J.L. McHugh Wins American Fisheries Society Award of Excellence for 1984

At its business meeting at Cornell University in Ithaca on 14 August 1984 the American Fisheries Society issued its Award of Excellence to MSRC's Dr. J.L. McHugh. The award consisted of a framed citation and a bronze medal suitably inscribed.

The American Fisheries Society has been in existence for over 100 years, having been organized in 1870. It established the award in 1969, and the first recipient was Dr. William F. Ricker, a distinguished Canadian fishery biologist, with whom Dr. McHugh worked in the early 1930s. Dr. McHugh's award was the sixteenth. The Society has a membership of over 8,000 and this award is considered its most prestigious.

In introducing Dr. McHugh, Dr. Donald Baker, Chairman of the Award of Excellence Committee, pointed to his long career in fishery science, which began more than 50 years ago, in 1929. He began with the Fisheries Research Board of Canada at Nanaimo, British Columbia, and worked part or full time until early 1941. He then joined the Canadian Army, where he served with distinction until late 1945, in Canada, England and France. After his discharge he returned to the Pacific Biological Station at Nanaimo, but soon went to the Scripps Institution of Oceanography in La Jolla, California, and received his Ph.D. from the
University of California at Los Angeles in 1950. Shortly after, he accepted an offer from the College of William and Mary in Williamsburg, Virginia to head up the Virginia Fisheries Laboratory, and served as its Director until 1959. In that year he joined the Bureau of Commercial Fisheries in the Department of the Interior, Washington, D.C. and served successively as Chief of the Division of Biological Research, Assistant Director for Biological Research, and Deputy Director of the Bureau. Then for about two years he became Director of the Office of Marine Resources in the Department, with responsibility for coordinating all Oceanographic Research in the Department. He also served briefly as Head of the Office for the International Decade of Ocean Exploration in the National Science Foundation before coming to Stony Brook in 1970. In 1982 he retired at age 70 but continues to do research at the Center as Professor Emeritus.

Professor McHugh has had many special appointments and honors, of which the most notable were as a Fellow of the Woodrow Wilson International Center for Scholars in 1971, and a three-year term as a member of the Mid-Atlantic Fishery Management Council from 1976 to 1979. Earlier this year he was elected by members of the National Shellfisheries Association to honorary lifetime membership in the Association. He is one of only 16 members to have received this honor in the past 20 years. Professor McHugh has published over 150 papers, chapters in books, and recently two books on fishery management and whaling.

This most recent exceptional honor is a fitting tribute to Dr. McHugh's distinguished career.

Mrs. Ward Melville met with MSRC Summer Fellows Andrea Ray and George Smith, whose internships she supported.

WARD MELVILLE SUMMER INTERNSHIP PROGRAM

In the summer of 1982 the MSRC Associates launched a new internship program to give outstanding undergraduates majoring in one of the basic sciences, mathematics or engineering an opportunity to conduct research in the marine sciences. The objective is to recruit more of the very best undergraduates into careers in coastal oceanography and coastal zone management.

The 1984 program was supported entirely by Mrs. Ward Melville. Three students, Andrea Ray, a geology major at the University of Chicago, Michael Cole, a physics major at SUNY Stony Brook, and George Smith, an environmental sciences major at Wesleyan University, were selected as our 1984 Ward Melville Summer Fellows. Miss Ray worked with Dr. James Eckman, Mr. Smith with Dr. Gary Zarillo, and Mr. Cole with Dr. Graham Giese. The research of previous summer fellows has been described at professional meetings and in the refereed literature.

RECENT MSRC GRADUATES

Ph.D. Degrees, May 1984

BRICELJ, V. MONICA
Advisor: R. Malouf
Thesis: Effects of suspended sediments on the feeding physiology and growth of the hard clam, Mercenaria mercenaria

GIBBONS, MARY C.
Advisor: R. Malouf
Thesis: Some aspects of predation upon the hard clam Mercenaria mercenaria by crabs

M.S. Degrees, May 1984

ANDRADE, SERGIO G.
Advisor: B. Brinkhuis
Thesis: First order analytical growth model of Laminaria saccharina with realistic dependence on seasonal factors

BOAMPONG, ERIC
Advisor: W. Peterson
Thesis: Abundance and Distribution of Eggs and Early Larvae of Bay Anchovy, Anochoa mitchilli in Long Island Sound and Controlling Environmental Factors

DEMOND, SUZANNE B.
Advisor: D. Conover
Thesis: Temperature-dependent sex determination in Cyprinodon variegatus and Fundulus heteroclitus

KIENE, RONALD P.
Advisor: D. Capone
Thesis: Effects of organic pollutants on sulfate reduction and methanogenesis in salt marsh sediments

KNUTSON, AMY BETH
Advisor: R. Malouf
Thesis: Sediment as a source of trace metals to the bivalve Mercenaria mercenaria
focus on research

MARINE BIOGEOCHEMISTRY - RESEARCH ON A NEW FRONTIER

"We're working on the borderline between chemistry and biology," says Mary Scranton of her particular area of interest in marine chemistry. Dr. Scranton, an Associate Professor of Marine Sciences at MSRC, seeks to understand how biologically produced chemical species such as the gases hydrogen and methane are cycled through the marine environment. Hydrogen and methane are produced and consumed in the water and sediments in a variety of reactions mediated by living organisms. In many anoxic environments, hydrogen is consumed by sulfate reducers, or by methanogens, in the course of the degradation of organic matter.

Hydrogen also plays a role as a regulator of some pathways of organic matter degradation. For example, an organism which produces hydrogen as a by-product may require a hydrogen consumer, such as a methanogen, to remove the hydrogen. These examples indicate the extreme complexity of the hydrogen cycle in anoxic environments. Hydrogen is also produced in oxygenated environments during the process of nitrogen fixation. Although blue-green algae are thought to fix large quantities of nitrogen in the open ocean, the importance of hydrogen cycling in the system is unknown.

Dr. Scranton traces her interest in marine chemistry to her senior year as a chemistry major at Mount Holyoke College. Her natural affinity for the ocean led her into the field of marine chemistry in the Woods Hole Oceanographic Institution/ Massachusetts Institute of Technology Joint Program in Oceanography. There she worked on the biogeochemistry of methane in the marine environment, demonstrating, that methane production must occur within the oxygenated waters of the surface ocean. She received her Ph.D. degree in 1977. From WHOI Dr. Scranton went to the Naval Research Laboratory in Washington, D.C., where she extended her work to the study of hydrogen in the ocean. At NRL she assisted in the development of techniques for measuring trace concentrations of hydrogen and began her study of its sources, sinks and rates of reaction. Dr. Scranton came to MSRC in 1979, and has continued her studies of the biogeochemistry of hydrogen.

Currently, Dr. Scranton is directing her research along three main lines of inquiry. In a long-term project she is investigating the role of hydrogen transfer between species of bacteria in controlling both hydrogen concentrations and fermentative processes in the bacterial communities of anoxic sediments. She and her students have sampled sediments in many coastal environments, collecting the first data ever obtained on hydrogen in marine sediments.

At the same time, Dr. Scranton and her students are developing techniques for studying the rates at which various types of anaerobic bacteria take up hydrogen in both the water column and the sediment. The goal is to develop a quantitative, closed model of turnover rates in different environments. This will be an important step in understanding the dynamics of carbon in the marine environment.

A third line of inquiry is the development of a model of the hydrogen cycle in the surface waters of tropical oceans. Dr. Scranton has shown that nitrogen-fixing organisms can measurably alter the concentration of hydrogen in the open ocean. Because the fragility of nitrogen-fixing organisms has prevented accurate measurements of hydrogen production, Dr. Scranton is currently developing sensitive, diver-operated, in-situ methods of analysis.

Although she works extensively with living organisms, Dr. Scranton emphasizes that her interest is chemical. "In my approach, the bacteria are black boxes in the sense that I'm not interested in their physiology. I'm interested in how the biology affects the chemical distributions. In this area of research it's important to combine techniques from biology and chemistry to understand what is going on."
A COASTAL GEOLOGIST BRINGS MODERN TECHNOLOGY TO THE SEASHORE

Wind and sand building new dunes, a sandy cape moving steadily northward, summer beach homes succumbing to a winter storm. For Gary Zarillo these are simply manifestations of the processes which are constantly at work forming and shaping the coastline. Dr. Zarillo, an Assistant Professor of marine geology at MSRC, studies the geology of shallow water marine sedimentary environments. He is interested in the physical processes of sediment transport: how shorelines evolve, and what kinds of processes maintain the various forms that we see, such as inlets, marshes, and barriers.

Most modern shorelines represent the product of several processes operating simultaneously. Sediment, in the form of mud, sand or gravel, is supplied from the land by wind and water and is distributed by currents and waves. Shorelines are built up of whichever sediment type is favored by the prevailing combination of forces: mud in quiet water with little wave action, coarser sediments in more energetic environments.

Beaches form in areas where the action of waves and currents supplies sand and removes fine-grained particles. The position and form of a beach changes constantly in response to changes in the forces acting upon a beach. Thus, the summer beach reflects the less energetic waves of calmer weather, while winter storms erode the beach, moving sand out beyond the influence of waves. Longer term changes in climate and sediment supply have corresponding long term effects on the shoreline. Understanding the relationship between the shoreline we see today and the forces acting upon it is Dr. Zarillo's goal.

Dr. Zarillo came to MSRC in 1982, and has been working on the wave and storm-dominated Long Island seashore. Currently he is working on several projects involving the rapidly changing south shore barrier beaches. He is developing conceptual models of sand transport and partitioning from source areas. This work has direct practical benefits, knowing how sediment moves, where it comes from and where it ends up permits the design of effective erosion control and beach fill programs. Dr. Zarillo points out that, "The success of beach fill projects depends upon matching the characteristics of the borrowed sand and the nature of the physical environment to the purpose of the project." So, for example, one would not nourish a high-energy beach such as those on the south shore of Long Island with fine sand because wave action would very quickly wash it away, whereas coarse sand would stay on the beach. Because transport is difficult to measure directly, Dr. Zarillo and his students are using trends in grain size and shape, as described by mathematical and statistical analysis of sand samples, as tracers of sources and processes.

Dr. Zarillo's interest in oceanography, combined with his B.S. and M.S. degrees in geology from the University of Rhode Island led him directly to the field of geological oceanography at the University of Georgia. He recognized that by combining the two fields he could create many opportunities for practical applications of scientific findings. His Ph.D. work on sediment transport in estuaries along the Georgia coast showed that the presence of salt marshes plays an important role in determining the tidal dynamics of back-barrier environments. He received his degree in 1979, and went to the University of South Carolina to work on the ocean face of the same tide-dominated shore line. He developed information on the dynamics of the barrier beach with which he advised the South Carolina Coastal Council on a barrier island management plan.

Dr. Zarillo is also interested in deducing the nature of paleoenvironments from the trace fossils found in rocks. Burrows, tracks, droppings and other traces of animal life are valuable clues which can be combined with the evidence of physical characteristics - grain size and shape, mineralogy and structure - to build a reasonably complete description of the environment in which the rock-forming sediments were laid down.

Dr. Zarillo always seeks to apply a fresh approach to his projects. "In a sense we are redoing old problems, but we are applying new technology. As an example, we're finding new applications for the study of grain shapes by borrowing methods from time series analysis. Fourier grain-size analysis has been very useful for bringing out source and process information. And the study of paleoenvironments via trace-fossil analysis was simply unheard of when I was an undergraduate."
MONTELEONE, DOREEN M.  
Advisor: W. Peterson  

REVELAS, EUGENE C.  
Advisor: R. Cerrato  
Thesis: The burrowing behavior of the hard clam, Mercenaria mercenaria

ULLMAN, DAVID  
Advisor: R. Wilson  
Thesis: Subinertial current oscillations in western Long Island Sound

AWARDS

In June the National Shellfisheries Association elected J.L. McHugh an Honorary Lifetime Member, and presented him with a citation for exceptional service.

MYRNA JACOBSEN and SETH YARISH received Harry and Helen Aibinder Scholarships for 1984-85.

PEOPLE AND MEETINGS

While on a leave of absence, SARAH HERRIGAN worked on nitrogen cycling in Chesapeake Bay from April to September, as a research associate at Harvard University's Museum of Comparative Zoology. Her project included sampling cruises in June and September on the R/V RIDGELY WARFIELD.

BUD BRINKHUIS was invited to give a paper on the New York Marine Biomass Program at the Southeast Industrial Biomass Energy Expo to be held November 27-29, 1984 in Atlanta, Georgia.

BUD BRINKHUIS and JOSE ZERTUCHE travelled to Universidad Autonoma de Baja California at Ensenada to initiate talks aimed at establishing a co-operative program with MSRC. Dr. Brinkhuis presented two seminars on seaweed mariculture, while Mr. Zertuche gave two talks to advanced undergraduates about studies at MSRC.

DAVID CONOVER presented two papers at the July meeting of the American Society of Ichthyologists and Herpetologists in Oklahoma City. One paper concerned the influence of temperature on the sex ratio of two fish species; the other concerned sex determination in the Atlantic silversides. He also presented a paper on sex determination in fishes at the August meeting of the American Fisheries Society at Cornell University.

J.L. McHugh presented a lecture on whales and whaling at the Center for Environmental Studies, Essex County (NJ) Department of Parks, Recreation and Cultural Affairs, on 13 July, and at the Mystic (CT) MarineLife Aquarium on 25 October.

MINDY ZIMMERMAN, JOHN HENNESSY and GEORGE SMITH presented a poster session entitled "Hypsometry as a tool for calculating coastal submergence rates" at the New England Coastal Engineering Research Conference in Rockport, ME, 30 October to 1 November. The paper's other authors are: GRAHAM GIESE, HENRY BOKUNIEWICZ, GARY ZARILLO and SARA TANGREN.

MONICA BRICEIŁ has joined the faculty of MSRC as a Research Assistant Professor.

DOUG CAPONE presented a talk on organic carbon reactions in anaerobic Hudson River sediments to the Hudson River Foundation Panel at the American Museum of Natural History on October 4.

BUD BRINKHUIS and JIN AE LEE attended the annual Phyecological Society of America meeting in Ft. Collins, Colorado in August. Each presented a paper on the kelp *Laminaria saccharina*, and Dr. Brinkhuis chaired a session on algal physiology.

DOUG CAPONE and JIM BAUER went to the University of Puerto Rico for two weeks in October to continue working on the Sea Grant-funded collaborative project on coastal eutrophication around La Parguerra, PR. They also participated in a 4-day cruise aboard UPR's R/V PEZMAR to study coral reef nitrogen cycling.

MARY SCRANTON participated in the Gordon Conference on Chemical Oceanography in Meredith, NH, 13-17 August.

PAUL NOVELLI and PETER LOUD participated in a research cruise aboard the R/V ALPHA HELIX to the Aleutian islands to sample dissolved gases in the water column. Adjunct Professor WILLIAM REEBURGH was the Chief Scientist.

ANNA MATTEOZA attended the Tropical Ocean and Global Atmospheric (TOGA) Scientific Programme Conference in Paris, 17-21 September. The purpose of the conference was to assess scientific programs for studying interactions between tropical oceans and the global atmosphere, such as the El Nino – southern oscillation phenomenon.

VALRIE GERARD conducted a seminar at the Shoals Marine Laboratory, on Appledore Island, NH, 10 August.
Chinese fisheries scientists touring the U.S. visited the Center in December to discuss the applications of artificial reefs to fisheries management.