassiosira pseudonana*. Env. Poll. 27(1):9-14.

PEOPLE AND MEETINGS

Prof. DOUG CAPONE and student DWIGHT REESE presented a paper at the meeting of the American Society of Microbiology.

Prof. IVER DUEDALL, one of the editors of a new book series entitled "Wastes in the Ocean," delivered the first volume of the series to John Wiley and Sons; publication is expected this fall. Other editors of the series include Dr. Dana Kester of the University of Rhode Island and Dr. Kilho Park of the National Oceanic and Atmospheric Administration. Dr. Bostwick Ketchum was an editor of Volume 1, "Wastes in the Ocean" which will cover industrial and sewage wastes.

The American Society for Microbiology invited Prof. JED FUHRMAN to speak on "Patterns of bacterioplankton secondary production in the Southern California Bight" at its meeting in Atlanta.

Prof. J. R. SCHUBEL chaired the mariculture session of the High Technology Conference sponsored by SUNY Stony Brook and State Senator K. LaValle.

Prof. WILLIAM PETERSON became a member of the St. Vincent/Long Island Partners Committee. The Committee was organized by SUNY Farmingdale to investigate ways to study and initiate research on agriculture, fisheries, and public health problems in St. Vincent (Windward Islands, the Caribbean). He also spoke at a meeting of Columbia University's Population Biology Club.

Staff member CLIFF JONES and student MINDY ZIMMERMAN completed construction of a Rapid Sediment Analyzer, a device to determine quickly the grain-size distribution of sediments by carefully timing the speed at which particles settle through a long column of water. The device will be used to analyze samples from Long Island beaches.

Student MARY GIBBONS attended the meeting of the World Mariculture Society.

Prof. DAVID CONOVER presented a paper at the annual meeting of the northeast division, American Fisheries Society. He also attended a meeting of the New York chapter of the American Fisheries Society.

MSRC HOSTS STATE OF THE SOUND CONFERENCE

On Saturday, May 22, the Center hosted the annual State of the Sound Conference, which was sponsored jointly by the Center and the Long Island Sound Taskforce (LIST) of the Oceanic Society. This conference focused on the technical, management and planning aspects for dredging and alternative disposal options in Long Island Sound, as well as on the future use of the Sound. It was well attended by government agency representatives, scientists, environmental

specialists, and other concerned citizens.

After a research update given by MSRC director J. Schubel, the meeting was addressed by experts not only in the application of the various dredged material disposal methods such as capping, submarine burial, wetland creation, and in the management of multiple options, but also in the regulatory processes for New York and Connecticut. In addition, a new research project on the techniques for assessing impacts from various disposal options, with an emphasis on field verification, was described by the project's coordinators--the New England Division of the Corps of Engineers--and by the scientists conducting this study. Finally, those attending the conference benefited from the insights into the potential effects of the new federalism on the future of dredging and disposal in the L.I. Sound region, as presented by a representative from the Connecticut Office of Coastal Area Management and the Director of the Office of Marine Pollution Assessment of NOAA, Dr. R. Lawrence Swanson.

MSRC LAUNCHES COSMA

President John H. Marburger announced that a grant from the William H. Donner Foundation will enable the MSRC to launch a new and innovative program in coastal oceanography and coastal zone management--COSMA. COSMA--Coastal Science and Management Alternatives--is a vehicle to bring together scholars from different disciplines and from different institutions to respond effectively to problems of coastal marine environments which result from society's uses of these areas. COSMA will concentrate on developing new and more effective ways of using scientific data and information in environmental management. Once a problem has been chosen for analysis through COSMA, the first step is to select the problem solvers. The next step is to identify the full range of plausible alternative ways of dealing with the problem.

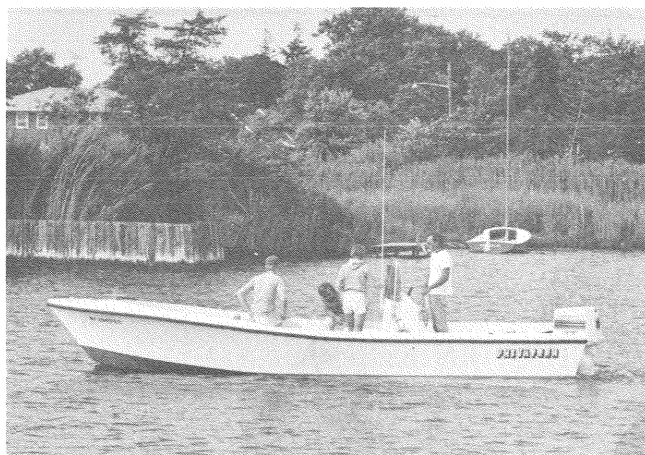
Then a rigorous assessment will be made of the environmental, economic, socio-political and public health effects associated with each alternative. After this analysis is completed, results will be cast in forms appropriate for decision making.

Dr. Schubel, Director of MSRC, pointed out that "the failure to identify the full range of alternative ways of dealing with environmental problems and to assess the advantages and disadvantages of each before setting policy has been a recurrent source of trouble in developing and implementing effective environmental policies.

The first project to be undertaken through COSMA is a case study of dredging and dredged material disposal in the Port of New York and New Jersey. One goal of the project is to develop an interactive data and information system using personal computers. The case study will be directed by Professor P. K. Weyl and will be carried out in collaboration with the Port Authority of New York and New Jersey, the N.Y. Department of Environmental Conservation, the U.S. Army Corps of Engineers, the Hudson-Raritan Estuarine Project Office and other agencies responsible for management of the Port. This case study is funded in part, by the National Oceanographic Data Center of the National Oceanic and Atmospheric Administration.

Provost Homer Neal described creation of the new COSMA program as "one more step in our plan to develop Stony Brook's already distinguished Marine Sciences Research Center into the international center of excellence in coastal marine sciences."

The Donner Foundation is a private foundation with nationwide interests. Named after the late William H. Donner, industrialist and philanthropist, the Foundation seeks to maintain the exceptional standard of excellence, innovation and commitment that he established in his business and charitable endeavors.



G. Rowland

The Center's new research vessel cruises to Core Creek in Blue Point, NY, for sediment sample collection.



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