ANNUAL REPORT

1977-78

Marine Sciences Research Center
State University of New York at Stony Brook

J. R. Schubel, Director

June 1, 1978

Part I  Summary Information
Part II  Narrative
Appendix A  Seminars and Colloquia
ANNUAL REPORT
1977-78
MARINE SCIENCES RESEARCH CENTER
PART I

DEPARTMENTAL ACTIVITIES

(1) A list of departmental seminars is attached. The Center sponsored 31 seminars during the 1977-78 academic year. Interest in receiving our seminar announcements continues to increase. The mailing list now includes 65 local agencies and individuals.

(2) Other departmental activities are covered in the narrative section following Part I. Highlights of the year include:

a. Board of Trustees and State Education Department approval of the Ph.D. program in Coastal Oceanography.

b. Submitted 61 research proposals, more than submitted in any previous year, with a total value of $3,293,090.

c. Conducted 56 sponsored research projects with a total value of $1,487,000.

d. Increased the Center's contribution series by 35 items.

e. Published 4 special reports.


g. Instituted a new 5-year B.S./M.S. course of study in geological oceanography.

h. Selected to host 1979 Annual Meeting of the American Society of Limnology and Oceanography (ASLO).

i. Robert E. Malouf appointed Sea Grant Professor of Shellfish Biology.
STAFF

(1) Faculty

a. Faculty Holding Academic Rank

Edward R. Baylor, Professor

Current research: Adsorption of viruses to air bubbles and the production of virus-laden aerosol particles both in the laboratory and on the beach.

Research grants: "Does the Surf Transfer Viruses to the Atmosphere?" Sponsor: NOAA/N.Y. Sea Grant Institute.

Accomplishments/ Community Service: Science Advisor to Congressman Downey and Assemblyman Hochbrueckner.

Harry H. Carter, Professor

Current research: Evaluating thermally induced biological effects due to once-through cooling systems; investigations of nature, degree and extent of turbidity generated by open water pipeline disposal operations; estuarine and coastal dynamics; turbulent diffusion.


"Field Investigation of the Nature, Degree and Extent of Turbidity Generated by Open Water Pipeline Disposal Operations" Sponsor: U.S. Army Corps of Engineers

Accomplishments/ Community Service: By invitation, presented lecture "A Rationale for Evaluating Thermally Induced Biological Effects Due to Once-through Cooling Systems" to the Maryland Academy of Sciences' Environmental Research Guidance Committee.
By invitation, presented a paper at the Symposia on Power Generation and the Aquatic Environment sponsored by the N.Y.S. Energy Research and Development Authority at MSRC.

Chairman, Workshop on Plume Entrainment--Thermal and Chemical Effects at the Symposia on Power Generation and the Aquatic Environment sponsored by the N.Y.S. Energy Research and Development Authority.

Participant, Workshop on Coupling of Estuarine/Shelf Waters sponsored by University of Rhode Island Center for Ocean Management Studies, URI Sea Grant, and IDOE/NSF.

J. L. McHugh, Professor

Current research: Preparation of an annotated bibliography of the hard clam; an analysis of trends and fluctuations in the fisheries of the Middle Atlantic Bight region (N.Y.-Va. inclusive); domestic and international ocean affairs; whales and whaling; fishery oceanography; fishery management.

Honors or Awards: Selected by the graduate students of MSRC as the recipient of the first MSRC Associates' Distinguished Teaching Award.


"History and Present Conditions of the Coastal Fisheries of the Middle Atlantic Bight and Causes of Fluctuations and Trends" Sponsor: NOAA.


University committees: Member, Jessie Smith Noyes Foundation Fellowship Committee.
Accomplishments/Community Service:

Continued to serve on the Mid-Atlantic Fishery Management Council and is presently serving on the Council's Executive Committee and Pollution Committee.

Continued as a consultant to the Town of Islip Shellfish Advisory Commission.

By invitation, participated in a Workshop on Causes and Control of Population Fluctuations in Commercial and Sport Fisheries, Lehigh University.

By invitation, lectured on Fishery Conservation and Management Act for the Environmental Policy Course, SUSB.

By invitation, participated in NOAA's Workshop on Maximum Yield.

By invitation, lectured on fishery management under extended jurisdiction at the Annual Meeting of the International Marine Archives.

Lectured to a class from SUNY, New Paltz on Fisheries of the Long Island Area.

By invitation, presented a paper "Atlantic Sea Clam Fishery: A Case History" at the North Carolina Governor's Conference on Fishery Management Under Extended Jurisdiction.

By invitation, presently serving as a member of the Steering Committee for the Workshop and Conference on Limited Entry into Fisheries sponsored by the Institute of Marine Studies, University of Washington.

By invitation, serving as a member of the Steering Committee for the planning of the Mid-Atlantic Fisheries Development Organization. At the April meeting, presented a paper "History of the Fisheries of the Middle Atlantic Bight Region."

Participated in Career Days at SUSB.

By invitation, presented the keynote speech "United States Clam Industry: Where Is It
Current research: Mathematic modeling for plankton patchiness; physical modeling for animal grouping in locomotion; anaerobic nitrite maximum in the Eastern Pacific Ocean.


University committees: Advisory Committees for C. Braumann and R. Michaels, Ph.D. candidates, Ecology and Evolution.


By invitation, presented a paper entitled "Horizontal Dispersion and Critical Scales for Phytoplankton Patchiness" at the NATO.
Current research:
Coastal sedimentation; suspended sediment transport; interactions of organisms and sediment; coastal zone management; effects of power plants on entrained fish eggs and larvae; dredging and spoil disposal; offshore sand and gravel mining.

Research grants:

"Thermal Effects of Power Plant Entrainment on Fish Eggs and Larvae: A Laboratory Assessment" Sponsor: Long Island Lighting Company.

"Contaminants in the Dredged Spoils and Benthic Organisms of Long Island Sound" Sponsor: NOAA/N.Y. Sea Grant Institute.

"Surface Sediment Distribution in Great South Bay" Sponsor: Nassau Suffolk Regional Planning Board.

"Development of a Zoning Plan for the Chesapeake Bay Estuary" Sponsor: The Rockefeller Foundation.


"A Zoning Scheme for the Chesapeake Bay" Sponsor: State of Maryland.

"Framework for a Study of Physical and Biological Processes of Great South Bay" Sponsor: NOAA/N.Y. Sea Grant Institute.


"The Importance of Large Flood Events to the Accumulation of Sediment and Particle-Associated Metals" Sponsor: National Science Foundation.

University committees:
Member, Search Committee for Associate Director for Research, Marine Sciences Research Center.

Accomplishments/Community service:
Member, Editorial Board of Earth and Extraterrestrial Sciences Journal

Served as a reviewer of the marine programs of the College of William and Mary, Va.


Member, Advisory Council, University National Oceanographic Laboratory Systems (UNOLS).

By invitation, presented the annual Sigma Xi lecture at East Carolina University in Greenville, North Carolina.


Convener and participant, Chesapeake Bay Dredging Workshops: July (SUSB) and Oct./Nov. (Pt. Deposit, Md.).
Leader of the scientific sessions for the N.Y. District Army Corps of Engineers workshop to identify and assess alternatives for the disposal of dredged materials.

By invitation, presented a lecture entitled "A Rationale for Evaluating Thermally Induced Biological Effects Due to Once-through Cooling Systems" to the Maryland Academy of Sciences' Environmental Research Guidance Committee.

Peter K. Weyl, Professor

Current research: Glacial paleoceanography; shellfish sanitation; marine environmental management; physical oceanography; monitoring bottom dissolved oxygen level in western Long Island Sound.

Offices in Professional Societies: Candidate for Vice President of American Society of Limnology and Oceanography.

Research grants: "Glacial Paleoceanography" Sponsor: National Science Foundation.

University committees: President's Committee on Equal Opportunity.

Accomplishments/Community service: Developed a proposal for HEW graduate fellowship program to advance minority members and women in civil service positions.

Member, National Research Council Review Panel for Associateship Program.

Organized Long Island Sound Conference held on Stony Brook campus, June 1977.

Represented J. R. Schubel at meetings of Marine Resources Council of Nassau-Suffolk Regional Planning Board.

Advised N.Y.S. Department of Environmental Conservation on Oxygen Standards and developed a research proposal for shellfish sanitation program and a monitoring proposal for Great South Bay.

Participant, Chesapeake Bay Dredging Workshops.
Malcolm J. Bowman, Associate Professor

Current research: Descriptive and dynamical oceanography of estuarine and coastal waters; water quality modeling; microstructure and turbulence; investigation of hydrography of N.Y. Bight Apex; transport of contaminants by oceanic coastal fronts.

Honors or Awards: University Award to study circulation and frontogenesis around headlands.

Research grants: 

"Biophysical Coupling in Frontal Zones" Sponsor: Maurice Hill Research Funds of the Royal Society in London.

"Investigation of Hydrography of the N.Y. Bight Apex" Sponsor: University Awards Committee.

"Transport of Contaminants by Oceanic Coastal Fronts" Sponsor: University Awards Committee.

"Tidal Stirring and the Distribution of Phytoplankton in Shallow Seas" Sponsor: National Science Foundation.

Accomplishments/Community service: Convener and participant, International Workshop on the Role of Oceanic Fronts in Coastal Processes held at Stony Brook.

By invitation, presented a lecture on "The Theory of Caballing Dynamics within Oceanic Fronts" at the Chapman Conference on Oceanic Fronts.

Oral presentation "Spreading and Mixing of the Hudson River Effluent into the New York Bight" at the annual workshop on physical oceanography of the Middle Atlantic Bight held at Lamont Doherty Geological Observatory.

Edward J. Carpenter, Associate Professor

Current research: Nitrogen cycling in the near surface waters; effects of duck wastes on Great South Bay; N\textsubscript{2} fixation in the Costa Rican rainforest.
**Offices in Professional Societies:**

- Nominated a "Member at Large" for the American Society of Limnology and Oceanography.

**Research grants:**

- "Nitrogen Cycling in the Euphotic Zones of the Caribbean and Southern Sargasso Seas" Sponsor: National Science Foundation.

**Accomplishments/Community service:**

- Member, Executive Committee of the NOAA Panel on Marine Pollution and Research Needs.
- Reviewer of the regional administrators' decision on the environmental impact of the proposed Seabrook, New Hampshire, nuclear power plant.
- Consultant to the Environmental Protection Agency to review environmental work done by consultants for the utilities located on the Hudson River.
- Participated in Stony Brook "Career Development Day."
- Awarded a joint appointment in the Department of Ecology and Evolution.
- Committee Chairman for a cub-scout pack.
- Coached a soccer team consisting of boys under 10 years of age.

**Iver W. Duedall, Associate Professor**

**Current research:**

- Measure the physical and chemical characteristics and transformations of suspended and sedimented particulate material in the New York Bight Apex; physical and chemical behavior of stabilized power plant calcium sulfate/sulfite and fly ash in seawater; determine rate and character of biological colonization of the stabilized scrubber wastes; investigation of the oceanography and sediment geochemistry of waters and sediment near
radioactive waste dumpsites; physical chemistry of silica in aqueous solutions of varying ionic composition.

Research grants:

"Marine Pollution Processes in the Bay of Concepcion, Chile" Sponsor: Tinker Foundation.

"The Physical Chemistry of Silicic Acid in Seawater" Sponsor: National Science Foundation.

"Chemical and Biological Effects of Power Plant Calcium Sulfate/Sulfite and Fly Ash in Seawater" Sponsor: Link Foundation.

Accomplishments/Community service:


Presented several papers on the disposal of coal wastes and sewage sludge in a special symposium on ocean dumping at the fall meeting of the American Geophysical Union.

Charles F. Wurster, Associate Professor

Current research: Effects of chlorinated hydrocarbons on plankton communities.

Awards: Selected by The Village Times as its "Man of the Year in Science" for 1977.

Research grants:

"Effects of Persistent Pollutants on Plankton Communities" Sponsor: NOAA; N.Y.S. Department of Environmental Conservation; N.Y. Sea Grant Institute.

"Effects of Persistent Chemical Pollutants in the Aquatic Environment" Sponsor: The Rockefeller Foundation.

Accomplishments/Community service: Presented the Paul Lemon Lecture in Ecology at SUNY, Albany.

Member, Board of Trustees, Executive Committee, Environmental Defense Fund.
Member, Board of Directors, Defenders of Wildlife.

Member, Board of Trustees, National Park and Conservation Association.

Henry J. Bokuniewicz, Assistant Professor

Current research:
Energy dissipation in a large estuary (Long Island Sound); groundwater flow across the floor of Great South Bay; dispersion of fine-grained sediment particles in a tidal flow (Long Island Sound) applied to the dispersal of dredged materials; sedimentary evolution of Long Island Sound and the tectonic control of sedimentation.

Awards:
University Award to study dissipation of tidal energy in Long Island Sound.

Research grants:
"Preliminary Study of the Groundwater Flow Across the Floor of Great South Bay"  
Sponsor: NOAA/N.Y. Sea Grant Institute.

Accomplishments/
Community service:
Participant, University of Rhode Island Workshop on the Coupling Between Estuarine and Shelf Waters.

Member, Search Committee for Associate Director for Research, Marine Sciences Research Center.

Member, Graduate Affairs Committee, Marine Sciences Research Center.

Member, Advisory Committee for the Reference Room, Marine Sciences Research Center.

By invitation, presented a paper entitled "Storm Energy in Estuarine Sedimentary Processes" at the spring meeting of the American Geophysical Union.

Awarded a joint appointment in the Department of Earth and Space Sciences.

Participated in Earth and Space Sciences Seminar to study seismicity and tectonics in the northeast U.S. (preliminary to the establishment of Stony Brook Seismic Network).
R. E. Malouf, Assistant Professor

Current research: Development of a rational management plan for the hard clam resource on Long Island; aquaculture.

Research grants: "Population Dynamics of the Great South Bay Shellfishery" Sponsor: NOAA/N.Y. Sea Grant Institute

Accomplishments/Community service: Volunteer advisor for the Shinnecock Indians Mariculture project.

Volunteer advisor to Towns of Brookhaven, Islip and East Hampton in their shellfish management programs.

Harold B. O'Connors, Jr., Assistant Professor

Current research: Coastal plankton ecology; primary production; patterns of plankton distribution; zooplankton feeding behavior; heavy metals in marine food webs.

Honors or Awards: University Award to assess the modification of herbivory by coastal eutrophication.


"Fate and Biological Effects of PCB in Marine Ecosystems" Sponsor: N.Y.S. Department of Environmental Conservation

University committees: MSRC/DEC Flax Pond Advisory Committee.

Robert E. Wilson, Assistant Professor

Current research: Estuarine and coastal ocean dynamics.

Research grants: "Effects of Bathymetry Changes in Circulation in Lower Bay" Sponsor: NOAA/N.Y. Sea Grant Institute

"An Experimental Determination of the Nature of Phytoplankton Patchiness in Long Island Sound" Sponsor: National Science Foundation.

University committees: Faculty Advisory Committee for the Computer Center.

Accomplishments/Community service: Participant in a workshop at the University of Rhode Island designed to identify important and tractable problems associated with the coupling of estuarine and continental shelf waters.

b. Faculty Holding Qualified Appointments

Martha B. Baylor, Adjunct Professor

Current research: Microbiology; airborne viruses.

Boudewijn H. Brinkhuis, Adjunct Assistant Professor

Current research: Uptake and mobilization of heavy metals by eelgrass using radioactive isotope techniques; primary productivity of phytoplankton and seaweeds; physiological ecology of marine organisms.

Research grants: "The Impact of Eelgrass on Heavy Metal Mobilization" Sponsor: Nassau Suffolk Regional Planning Board and N.Y. Sea Grant Institute.

"Assessment of Biological Effects of Sand and Gravel Mining in the Outer Bay of N.Y. Harbor and the Inner Bight" Sponsor: N.Y. Sea Grant Institute.

Accomplishments/Community Service: Member, MSRC Ship's Committee.

Member, Phycological Society of America; Atlantic Estuarine Research Society.

Member, MSRC Graduate Programs Committee.

By invitation, presented a paper "Physiological Ecology of Temperate Salt-March Macroalgae" at the IXth International Seaweed Symposium, Santa Barbara, CA.

Served on the IDOE Panel to review the International Seagrass Ecosystems Studies Program.
Arthur P. Cooley, Adjunct Associate Professor

Current research: Natural history of Long Island.

Ramesh Dayal, Adjunct Assistant Professor

Current research: Geochemistry of coastal sediments; clay mineral-seawater interactions; sediment-water interface interactions.

Research grants:


Accomplishments/Community service: By invitation, presented a paper entitled "Control of Interstitial Silica in Marine Sediments by Biogenic Silica and Clay Minerals" at the Annual Clay Conference in Kingston, Jamaica.

Wayne E. Esaias, Adjunct Assistant Professor

Current research: Studies of the phytoplankton distribution and productivity on the continental shelf south of Long Island and Georges Bank; measurement of sub-surface temperature chlorophyll distributions; studies of physical and biological processes controlling phytoplankton distributions in Long Island Sound; investigation of oceanographic fronts and their roles in controlling phytoplankton distributions in the English Channel.

Honors or Awards: Recipient of a John Murray Traveling Fellowship from the Royal Society of London.

Research grants:
"Continuation of MSRC Participation in the Brookhaven National Laboratory Coastal Oceanography Program" Sponsor: Brookhaven National Laboratory.

"Tidal Stirring and the Distribution of Phytoplankton in Shallow Seas" Sponsor: National Science Foundation.

University committees: MSRC/DEC Flax Pond Advisory Committee.
Accomplishments/
Community service: 

Search Committee, Associate Director for Research, Marine Sciences Research Center.

Co-convenor and participant, Workshop on the Role of Oceanographic Fronts in Coastal Processes held at Stony Brook.

P. G. Falkowski, Adjunct Assistant Professor

Current research: Marine phytoplankton ecology; phytoplankton physiology.

C. T. Fray, Adjunct Associate Professor

Current research: Coastal processes; geologic structure of continental margins; sedimentation marine geophysics.


J. M. Goodman, Adjunct Professor

Current research: Coastal zone management; aquaculture.

F. Goreau (Goro), Adjunct Professor

Current research: Scientific photography.

T. S. Hopkins, Adjunct Assistant Professor

Current research: Coastal current structure; water mass analysis; air-sea interaction.

David C. Judkins, Adjunct Assistant Professor

Current research: Plankton ecology; biogeography of plankton organisms and controlling environmental factors.

B. Kinsman, Visiting Professor

Current research: Waves and tides; estuaries.

Accomplishments/Community service:

One of four outside reviewers selected by the Council of Higher Education of the Commonwealth of Virginia to review all educational programs in the marine sciences, oceanography and ocean engineering offered by the public colleges and universities of the Commonwealth.


Irving Like, Adjunct Professor

Current research: Environmental law.

R. H. Meade, Adjunct Professor

Current research: Coastal and fluvial sedimentation; groundwater.

W. J. Meyers, Assistant Professor
(Joint Appointment with Earth and Space Sciences)

Current research: Carbonates; sedimentology.

J. R. Naidu, Adjunct Assistant Professor

Current research: Radioecology; radionuclides in the environment.

Joel O'Connor, Adjunct Associate Professor

Current research: Estuarine and coastal ecology; contaminants.

D. W. Pritchard, Adjunct Professor

Current research: Estuarine and coastal dynamics; coastal zone management.

O. A. Schaeffer, Professor
(Joint Appointment with Earth and Space Sciences)

Current research: Marine geochemistry; lunar studies.

D. F. Squires, Professor
and Director, N.Y. Sea Grant Institute

Current research: Marine affairs and science policy.
Harold M. Stanford, Adjunct Assistant Professor

Current research: Estuarine and coastal marine research; man's impact on marine environment.

Robert L. Swanson, Adjunct Associate Professor

Current research: Physical oceanography; hydrography of N.Y. Bight Apex.

O. W. Terry, Adjunct Associate Professor

Current research: Aquaculture, especially of seaweed; wetlands management.

Accomplishments/ Community service: Participant, Workshop on biosaline research, Kuwait University, Charleston, South Carolina.


Participant, Workshop on World Food Issues, Cornell University.

Member, Coop. Ext. Land Use Advisory Comm.; Sea Grant Shellfish Advisory Comm.; Symposium Organizing Comm. for Mariculture Symposium held at Southampton College.

J. J. Walsh, Adjunct Associate Professor

Current research: Upwelling ecosystems; phytoplankton ecology; modeling of continental shelf ecosystems.

T. E. Whitledge, Adjunct Assistant Professor

Current research: Nutrients; chemistry of seawater; stimulation of primary productivity by sewage effluent; ecosystem dynamics.

P. M. J. Woodhead, Adjunct Professor

Current research: Behavior and physiology of fish; coral reef ecology; ocean energy conversion systems.

Accomplishments/ Community service: Participant, New York State Energy Research and Development Authority Symposium on Power Generation and the Aquatic Environment held at Stony Brook.
Awarded a U.S. Patent for Ocean Thermal Energy Conversion Biofouling design.

c. Promotion and Tenure Actions

Assistant Professor Malcolm J. Bowman—Promoted to Associate Professor and granted tenure.

Assistant Professor Iver W. Duedall—Promoted to Associate Professor and granted tenure.

Associate Professor Edward J. Carpenter—Granted tenure.

(2) Non-teaching Professionals

George Carroll, Computer Programmer

Prepared, tested and ran about 120 computer programs in support of faculty, staff and student research activities. With Dr. Weyl, is designing a computer-link package and preparing analytical programs for the Department of Environmental Conservation. The project will bring computerization to the analysis, evaluation and processing of their voluminous and, heretofore, unanalyzed coliform data. The effort represents a landmark in integrating DEC research requirements and University facilities.

Carol Cassidy, Graphics Artist

Selected and trained a pool of part-time help to build up the capacity of the graphic department and provide full, timely support for faculty and staff publications. Managed the financial accounts for her department, now operated on a zero-base budget. Redesigned the graphics for the Center's Technical and Special Reports and prepared layout and designs for symposia brochures.

Peter K. deNyse, Assistant to the Director

Supervised the removal of the Center's field gear and equipment from the Point-of-Woods house to the Old Biology building on campus, and the construction of a small boat storage compound on South Campus. Completed plans for the SUNY-wide laboratory in "H" building and prepared specifications for the rehab work, now out for bid to local contractors. Completed rehab of various research laboratories to meet faculty requirements. Supervised installation of the Center's marine radio transmission base on the Health Sciences tower. Negotiated a service agreement to supply monthly seawater samples for a nuclear power plant research laboratory. Effected complete overhaul of departmental telephone system to comply with campus policy. Served on the campus Parking Policy Committee.
Andrew Hamilton, Electronics Technician

Provided engineering support for electronic instrumentation development and application to research projects. Repaired, maintained and calibrated the Center's very considerable inventory of field and laboratory electronic instrumentation. Participated in numerous research cruises, including MSRC projects on other vessels off the coast of Peru, in the Gulf of Mexico, and most recently, in the coastal waters of Wales.

Frederick G. Roberts, Associate Director

Departmental budget review and coordination of research proposal submissions (representing over three million dollars in the 1977-78 year). Sponsor and Research Foundation coordination for funded projects. Awarded a CETA grant providing an accountant/auditor for internal and external accounts. Completed audit records and documentation for major service facilities of the Center including the R/V ONRUST. Coordination for 20 instructional visits and/or cruises for other SUNY campuses.

Helmut C. Stuebe, Research Vessel Captain

Captain of the Center's R/V ONRUST for 95 days at sea in support of research and instructional cruises. Maintained his perfect record of accident-free operations. As a machinist, tooled housings and other parts for field and laboratory research equipment. Rehabilitated the trimaran platform boat transferred to MSRC from the Engineering School and put it into operation for support of the artificial reef project and other work in local embayments. Inspected, repaired and maintained the Center's Boston Whalers now operating in Great South Bay on five separate projects.

(3) New Faculty Appointments, Effective 1977-78

Henry J. Bokuniewicz, Assistant Professor; Research Associate, Yale University; near shore transport processes, coastal sedimentation, marine geophysics.

Harry H. Carter, Professor; Professor part-time, Marine Sciences Research Center, SUSB and Research Scientist, Chesapeake Bay Institute, Johns Hopkins University; estuarine and coastal dynamics, turbulent diffusion.

Robert E. Malouf, Assistant Professor; Research Assistant, Oregon State University; shellfish biology, aquaculture.

(4) Terminations, September 1, 1977-May 31, 1978


b. Robert A. Comeau, Research Vessel Mate, resigned.
5) Post-doctoral Fellows

Dr. C. Donald Powers, U.S. citizen, Ph.D. from Michigan State University, 1969; sponsors: N.Y. Sea Grant Institute and Rockefeller Foundation. Co-investigator with Profs. C. F. Wurster and H. B. O'Connors for a field and laboratory study on the effects of organochline compounds on plankton productivity, speciation and secondary production. Author or co-author of three scientific papers; invited lecture at Michigan State University entitled "A Wayward Virologist: From IBV and VEE to DDT and PCBs".

Dr. Douglas C. Biggs, research post-doctoral fellow, resigned August 1977 to accept Assistant Professorship at Texas A&M.
Marine Sciences Research Center

Baylor, Edward R.; Professor


Biggs, Douglas; Post-doctoral Fellow


Bokuniewicz, Henry J.; Assistant Professor


Bowman, Malcolm J.; Associate Professor


Brinkhuis, B. H.; Assistant Professor

Carpenter, E. J.; Associate Professor


Carter, Harry H; Professor


Duedall, Iver W.; Associate Professor


Kinsman, Blair; Visiting Professor


Malouf, Robert E.; Assistant Professor


McHugh, J. L.; Professor


O'Connors, Harold B.; Assistant Professor


Okubo, A.; Professor


Powers, C. D.; Post-doctoral Fellow


Schubel, J. R.; Professor


"Pb-210 Determined Sedimentation Rate, and Accumulation of Metals in Sediments at a Station in Chesapeake Bay", Chesapeake Science, Vol. 18, 1977, pp 379-382.


Terry, O. T.; Adjunct Associate Professor


Wilson, Robert E.; Assistant Professor


Woodhead, Peter M. J.; Adjunct Professor


Wurster, C. F.; Associate Professor


ANNUAL REPORT
1977-78
MARINE SCIENCES RESEARCH CENTER
PART II

A SUMMARY OF 1977-78 AND A LOOK AHEAD

In our last annual report we pointed out "the 1976-77 academic year was probably the best yet in the history of the Marine Sciences Research Center." This year was even better. MSRC continues to grow in stature as a coastal oceanographic research institution.

Several features distinguish the Marine Sciences Research Center from other leading oceanographic institutes. One is its clear focus on the coastal marine environment. There are very few outstanding coastal oceanographic institutes in the country. MSRC is one of them. A second feature that distinguishes MSRC is the effectiveness with which it has attacked problems of the marine environment on both theoretical and applied levels. Another distinguishing feature is MSRC's commitment to translating the results of its own research and that of others into forms readily usable by decision makers in resolving important environmental problems of the coastal ocean. Our pervasive goal is to be the best--most effective--coastal oceanographic research institute in the world.

The focus of our efforts in research, education and public service continues to be on the coastal marine environment. The geographical emphasis has traditionally been on New York's coastal zone. That emphasis persists, but we recognize the need to expand our work to other areas. Within the past two years we have conducted sponsored investigations in the: North and South Atlantic Ocean, North and South Pacific Ocean, Gulf of Mexico, Corpus Christi Bay, Atchafalaya Bay, English Channel, Caribbean, Chesapeake Bay, Chesapeake and Delaware Canal, Lake Michigan, as well as in most local coastal water bodies. Within the next 12 months we expect to have sponsored research projects in these same areas as well as in coastal waters of Mexico, Chile, New Zealand, Alaska, Lake Ontario, and a tropical rain forest in Ecuador.

MSRC is relatively unusual in what it does and unusually effective in doing it--a surefire combination for success. The MSRC is rapidly developing into a center of international excellence in coastal oceanography; in research, in graduate education, and in public service. This development has been achieved, primarily, by more effective use of existing resources. During the past four years the MSRC has received two new O.R. faculty lines (# 25003, #75192). A third faculty line has been funded entirely by the New York Sea Grant Institute but only for its initial three-year period. Two of these lines--# 25003 and the
Sea Grant position—became available for the fall term of 1977. The third line to be used for an Associate Director for Research becomes available 1 September 1978. On the other hand, we have suffered a net loss of two support lines. A commitment has been made for an additional support line for a mate for the ONRUST for September 1978. The total number of State secretarial lines remains unchanged at four. Changes in personnel resources over the past four years are evident from Table 1.

<table>
<thead>
<tr>
<th># Faculty Lines</th>
<th>Academic Year</th>
<th>Projected</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>74-'75</td>
<td>75-'76</td>
</tr>
<tr>
<td>O.R.</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>I. &amp; D.R.</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Sea Grant</td>
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<td>—</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td># NTP Lines</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td># Secretarial Lines</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

MSRC has suffered a net loss in OTP resources over this same four-year period. These are summarized in Table 2 and in more detail in Table 3.

<table>
<thead>
<tr>
<th>Source</th>
<th>Academic Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>74-'75</td>
</tr>
<tr>
<td>O.R.</td>
<td>$82,800</td>
</tr>
<tr>
<td>I. &amp; D.R.</td>
<td>5,000</td>
</tr>
<tr>
<td>Total</td>
<td>$87,800</td>
</tr>
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</table>
Table 3. Summary of OTP Supports, 1974-78.

<table>
<thead>
<tr>
<th>O.R.</th>
<th>'74-'75</th>
<th>'75-'76</th>
<th>'76-'77</th>
<th>'77-'78</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temp. Serv.</td>
<td>$4,000</td>
<td>$3,500</td>
<td>$4,380</td>
<td>$4,000</td>
</tr>
<tr>
<td>S. &amp; E.</td>
<td>44,000</td>
<td>35,238</td>
<td>25,200</td>
<td>45,200</td>
</tr>
<tr>
<td>Recharge</td>
<td>34,800</td>
<td>34,600</td>
<td>33,450</td>
<td>28,600</td>
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<tr>
<td>Totals</td>
<td>$82,800</td>
<td>$73,338</td>
<td>$73,030</td>
<td>$77,800</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>I. &amp; D.R.</th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Temp. Serv.</td>
<td>$500</td>
<td>$500</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>S. &amp; E.</td>
<td>4,100</td>
<td>4,400</td>
<td>3,500</td>
<td>2,500</td>
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<tr>
<td>Recharge</td>
<td>400</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Totals</td>
<td>$5,000</td>
<td>$5,000</td>
<td>$3,600</td>
<td>$2,600</td>
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</tbody>
</table>

Over the past five years our extramural funding of sponsored research has increased by more than a factor of three as shown in Table 4 and continued growth is anticipated.

Despite its losses in OTP funds and NTP lines, the MSRC has made impressive studies in improving the quality of its educational and research programs. This improvement in the quality of its work is dramatic and is documented in external reviews made in 1975 and 1977 by some of North America's leading oceanographers.

MSRC is still small. Its faculty numbers only 14 with one additional line we expect to fill during the fall semester. We hope to add an additional faculty member at the assistant professor level for the fall of 1979 and have requested a line. This line should probably come from the I. & D.R. budget to support our growing graduate program; at present we have only four instructional lines. MSRC can be a major factor in helping SUSB attain its goals as a University Center for graduate education and research. Probably no other department presents as great an opportunity anywhere within SUNY.

An appropriate steady State faculty for MSRC would, in my opinion, number about 20; a not unreasonably large number for the Center in the marine sciences for the largest University system in the Country. We should reach this size within the next 3-4 years.

Research

- Sea Grant Professorship in Shellfish Biology Established.

MSRC, with the strong support of the SUSB administration, was selected by the New York Sea Grant Board of Governors from among 7 competing institutions to receive the first Sea Grant Professorship.
Table 4
SPONSORED RESEARCH AT MSRC
Funding and Sponsors – A Five-Year Summary

<table>
<thead>
<tr>
<th>Sponsoring Agencies</th>
<th>'73-'74</th>
<th>'74-'75</th>
<th>'75-'76</th>
<th>'76-'77</th>
<th>'77-'78</th>
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<tbody>
<tr>
<td>FEDERAL</td>
<td></td>
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<tr>
<td>NSF</td>
<td>$19,617</td>
<td>$66,707</td>
<td>$58,383</td>
<td>$91,803</td>
<td>$148,193</td>
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<tr>
<td>NOAA</td>
<td>34,963</td>
<td>38,581</td>
<td>24,920</td>
<td>86,873</td>
<td>84,040</td>
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<tr>
<td>NOAA/Sea Grant</td>
<td>118,542</td>
<td>64,845</td>
<td>112,532</td>
<td>167,667</td>
<td>139,698</td>
</tr>
<tr>
<td>Other (EPA, ERDA, Army Corps)</td>
<td>8,669</td>
<td>236,840</td>
<td>207,051</td>
<td>338,188</td>
<td>167,127</td>
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<tr>
<td>Totals</td>
<td>$181,771</td>
<td>$406,973</td>
<td>$402,886</td>
<td>$684,531</td>
<td>$539,058</td>
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<td>STATE AND LOCAL GOVERNMENT</td>
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</tr>
<tr>
<td>NY ERDA, NY Office of General Services</td>
<td></td>
<td></td>
<td>58,646</td>
<td>125,475</td>
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<tr>
<td>Bi-County Planning Board</td>
<td>20,454</td>
<td>29,160</td>
<td>21,612</td>
<td>3,500</td>
<td>16,810</td>
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<tr>
<td>Nassau &amp; Suffolk Counties</td>
<td>0</td>
<td>72,350</td>
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<tr>
<td>Totals</td>
<td>$20,454</td>
<td>$101,510</td>
<td>$21,612</td>
<td>$62,146</td>
<td>$142,285</td>
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<td>PRIVATE FOUNDATIONS</td>
<td>1,400</td>
<td>2,950</td>
<td>30,200</td>
<td>43,696</td>
<td>67,257</td>
</tr>
<tr>
<td>TOTAL ANNUAL RESEARCH FUNDING</td>
<td>$203,625</td>
<td>$511,433</td>
<td>$454,698</td>
<td>$790,373</td>
<td>$748,600</td>
</tr>
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</table>
Dr. Robert Malouf, Assistant Professor, was appointed in September for a three year appointment as Sea Grant Professor of shellfish biology. The New York Sea Grant Institute provides full salary support for the first three years, as well as research support. SUSB has made a commitment to continue the appointment. Dr. Malouf has developed an important and comprehensive research program concerning the hard clam resource of Great South Bay. The hard clam is New York's most important single fishery with a total estimated value of approximately $100 million per year. Great South Bay is the Nation's most prolific hard clam "factory" accounting for nearly half of the total U.S. harvest.

• Sponsored Research Support Continues to Grow.

This year has been a very successful one for MSRC. According to RF data, MSRC ranked

* Second among all 55 departments at SUSB in number of research proposals submitted.
* First among all 55 departments at SUSB in number of awards.
* Seventh among all 55 departments at SUSB in total dollars.
* First among all 55 departments at SUSB in number of dollars per State-funded faculty (> $71,000/faculty) and outstripped its nearest competitor by 1.5 x.

This year our rankings will be even better. MSRC faculty generate approximately $1.50 for every $1.00 we receive from the State and the ratio is increasing. The New York Ocean Science Laboratory, also supported by the State, raised less than 2¢ for every $1.00 they received from the State.

On 25 May 1978 we received an unofficial notification that our more than $3,000,000 project on disposal of stabilized coal wastes in the marine environment had been approved. Funding will be provided by a consortium of State and Federal agencies. This is one of the largest awards SUSB has ever received. MSRC was the lead department in generating this project which will also provide support to faculty of the Department of Mechanical Engineering.

• MSRC Hosts National and International Workshops.

During the 1977-78 academic year MSRC hosted four important workshops and symposia with support from a variety of Federal and State agencies. The topics were:
Power Generation and the Aquatic Environment
(N.Y. Energy Research and Development Authority,
N.Y. Sea Grant Institute)

Dredging and Dredged Material Disposal in the
Aquatic Environment
(State of Maryland, Rockefeller Foundation,
N.Y. Sea Grant Institute)

Long Island Sound Conference

Current Topics in Estuarine Research
(U.S. Department of Energy, Office of Naval
Research, Environmental Protection Agency)

Each of these meetings brought together a group of
distinguished scientists and decision makers. The
products of last year's workshops include two books, one
published and one in press.

Schubel, J. R. and B. C. Marcy, Jr. (eds.).
1978. Power Plant Entrainment: A Biological

Bowman, M. J. and W. E. Esaias (eds.). In
press. Oceanic Fronts in Coastal Processes.
Springer Verlag, Berlin.

Stony Brook has been selected as the site for the 1979
Annual Meeting of the American Society of Limnology
and Oceanography.

- Programs of International Cooperation.

MSRC scientists, I. W. Duedall and Chano Chuecas (Visiting
Professor from University of Concepcion, Chile), received
support from the Tinker Foundation to begin work in Chile
on pollution problems in the Bay of Concepcion. They antici­
pat supplementary support from either the International
Sea Grant Program or the Office of American States. The
project will begin this summer.

Blair Kinsman and J. R. Schubel visited the Universidad
Nacional de Autonoma, Mexico City, to initiate cooperative
research programs in three areas: inlet stabilization,
power plant siting and assessment, and disposal of calcium
sulfate wastes in the marine environment. Proposals for
support have been submitted to the Ford Foundation, the
International Sea Grant Program, and the National Science
Foundation. The initial support came from the Office of
Education through a grant to Professor Raymond Jones.
Education

- MSRC's Doctoral Program in Coastal Oceanography Approved by State Education Department

On 21 April 1978 the Board of Trustees of the State Education Department approved MSRC's plan to offer the degree of Doctor of Philosophy in Coastal Oceanography. This extends the Center's present Master's degree program to the full range of graduate study.

We anticipate great advantages from the expanded program. For the master's level students, the presence of a group of more mature scholars who are nearing the highest professional level and who can mediate between them and MSRC's professional research activities will stimulate and enrich their educational experience. The Ph.D. candidates will be a source of stimulation for their professors and will be capable of substantial research with only minimal supervision. SUNY will offer, for the first time, a complete professional training in coastal oceanography. The addition of more advanced students will make the MSRC better able to respond to the needs of the State, and the State will be able to draw on the knowledge of a growing corps of oceanographers trained on and familiar with its own waters.

- Jessie Smith Noyes Fellowship Program.

The MSRC's Jessie Smith Noyes Fellowship Program has been established as a prestigious program for students in the marine sciences. Noyes Fellowships are used to support outstanding young scholars working on important environmental problems of the coastal zone. The stipends are the highest at SUNY. This year the program supported, in full, three pre-doctoral fellows—David Hirschberg, Dominick Ninivaggi, and Wayne Penello. Mr. Hirschberg is assessing the effects of floods on the sedimentation of the upper Chesapeake Bay and has received other awards to support his research from the Society of Sigma Xi and the National Science Foundation. Mr. Penello is determining the role of rooted aquatic plants in mobilizing trace metals from deposits of natural sediments and dredged materials. He has also received an award from the Society of Sigma Xi. Mr. Ninivaggi is studying whether changes in the composition of phytoplankton assemblies caused by pollution have affected the feeding ability of certain zooplankton (small crustaceans) which normally feed on the phytoplankton, and in turn, are themselves food for fish.

We anticipate renewal of our Jessie Smith Noyes Fellowship program for the 1978-79 academic year and have selected three new Noyes Fellows—Monica Bricelj, Gerard Capriulo, and Kevin Wyman.
Extended Cooperation With Other SUSB Departments.

MSRC continues to build bridges to other departments at SUSB.

Ecology and Evolution

Professor Akira Okubo of MSRC is an active participant in the Department of Ecology and Evolution. All of his teaching continues to be through that department. Dr. Okubo's participation has led to the development of a new area of strength in the Department of Ecology and Evolution—Quantitative Ecology.

Professor Edward Carpenter of the MSRC who also holds a joint appointment in the Department of Ecology and Evolution recently had a proposal funded by NSF for a collaborative study with Professor Barbara Bentley of E&E.

Earth and Space Sciences

A new 5 year B.S./M.S. course of study in geological oceanography will be offered jointly by MSRC and ESS beginning this fall. The course of study is designed to attract outstanding undergraduate geology majors to geological oceanography. It couples two existing programs in an effective way to offer an exciting new opportunity to Stony Brook's students. Well prepared students can obtain a B.S. in Earth and Space Sciences and an M.S. in Marine Environmental Sciences in five years, including the two summers following the B.S.

To facilitate the program four joint appointments were established between our two departments. Professors W. Meyers and O. Schaeffer of ESS were appointed to the MSRC and Professors I. Duedall and H. Bokuniewicz of MSRC were appointed to the faculty of ESS.

Chemistry

Professor I. W. Duedall of MSRC is advising and supporting a doctoral student from the Chemistry Department at SUSB.

Physics

Professor R. E. Wilson of MSRC is advising a doctoral student from the Physics Department at SUSB.

The MESP Continues to Flourish.

The MESP had its five-year review in the spring of 1977. The review resulted in a strong endorsement of the program. Selected comments from the review include:
"The goals of the MESP are both valid and desirable: filling a need for trained personnel at the master's level in local, state and national levels."

"Individuals familiar with the basic scientific information to solve applied problems in the nearshore environment are needed. No comparable program seems to exist."

"The quality of the current program is high incorporating a proper balance between teaching in the basic disciplines and active training. Student participation in the training is high. Staff and student interaction is good. The advisory system appears to work well and the teaching staff is of high quality. The instructional staff have been receptive of student criticism of the curriculum. This has resulted in a desirable evolution of core course content. The reviewers encourage a continuation of this student-faculty dialogue."

"Graduate students generally appear complimentary of the program and faculty. The core curriculum is perceived by students as being excellent, although particularly demanding in the area of mathematics and physics. There is a constant need, which seems to be met, of this information being applied and tailored to specific situations and problems in marine biology."

The program continues to improve in quality and reputation. Students were drawn from throughout the U.S. and two foreign countries. Quality of students as measured by GRE's, grade point averages, and letters of recommendation have shown dramatic improvement over the past several years and the students now rank among SUSB's best entering graduate students. The addition of our Doctoral Program will substantially improve the MESP.

Eight students received the master's degree through the MESP in the 1977-78 academic year.
For the fall semester (1978) we expect to have a total of approximately 50 full-time students, 15 part-time students, and 30 CED students.

- Oceanography Courses for Non-specialists.

Each year MSRC offers two introductory courses in the marine sciences for non-specialists. One, Introduction to Oceanography, is given through CED. This course covers the biological, chemical, geological, and physical processes that characterize the marine environment. The second, the Marine Environment of Long Island, is offered through the summer session. This course explores the geology of Long Island and the oceanography of its surrounding waters. The physical and chemical processes that mold the environment as well as the flora and fauna are examined during field trips, cruises, laboratory exercises, and lectures.

Both courses have had particular appeal for elementary and secondary school teachers who account for more than 75% of the enrollment. Student evaluations of these courses indicate clearly that they are demanding and rewarding.

We are now designing a new one semester field course which we hope to offer for the first time in September 1979 and to repeat each fall. The course would meet on weekends and we hope attract undergraduates and interested laypeople in addition to teachers.

Service

Members of the MSRC continue to serve in key advisory roles to a variety of international, Federal, state, county, and local environmental agencies. Many of these affiliations are listed in Part I of this report. This is a responsibility MSRC takes very seriously.

A CLOSING COMMENT

In last year's annual report we pointed out that one of the goals for the present year was "the development and enhancement of the State's perception of MSRC as a resource, a problem solver, that it can and should turn to for assistance in resolving its coastal marine problems." We went on to point out in that report that this would not be an easy task. And indeed it has not been easy, but major strides have been made. A variety of State and local agencies are turning with increasing frequency to MSRC for guidance in resolving important societal problems of the coastal ocean. These agencies include: the Department of Environmental Conservation, the Office of General Services, the N.Y. Energy Research and Development Authority, the Public Service Commission, the Power Authority of State of New York, the Suffolk County Department of Health, the Brookhaven Board of Environmental Protection, the Nassau Suffolk Regional Planning Board,
and others. This closer coupling of MSRC to State environmental management and protection agencies is one of the most encouraging things to have happened to MSRC.

**Specific goals for next year include:**

1. Development of our new doctoral program into one of extremely high quality and effectiveness.

2. Development of a program with private support to provide 2-3 positions for postdoctoral scholars.

3. Development of our MSRC Associates program to provide flexible support for the Center of at least $10,000/yr.

4. Addition of one more faculty member to MSRC through the I. & D.R. budget.

5. Development of more effective mechanisms for fulfilling our mandate as the SUNY-wide Center for research, graduate education, and public services in the marine sciences.

6. Acquisition and rehabilitation of the Department of Environmental Conservation's Flax Pond Laboratory.

7. Acquisition of a 20-25 foot trailerable boat with cabin for use in Great South Bay.

We are dependent entirely upon the SUSB administration for attainment of goal #4, and the SUNY Central and SUSB administration for #6. We will need your assistance on 1 and 5. With your continued support, a little luck, and a lot of work we will attain all of these goals and others.
Appendix A

Annual Report for 1977-78

Marine Sciences Research Center

DEPARTMENTAL ACTIVITIES

Departmental Colloquia and Seminars

October 6, 1977
Dr. Gurdial Mal Sharma, New York Ocean Science Laboratory
"New Methods for Determination of Trace Metals and Vitamins in Seawater"

October 13, 1977
Dr. Robert Armstrong, SUNY, Stony Brook
"Predator/prey Relationships"

October 18, 1977
Dr. M. Uda, Tokai University, Japan
"Problems of Frontal Oceanography with Applications to Fisheries, Weather Prediction, Energy Use, Sound and Light Transmission"

October 20, 1977
Dr. Robert Byrne, Virginia Institute of Marine Science
"Stability of Barrier Island Inlets"

October 27, 1977
Mr. Stuart Buckner, Town of Islip
"Management Plan for Great South Bay Hard Clam Resource"

November 3, 1977
Dr. Jay Heinbokel, Chesapeake Bay Institute
"Functional and Numerical Responses of Tintinnids: Implications for the Neritic Food Chain"

November 9, 1977
Dr. Ken Perez, E.P.A. Water Quality Laboratory
"Microcosm Modelling of Narragansett Bay Ecosystem"

November 17, 1977
Dr. Bud Brinkhuis, Marine Sciences Research Center
"Uptake of Heavy Metals by Eelgrass in Great South Bay"
<table>
<thead>
<tr>
<th>Date</th>
<th>Speaker and Institution</th>
<th>Topic</th>
</tr>
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<tbody>
<tr>
<td>December 1, 1977</td>
<td>Dr. Malcolm Bowman, Marine Sciences Research Center</td>
<td>&quot;Recent Developments in Coastal Frontology&quot;</td>
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<tr>
<td>December 8, 1977</td>
<td>Dr. Grace Brush, Maryland Department of Natural Resources</td>
<td>&quot;Biostratigraphy of Chesapeake Bay Tributaries&quot;</td>
</tr>
<tr>
<td>December 15, 1977</td>
<td>Dr. Hank Bokuniewicz, Marine Sciences Research Center</td>
<td>&quot;Sedimentary Processes in Long Island Sound&quot;</td>
</tr>
<tr>
<td>February 6, 1978</td>
<td>Dr. Peter K. Weyl, Marine Sciences Research Center</td>
<td>&quot;What is Management?&quot;</td>
</tr>
<tr>
<td>February 27, 1978</td>
<td>Dr. Clarissa Yentsch, Bigelow Oceanographic Laboratory</td>
<td>&quot;Two Mechanisms of Red-Tide Toxin Accumulation in Shellfish in New England Waters&quot;</td>
</tr>
<tr>
<td>March 6, 1978</td>
<td>Dr. Harold Haskin, Rutgers University</td>
<td>&quot;Shellfish Resource Problems in the State of New Jersey&quot;</td>
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<tr>
<td>March 13, 1978</td>
<td>Ms. Nancy Goell, Group for America's South Fork</td>
<td>&quot;Resource and Land Use on the South Fork of Long Island&quot;</td>
</tr>
<tr>
<td>April 3, 1978</td>
<td>Dr. William Boicourt, Chesapeake Bay Institute</td>
<td>&quot;Three Dimensional Circulations&quot;</td>
</tr>
<tr>
<td>April 4, 1978</td>
<td>Dr. Robert B. Gordon, Yale University and Dr. H. J. Bokuniewicz, Marine Sciences Research Center</td>
<td>&quot;Long Island Sound Sediment System&quot;</td>
</tr>
</tbody>
</table>
April 4, 1978  Dr. Donald W. Pritchard, Chesapeake Bay Institute
"Esteros"

"Sediment Transport in the Amazon"

April 10, 1978  Dr. Thomas Donnelly, SUNY, Binghamton
"Chemistry of Pelagic Marine Sediments"

April 24, 1978  Dr. John E. Hobbie, Massachusetts Marine Biological Laboratory
"Ecology of Bacteria in Aquatic Ecosystems"

May 8, 1978  Dr. P. A. Buckley, National Park Service
"Master Planning Constraints on Fire Island, N.Y."

Student Seminars: A Requirement for the Master's Degree

January 30, 1978  D. Scott Becker
"Evaluation of a Hard Clam Spawner Transplant Site Using a Dye Tracer Technique"

February 13, 1978  Chris Tuthill
"Growth of Some German and North African Salt Marsh Plant Species in Relation to Ground Compaction"

February 20, 1978  Gregory Greene
"Population Structure, Growth and Mortality of Hard Clams at Selected Locations in Great South Bay, N.Y."

March 20, 1978  Andrew Mirchel
"Enforcement in the Hard Clam Fishery of New York"

March 27, 1978  Monteith Heaton
"Chemical Aspects of Hydraulic Dredging and Open-Water Pipeline Disposal in Estuaries"
April 17, 1978  Christopher Smith
"Hard Clam Management--A Beginning"

May 1, 1978  William Behrens
"Depuration of Heavy Metals by Hard Clams"

May 15, 1978  David Hirschberg
"Geochemical Implications of Episodic Sedimentation in Upper Chesapeake Bay"