

VIRUSES, BUBBLES, AND THEIR TRANSFER FROM SURF TO WIND

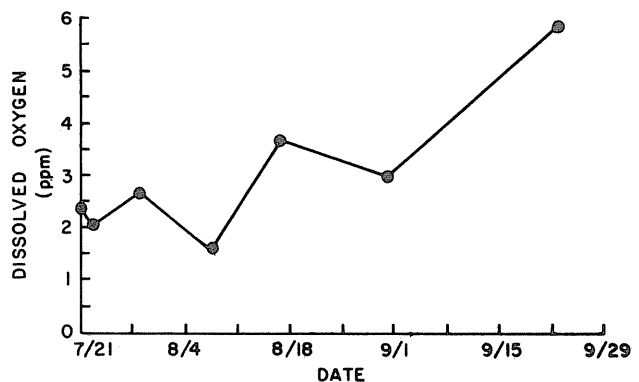
Professors E. R. BAYLOR, M. B. BAYLOR, and V. PETERS of the MSRC in cooperation with their colleagues from the Woods Hole Oceanographic Institution and the Atmospheric Science Research Center (ASRC) of SUNY, Albany are determining whether viruses in sea water can be lofted into the wind as aerosol particles created by bursting bubbles in white caps or in the surf. This novel notion is not a new one but is attributable to Alfred H. Woodcock who in the early days of the Woods Hole Oceanographic Institution suggested that aeration of sewage produced microbe-laden aerosols. Subsequent studies all confirmed Woodcock's hypothesis. Recently, Professor Duncan C. Blanchard of SUNY Albany, a Woods Hole colleague of Woodcock's, has shown how microbes adsorb to bubbles rising through water and how the skin of the bubble is converted to aerosol droplets containing microbes when the bubble bursts. These aerosol droplets were studied with the electron microscope by Virginia Peters, Martha Baylor and Ted Baylor and their results substantiating those of Blanchard appear in a recent issue of *Science*.

In a second article of *Science*, MSRC personnel and their colleagues from the ASRC report a study showing that harmless coliform viruses injected into the surf were lofted from the surf to the wind in astonishing numbers. The viruses employed in their study were genetically distinguishable from similar wild viruses and had an extreme sensitivity to ultraviolet radiation. The latter precaution assured that all wind-borne viruses would be dead before they were 1/4 mile down wind from the beach. A network of collecting

stations on the beach showed a logarithmic decrease in the virus fallout on the beach with viruses detected as far as 100 feet from the beach. This work addresses two problems in the New York Bight: ocean dumping of sewage sludge and the summer-time reversal of the Hudson River plume from the Jersey shore to the shore of Fire Island where it brings and leaves on the beach millions of human cultural artifacts commonly associated with sewage.

LOW OXYGEN IN L.I. SOUND

This past summer was one of the hottest on record. As a result, the recreational use of the waters of Long Island Sound also increased. The heat that drives people to the beaches also adversely affects the level of dissolved oxygen in the deeper waters of the western Sound. To document the dissolved oxygen levels under the extreme conditions of last summer, the Marine Sciences Research Center carried out a number of cruises aboard the R/V ONRUST. The first cruise took place on the hottest day of the year and the cruises were continued roughly biweekly until conditions improved. The graph below shows the level of dissolved oxygen in the Sound north of Hempstead Harbor. The dissolved oxygen level fell to below 2 parts per million (ppm) in August and recovered to acceptable levels (above 5 ppm) by mid-September. The work was carried out by PETER K. WEYL, IVER DUEDALL and JOHN ZIMMERMAN. An MSRC Special Report is being prepared.



PEOPLE AND MEETINGS

Professor MALCOLM J. BOWMAN presented a lecture on the theory of caballing dynamics within oceanic fronts at the Chapman Conference on Oceanic Fronts, New Orleans, October 11-13, 1977. Also at the annual workshop on physical oceanography of the Middle Atlantic Bight at Lamont Doherty Geological Observatory, Palisades, N.Y. on November 15 and 16, 1977 he made an oral presentation on "Spreading and mixing of the Hudson River effluent into the New York Bight."

Professor J. R. SCHUBEL and Jessie Smith Noyes Fellow DAVID HIRSCHBERG presented an invited paper entitled "Estuarine Graveyards and Climatic Change" at the fourth Biennial International Estuarine Research Conference. Dr. Schubel was the leader of the scientific sessions for the workshop to identify and assess alternatives for the disposal of materials dredged from the New York District of the U.S. Army Corps of Engineers. The workshop which was sponsored by the U.S. Army Corps of Engineers and coordinated by the Mitre Corporation was held in New York City from 11-13 October 1977. W. M. WISE also participated in the workshop.

P. K. WEYL, W. M. WISE, and J. R. SCHUBEL conducted a workshop with support from the Maryland Department of Natural Resources and the U.S. Environmental Protection Agency as part of their contract to develop a dredged material management plan for the Maryland portion of the Chesapeake Bay. The workshop was held at the University of Maryland's Donaldson Brown Conference Center near Port Deposit (MD) on 31 October, 1, 2 November 1977.

Professor I. W. DUEDALL presented an invited paper entitled "Composition, Distribution and Transport of Particulate Material in the New York Bight Apex" at the Fourth Biennial International Estuarine Research Conference held at Mount Pocono (PA) on 2-5 October 1977. The paper was co-authored by Professor R. DAYAL (MSRC) and K. W. JONES and H. W. KRANEN of the Brookhaven National Laboratory.

Professor AKIRA OKUBO presented an invited paper entitled "Horizontal Dispersion and Critical Scales for Phytoplankton Patchiness" at the NATO School on "Spatial Patterns in Plankton Communities" held at Erice, Sicily, from 13-21 November 1977.

Professor J. L. McHUGH presented an invited paper entitled "Atlantic Sea Clam Fishery: A Case History" at the North Carolina Governor's Conference on Fishery Management under Extended Jurisdiction, 11-12 October, in Raleigh, North Carolina. Dr. McHugh also attended a joint meeting of the Mid-Atlantic and New England Fishery Management Councils 19-20 October at Woods Hole, Massachusetts. He partici-

pated in the November meeting of the Mid-Atlantic Fishery Management Council on 9-10 November in Dover, Delaware, and in a public hearing on conflicts between fixed and moving fishing gears at Southampton, Long Island, on 17 November.

AWARDS

Professors MALCOLM BOWMAN and WAYNE ESAIAS have received \$62,500 from the National Science Foundation for a one year international study to investigate the effects of tidal stirring in shallow seas on the formation of fronts and the distribution of plankton. The field work is designed to study frontal structures and their biological significance in three areas of widely varying characteristics, one inside a major estuary (Long Island Sound), the second on the continental shelf (northwest coast of France) and the third near a large headland (north coast of Wales, U.K.). The European portion of the research will be conducted in collaboration with Drs. ROBIN PINGREE of the Institute of Oceanographic Sciences and JOHN SIMPSON of the University College of North Wales, two leading authorities on coastal fronts.

Professor WAYNE E. ESAIAS will continue his studies of the processes of primary productivity on the continental shelf south of Long Island on a renewal of his grant from the Brookhaven National Laboratory. Dr. Esaias will concentrate on space/time factors affecting the distribution of plankton. An important tool for his research is a towed underwater fluorometer system developed at MSRC.

Professor RAMESH DAYAL received an award from EPA for sediment geochemical studies of nuclear waste disposal subsites in the Pacific Ocean. He will be assessing the processes by which radioactive materials released to interstitial waters may be transported to the overlying water column. The project is a counterpart of a similar study Dr. Dayal recently completed on Atlantic Ocean nuclear waste disposal sites.

Professor ROBERT E. MALOUF, who recently joined the Center's faculty, has been granted supporting funds from the New York Sea Grant Institute to establish and equip a shellfish biology laboratory. Much of his research will be conducted at the Environmental Conservation Department's Flax Pond Laboratory under a cooperative arrangement with the Stony Brook campus.

MESP STUDENT AWARDED GRADUATE COUNCIL FELLOWSHIP

Congratulations to KENNETH P. KURKOWSKI on being awarded a Graduate Council Fellowship for the 1977-78 academic year. Kenneth received his B.S. in biology last May from St. John's University, N.Y. and is a graduate student in our Marine Environmental Sciences Program.

SOME RECENT PUBLICATIONS

- BAYLOR, E. R., M. B. BAYLOR, D. C. BLANCHARD, L. D. SYZDEK, and C. APPEL. 1977. Virus transfer from surf to wind. *Science* 198:575-580.
- BOWMAN, M. J. 1977. Nutrient distributions and transport in Long Island Sound. *Estuarine and Coastal Marine Science* 5:531-548.
- BURRELL, D. C. and J. R. SCHUBEL. 1976. Seagrass system oceanography. Pages 195-232 in Peter McRoy and Carla Helfferich, eds. *Seagrass ecosystems, a scientific perspective*. Marcel Dekker, Inc., N.Y.
- CARTER, H. H., J. R. Schubel, R. E. WILSON and P. M. J. WOODHEAD. 1977. A rationale for evaluating thermally induced biological effects due to once-through cooling systems. MSRC Special Report 7. 65 p.
- GREENE, G. T. and D. S. BECKER. 1977. Winterkill of Hard Clams in Great South Bay, N.Y. 1976-77. MSRC Special Report 9. 23 p.
- McHUGH, J. L. 1977. Ocean fishery management: A new era. Trans. Delaware Fisheries seminar, March 23, 1977, Ashland Nature Center of the Delaware Nature Education Society, Hockessin, Delaware:54-55.
- SCHUBEL, J. R., H. H. CARTER, and W. B. CRONIN. 1976. Effects of Agnes on the distribution of salinity along the main axis of the Bay and in contiguous shelf waters. Pages 33-54 in J. Davis and B. Laird, eds. *The Effects of Tropical Storm Agnes on the Chesapeake Bay Estuarine System*. The Johns Hopkins University Press, Balto.
- SCHUBEL, J. R. 1976. Effects of Agnes on the suspended sediment of the Chesapeake Bay and the contiguous shelf waters. Pages 179-200 in J. Davis and B. Laird, eds. *The Effects of Tropical Storm Agnes on the Chesapeake Bay Estuarine System*. The Johns Hopkins University Press, Balto.

MSRC ASSOCIATES

The MSRC Associates was established in 1976 to assist the Center in attaining its goals in research, education, and public service. While the Marine Sciences Research Center is generously supported by the State University system and receives substantial funds for specific research from Federal, State, and County agencies and from private institutions, such support is normally committed to pre-arranged ends and takes a long time to secure. The funding structure can not respond rapidly to opportunities. The support of the Associates gives the Center

the flexibility to act when action is needed.

Interdisciplinary research is another area in which the Associates help. Such work, while often promising, frequently "falls between the cracks" of established categories. The uncommitted support of the Associates can change a "nice idea" into solid knowledge.

Associates can encourage student excellence by providing funds for fellowships and awards to honor outstanding work. Their uncommitted funds can be used to publish research in forms useful to the general community, a form of scientific publication not now well provided for by established channels. New research can be started while the long process of securing funds from other sources is underway and needed specialized equipment provided which would be otherwise unobtainable.

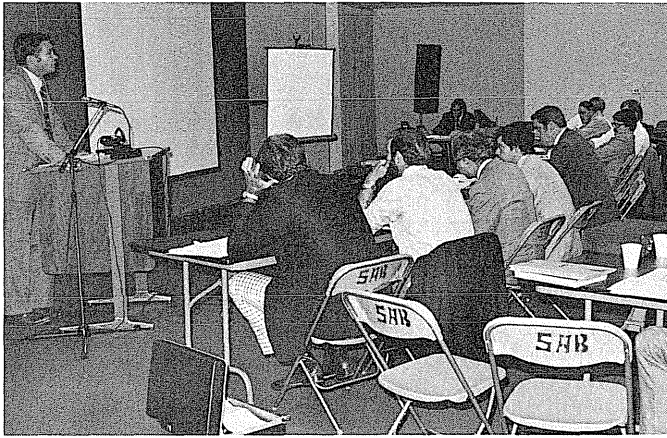
While the contribution of the Associates may seem modest in comparison with the total budget of the Center, being uncommitted, it is the sole source of the flexibility that provides the cutting edge any research center must have to become and remain great.

We welcome Mr. and Mrs. Ted H. Schubel, Port Austin, Michigan, as new Associates. We are delighted that Mr. William Swan, Quogue, New York, our first MSRC Associate, has renewed his membership for another year.

Contact Mrs. Jeri Schoof at (516) 246-6543 for information concerning individual and organizational memberships. All contributions are tax deductible and will be used to support the Center's educational, research and public service programs.



Jessie Smith Noyes Fellow, WAYNE F. PENELLO, examines a short core of sediment he has collected from Great South Bay. Mr. Penello is working with Professor B. H. BRINKHUIS to assess the mobilization of metals by rooted aquatic plants used to stabilize deposits of dredged materials.



Peter Berle, Commissioner of the N.Y. State Department of Environmental Conservation, presents the luncheon address.

MSRC HOSTS NEW YORK STATE ENERGY RESEARCH AND DEVELOPMENT AUTHORITY SYMPOSIUM

On 28-29 September 1977 the MSRC hosted a symposium for the New York State Energy Research and Development Authority (NYSERDA). The symposium entitled "Power Generation and the Aquatic Environment" brought together all of NYSERDA's contractors working on aquatic problems with representatives of industry, academia, and a variety of State and Federal management and conservation agencies. The first day was devoted to formal presentations by each of NYSERDA's major contractors; the second day to informal workshop sessions. The formal papers are listed below:

Power Plant Condenser Tube Simulator: Entrainment Effects on Fish and Invertebrates.--Joseph O'Connor, New York University.

Aerial Remote Sensing for Determination of Surface Water Temperature and Water Quality Variables.--John Schott, Calspan Corp.

Prediction of Subsurface Water Temperatures from Surface Water Temperature Measurements.--Joseph Cataldo, Cooper Union.

Evaluation of the Biological Effects of Thermal Discharge Entrainment.--Harry Carter, J. R. Schubel, R. E. Wilson, P. M. J. Woodhead, MSRC.

Multifarious Power Plant Water Intake Structure: A Design to Reduce Impingement and Entrainment Mortality.--Alvin Goodman, Polytechnic Institute of New York.

Selecting a ΔT to Minimize Entrainment Mortality.--Blair Kinsman, MSRC.

The symposium was coordinated by Jeri Schoof (MSRC) and Bart Chezar (NYSERDA). The proceedings of the symposium are available from MSRC.

NEWS ABOUT MSRC GRADUATES

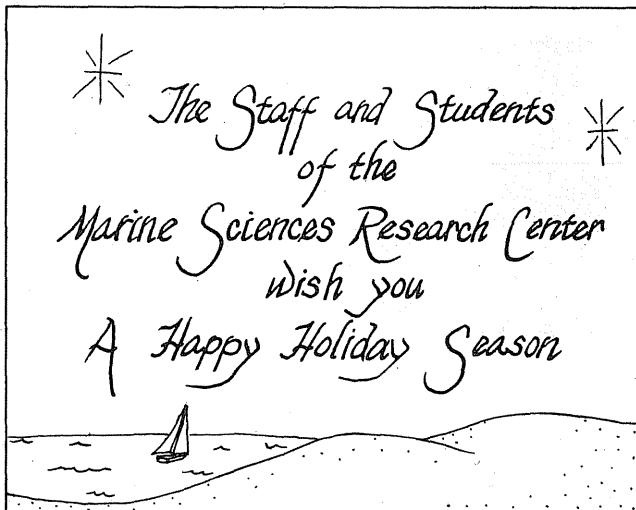
PAUL MOSKOWITZ (MESP, 1972) accepted a position with the Environmental Policy Analysis Office of Brookhaven National Laboratory.

SETH LOW (MESP, 1973) received his law degree, J.D., from Louisiana State University in May 1977.

JAY GINTER (MESP, 1974) is studying for an advanced degree in fisheries management and ocean resources policy in the Institute for Marine Studies, University of Washington in Seattle.

ANNE D. WILLIAMS (MESP, 1975) has accepted the position of Fishery Statistician with the Mid-Atlantic Regional Fishery Management Council.

JOE SALVO (MESP, 1976) accepted a position as an environmental scientist with the New York Public Interest Research Group.



Stony Brook, New York 11794

NON-PROFIT ORG.
U.S. POSTAGE
PAID
STONY BROOK, N.Y.
PERMIT No. 65