



NOAA WEEK

U.S. DEPARTMENT OF COMMERCE National Oceanic and Atmospheric Administration

Storm Surge Forecasting Technique Tested by NWS



Storm surge damage at Virginia Beach, Va., following a disastrous extratropical storm in March 1962.

The Techniques Development Laboratory of the National Weather Service's Systems Development Office has developed an automated technique for forecasting extratropical storm surges along the northeast coast of the United States. The storm surge is the abnormal rise of water level above astronomical tide level caused by strong winds associated with extratropical storms over nearshore areas. Surges from this type of storm damage parts of the northeast coast on the average about six times each winter season.

Empirical forecast equations have been derived for the following eight locations: Portland, Me.; Boston, Mass.; Newport, R.I.; New York, N.Y.; Atlantic City, N.J.; Breakwater Harbor, Del.; Baltimore, Md.; and Norfolk, Va. These equations were derived using data from 68 storm surges which occurred from 1956 through 1969. Input data to these forecast equations are sea-level pressure values as forecast by the Primitive Equation Model of the National Meteorological Center.

The forecast method was put into operation on October 27 on an experimental basis. Forecasts are transmitted to East Coast stations via teletypewriter (Circuit 7072) and consist of values projected out to 36 hours at six-hour intervals. These projections are used by NWS marine forecasters as guidance in preparing the actual storm surge predictions.

Dr. Townsend Receives NASA's Highest Award



A NASA Photo
Dr. Townsend receiving certificate of award from Dr. George Low, Assistant Administrator of NASA

Dr. John W. Townsend, Jr., Associate Administrator of NOAA, received the National Aeronautics and Space Administration's Distinguished Service Medal in the space agency's 1971 honor awards ceremony on October 29. The medal, NASA's highest award, was presented to Dr. Townsend "for distinguished service, unselfishly rendered, in the conduct of the Nation's program for the exploration, scientific investigation, and peaceful utilization of space for the benefit of all mankind." Of the six medal winners this year, Dr. Townsend was the only non-NASA employee. He has been associated with the Nation's space program since its inception.

Among the other honors Dr. Townsend has received are the Navy's Meritorious Civilian Service Award, 1957; the NASA Medal for Outstanding Leadership, 1962; and the Arthur S. Flemming Award as one of the Ten Outstanding Young Men in the Federal Service, 1963.

NOAA Participates in Centennial Of Canadian Weather Service

The Atmospheric Environment Service of Canada (formerly the Canadian Meteorological Service) celebrated its one hundredth anniversary last week with a three-day international scientific symposium on "A History of Meteorological Challenges" and by officially opening its new headquarters building in Toronto.

Dr. Richard E. Hallgren, NOAA's Associate Administrator for Environmental Monitoring and Prediction, spoke at the final session of the symposium, and Dr. George P. Cressman, Director of the National Weather Service, and Dr. Joseph H. Smagorinsky, Director of ERL's Geophysical Fluid Dynamics Laboratory in Princeton, N. J., spoke at other sessions.

Dr. Cressman presented a plaque on behalf of the NWS to J. R. H. Noble, Assistant Deputy Minister of Canada's Department of Environment, who also heads the Atmospheric Environment Service, in appreciation of 100 years of service and fruitful collaboration.

Similar plaques were presented by the Canadians to Dr. Hallgren, accepting on behalf of Dr. Robert M. White, NOAA Administrator; to Dr. Cressman for the NWS; and to Dr. Frederick G. Shuman, Director, for the National Meteorological Center, in recognition of the long and friendly cooperation between the respective Services.

Other NOAA men who attended the centennial were: William H. Haggard, Director, National Climatic Center (EDS-Asheville, N. C.); Dr. Sigmund Fritz, Chief Space Scientist, National Environmental Satellite Service (Suitland, Md.); Norman L. Canfield, Eastern Regional Climatologist (NWS-Garden City, N.Y.); Vaughn D. Rockney, Chief, Overseas Operations Division; Max A. Kohler, Director, Hydrologic Research and Development Laboratory; Harold A. Bredient, Chief, Data Automation Division; and Dr. William H. Klein, Director, Techniques Development Laboratory (NWS-Silver Spring, Md.).

Three Airport Surveys Completed

National Ocean Survey airport survey parties have recently completed surveys of airports in Michigan, New York, and Washington.

Donald C. Suva's party surveyed Muskegon (Mich.) County Airport; William M. Reynolds' party surveyed Warren County Airport at Glens Falls, N.Y.; and Paul D. Crabtree's party surveyed William R. Fairchild International Airport at Port Angeles, Wash.

William E. Jones Is Presented Commerce Bronze Medal



Mr. Jones (left) and Mr. Gleiter

Shown above receiving his Bronze Medal Award from Theodore P. Gleiter, NOAA's Assistant Administrator for Administration, is William E. Jones, Chief of the Presentation Arts Section of the Administrative Operations Division. Mr. Jones was cited "for many years of outstanding performance in the development and management of programs in the fields of cartography and scientific illustrating."

Awards Night Reminder

The first annual NOAA Awards Night Dinner Dance is less than a month away. Time to get your tickets from the ticket sellers listed in last week's issue, and to make table reservations by calling Mary Gearhart, 496-8134, or Mary Moore, 496-8347.

To be held Friday, December 3, at Indian Spring Country Club, Silver Spring, Md., the most gala NOAA event of the year begins with a cocktail hour, continues with dinner featuring roast prime ribs of beef and--after a brief ceremony honoring the 1971 winners of NOAA's \$1,000 awards and special unit citations--concludes with three hours of dancing.

Tickets are \$12.50 per person, and free parking is included.

Simple Seismic Instrument Gives Sophisticated View of Earthquakes

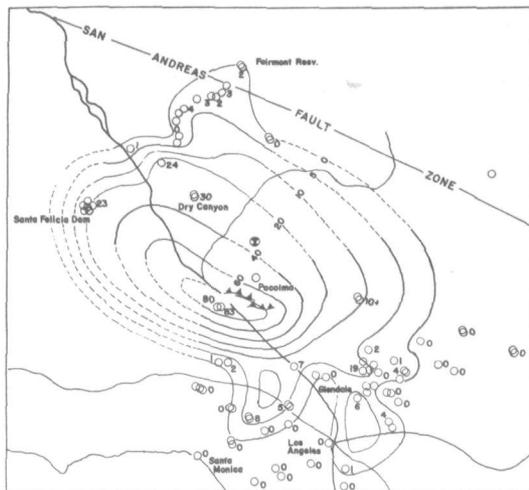
The more our scientific instruments teach us about earthquakes, the more earthquakes teach us about our instruments.

This is one lesson NOAA seismologists are learning from the February 9, 1971, earthquake in California's San Fernando Valley.

Strong-motion records from that catastrophic tremor indicate that an inexpensive, simple instrument called a seismoscope provides a much more sophisticated view of earthquake motions than it was designed to give--and that it does this partly by "malfunctioning" during an earthquake.

ERL seismologist B. Jerry Morrill reports that careful analysis of more than 150 seismoscope records for February 9--the most ever obtained for a single earthquake--suggests the devices can be used to obtain certain time-based data, and information relating to vertical motion during an earthquake.

They were designed to do neither. They were designed to provide an inexpensive, general record of horizontal motion during earthquakes. The device scratches its record with a stylus on a pendulum-driven smoked watch glass, producing what looks like a drawing by a two-year-old child. The instrument was intended to supplement the more elaborate data obtained by strong-motion accelerographs, but interpretation of seismoscope data obtained during the San Fernando earthquake gives evidence that the instruments do more than that.



Skips in the seismoscope records are a relative measure of vertical motions produced by the tremor

Some records, for example, show a relatively high-frequency oscillation in the seismoscope records following the abrupt changes in trace direction which mark high horizontal accelerations. The oscillation is caused by a parasitic vibration of the pendulum suspension. Knowing the frequency of the parasitic vibration, the seismologist can use these extraneous oscillations as a time scale.

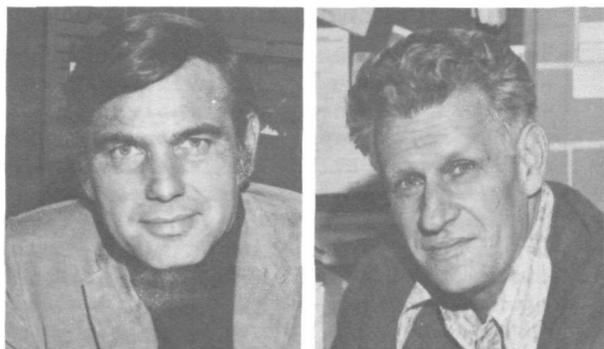
Another "poor" performance characteristic of the seismoscope provides vertical motion data. The strong vertical accelerations of the San Fernando earthquake caused the points of seismoscope styli to lift off the smoked glass, causing skips in the record--more than 75 skips on some. The overall picture of such motion for the earthquake area turns out to match the view obtained through extensive interviews of those who experienced the earthquake.

By plotting the seismoscope skips on a Los Angeles area map, Morrill found that the 70-or-more-skip zone encompassed the area of heaviest damage, where post-earthquake reconnaissance showed surface ground breaks, shattered earth, and evidence that buildings, sidewalks, and vehicles had been thrown vertically into the air by earth motions. Although interpretation of the new type of map is incomplete, Mr. Morrill suggests that it may provide instrumental support, not otherwise available, for the hypothesis that with thrust faulting (as in the case of the San Fernando earthquake) the vertical acceleration falls off very rapidly with distance on the down side of the fault and more slowly on the up side.



Seismoscope record at Santa Felicia Dam Crest, during the San Fernando earthquake of February 9, 1971

North Atlantic Fisheries Center, Anchorage WFO Heads Named



Richard C. Hennemuth Dr. Robert L. Edwards

Dr. Robert L. Edwards, former NMFS acting associate director for resource research, has been named Director of the North Atlantic Fisheries Research Center, headquartered at Woods Hole, Mass., and Richard C. Hennemuth, former director of the NMFS Biometrics Institute at Woods Hole, has been named Deputy Director.

The North Atlantic Fisheries Research Center, an offshore center, will coordinate the work of the NMFS Biological Laboratory and the Exploratory Fishing and Gear Research Base at Woods Hole, the Narragansett, R.I., Marine Gamefish Research Laboratory, and the Biological Research Laboratory at West Boothbay Harbor, Maine.

A former assistant director of the Woods Hole laboratory, Dr. Edwards was responsible for scientific leadership and technical coordination of research programs in the northwest Atlantic. In 1967, 1968, and 1969, he coordinated the scientific visits of Soviet research vessels that worked with U.S. vessels gathering data that led to an international agreement to conserve U. S. coastal fishery resources.

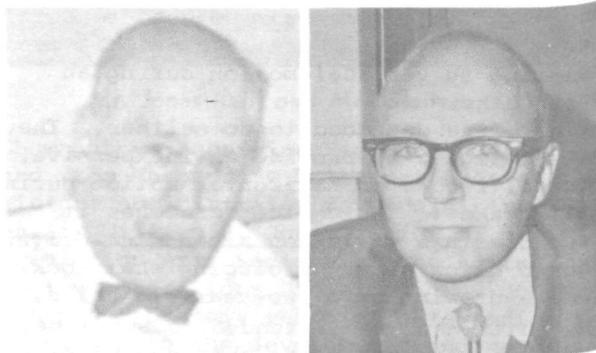
In 1970, he was assigned to the Washington office of the Bureau of Commercial Fisheries and following its incorporation in NOAA, he was named acting associate director of NMFS for resource research. He will continue to perform the duties of this position, also, until a new associate director is appointed.

Dr. Edwards received his bachelor of science degree from Colgate, and both his master's and Ph.D. from Harvard.

Before joining the fisheries agency in 1960, Mr. Hennemuth served for six years as a scientist with the Inter-American Tropical Tuna Commission, and is known for his studies that provided the basis for catch limitations recommended by the Commission.

He has also worked with the assessments subcommittee of the International Commission for Northwest Atlantic Fisheries, whose work has led to serious consideration of more effective control of fisheries in the northwest Atlantic, and to adoption of catch limitations for haddock and yellow-tail flounder on Georges Bank and Browns Bank.

Mr. Hennemuth holds a bachelor's degree in biology from Gustavus Adolphus College and a master's from Iowa State College, and has done graduate work in mathematics at San Diego State College, in oceanography at the Scripps Institution of Oceanography, University of California, and in statistics at Harvard, where he has completed the course requirements for a Ph.D.



G. Philip Weber Dr. Edward D. Diemer

Upon the retirement of G. Philip Weber on October 16, after 30 years of government service, Dr. Edward D. Diemer became Meteorologist in Charge of the Anchorage (Alaska) NWS Forecast Office. Before this assignment, Dr. Diemer was Chief of the Anchorage Regional Headquarters Scientific Services Division.

After serving in the Air Force as a Weather Officer, he joined the National Weather Service at St. Louis, Mo. Prior to going to Alaska in 1966, he was in the Scientific Services Division of the NWS Regional Headquarters at Salt Lake City, Utah. He received his Ph. D. from the University of St. Louis.

Mr. Weber, who had served 19 years in Anchorage, had been MIC since 1964. He started with the Weather Service in Raleigh, N.C., in 1946, after spending four years in the Air Weather Service. In 1947 he was made officer in charge at Vicksburg, Miss., where he remained until 1952, when he went to Anchorage as a research meteorologist. He received a bronze medal at his retirement ceremony.

He plans to reside at 17006 Talbot Park Road in Edmonds, Wash. 98020.

Cdr. Morrill To Direct Data Buoy; Capt. Rinehart Stays With NOAA



A NASA Photo

Commander Peter A. Morrill (left), Deputy Director of the National Data Buoy Center, is shown receiving notification of his new assignment as Acting Director of the Center from Captain Virgil W. Rinehart, retiring Director.

Cdr. Morrill, who has served in the Coast Guard since graduating from the Coast Guard Academy in 1952, has been the senior representative of NOAA's Data Buoy Center since establishment of NOAA in October 1970. His other assignments have included that as Chief, Requirements Division, on the National Data Buoy Development Project; executive officer aboard a Coast Guard Cutter; Oceanographic Field Chief, International Ice Patrol, Woods Hole, Mass., and as instructor in oceanography, meteorology and navigation at the Coast Guard Academy.

Captain Rinehart will remain with NOAA as a member of the Research Group on the staff of Dr. John W. Townsend, Jr., NOAA's Associate Administrator. In his new position, Captain Rinehart's responsibilities will be in the area of coordination of technology programs within NOAA and with other Federal Agencies and technology groups.

Ships' Operations for Year Completed

Five vessels of NOAA's Atlantic fleet have completed their operations for the year. They are the PEIRCE, WHITING, FERREL, and MT MITCHELL, based at the Atlantic Marine Center, Norfolk, Va., and the DISCOVERER, based at the Ship Base, Miami, Fla. Operations are being continued by the Miami-based RESEARCHER in the area between Barbados and the submerged Mid-Atlantic Ridge and by the Norfolk-based RUDE and HECK at the Galveston (Tex.) harbor entrance.

Information Dissemination Experiment Underway in EDS

Approximately 80 NOAA scientists are participating in an EDS Selective Dissemination of Information (SDI) experiment designed to provide current bibliographic listings of scientific and technical publications tailored to the subject interests of each participating scientist. The Technical Information Division of EDS' Environmental Science Information Center is conducting the experiment, which began in September and will run for one year.

Selective dissemination of information is a relatively new method of providing reference bibliographies in support of research. It combines the convenience of abstract journals and the speed of computer searches. SDI files are established by entering bibliographic data into a computer. Searches for machine-readable bibliographic data dealing with a specific subject, i.e., continental drift, are conducted by comparing search terms related to the subject with terms appearing in the bibliographic entries of the SDI files. The search results consist of computer-printed bibliographic lists of publications related to the specific subject requested by the scientists.

The SDI searches for the experiment are being made by agencies outside NOAA, both government and non-government. The searches are being conducted in ten data files: Chemical Abstracts Condensates; Biological Abstracts; Bibliography and Index of Geology (GEOREF); Engineering Index, Compendex; Selected Physics Information Notices; Nuclear Science Abstracts; Selected Water Resources Abstracts; Air Pollution Abstracts; Selected Current Aerospace Notices; and National Technical Information Service Government Reports Announcements.

This experiment is one of a number of studies involved in the development of NOAA's Oceanic and Atmospheric Scientific Information System (OASIS), a literature-based information system designed to provide the most comprehensive references possible to the scientific literature and research projects and reports in the environmental disciplines. When it becomes fully operational, OASIS will offer SDI type services to all NOAA scientists and to the scientific community at large.

NOTES ABOUT PEOPLE

Robert Buchholz, NWS (VAP) Technical Representative, currently is in Honduras assisting with the installation of the National Communications Network. He is scheduled to complete this project around November 12, when he will proceed to El Salvador, San Salvador, to install a meteorological satellite receiving system (APT). Another NWS (VAP) Technical Representative, Charles Jones, left November 3 for Somalia, North Africa, to assist in the completion of the National Communications Network and surface observing stations. Enroute he will visit Tunis, Tunisia, for a site survey for the APT system to be installed there, and Nairobi, Kenya, to discuss communications requirements at the Nairobi Radio Telecommunication Center. He will be gone approximately six months.

Barry Fisher, Associate Professor of the Department of Fisheries and Wildlife at Oregon State University, will head a Sea Grant project to teach American Samoan natives how to build Pacific City Dories and how to use them to fish. The project will also give the Samoans training in installation, simple repair, and maintenance of inboard-outboard engines and outboard engines.

Dwight R. Stoffer, Fire Weather Meteorologist at the Cincinnati, Ohio, Weather Service Office, conducted a one-day training session for forestry students at the University of Kentucky at Lexington recently. The session provided a broad background for students generally unfamiliar with meteorology, and particularly stressed the NWS fire-weather forecast program in relation to the new National Fire Danger Rating System.

Jack Hummel, Meteorologist in Charge, and Bill Ezell of the Burlington, Vt., Weather Service Office, participated in a one-day meeting of the Vermont State Broadcasters and Civil Defense organization at White River Junction to discuss warning procedures, especially including the Emergency Broadcast System (EBS) within the State of Vermont. In addition to representatives from 13 radio stations and one TV station, the Commissioner of Public Safety for Vermont and a representative from the Office of Civil Defense Region I, Maynard, Mass. attended the meeting.

John Bernick of the Environmental Science Information Center's Scientific and Technical Publication Division (EDS), attended the Fifth Annual Conference of the Association of Earth Science Editors in Reno, Nev. last month.

Chalmers C. Wooden, Meteorologist in Charge of the NWS Office, Montgomery, Ala., and Acting Climatologist for Alabama, has taken the lead in arranging for the Alabama Department of Education and Civil Defense to set up a mandatory 9th grade course on the subject of "Natural Disasters." Mr. Wooden assisted in developing the curriculum with regard to storms and floods, and arranged for NOAA material to be furnished every 9th grade teacher in the state. The course is scheduled to begin in January.

Margaret Bennett, a secretary at the Data Buoy Center, won the title of "Miss MTF Torch of 1971" at the Mississippi Test Facility in competition with five girls representing other government agencies and industrial contractors located at the site.



A NASA Photo

As "Miss Torch" she will attend meetings and functions as the MTF representative during the Combined Agencies Campaign.

Dr. William T. Roubal, research biochemist at the North Pacific Fisheries Research Center in Seattle, Wash., was a speaker at the American Oil Chemists' Society meeting in Atlantic City, N.J., last month.

Joseph J. Brumbach, Jr., Climatologist for Connecticut and Rhode Island, has been appointed University Lecturer in the Plant Science Department of the University of Connecticut at Storrs. He is stationed on the university campus at Storrs. This non-paid appointment is unusual in that it is an appointment to the regular faculty, rather than as an adjunct lecturer. He has lectured to Crop Ecology and other classes during off-duty hours.

Ben Richmond, EDS-NODC liaison officer at Woods Hole, Mass., has located 100 potential sources of New England coastal marine data. He has personally contacted more than 40 agencies and individuals in academic institutions, industry, and State and local governments who hold data or are interested in the coastal zone. Future plans are to acquire these data to increase the coastal marine holdings of EDS' Data Centers.

James R. Neilon, Technical Assistant to the Chief of the NWS Communication Division, was in Geneva, Switzerland, recently to work with the WMO Secretariat officials on the development of the World Weather Watch Global Telecommunications System Manual.

Shipping Season Extension Plans For Great Lakes/Seaway Progress

Plans are being completed for the Great Lakes-St. Lawrence Seaway Navigation Season Extension Demonstration Program. The purpose of the program is to determine the economic and technical feasibility of keeping the Lakes open to shipping after adverse weather conditions would ordinarily have rendered them impassable.

The Ice Information Working Group, chaired by Max Mull, of the NWS Marine Weather Services Branch, met recently at Coast Guard District Headquarters in Cleveland, Ohio, to review arrangements for exchange of ice information between the observation points, the forecast offices, the Ice Navigation Center, and the users.

Other NOAA personnel who attended the meeting were Dr. Frank Quinn, Chief, and Donald Rondy, research physical scientist, Lake Hydrology Branch of the Lake Survey Center; and Meteorologist in Charge Richard Fay, principal assistant R. E. Hamilton, and ice forecast specialist H. D. Dyck, of the Cleveland Weather Service Forecast Office.

Also present were representatives of the Canadian Meteorological Service, the Coast Guard, the Detroit Office of the Army Corps of Engineers, and the St. Lawrence Seaway Development Corporation.

First Meeting of Marine Geophysics Coordinating Committee Scheduled

The NOAA Marine Geophysics Coordinating Committee will hold its first meeting Nov. 16-17 in Tiburon, Calif., at the Marine Minerals Technology Center. The committee, created at a NOAA Marine Geophysics meeting Oct. 5-6 to establish coordination and cooperation in marine geophysics, consists of the following members: P. Cohen, National Ocean Survey; L. Butler, Atlantic Oceanographic and Meteorological Laboratories; R. Burns, Pacific Oceanographic Laboratories; C. Townsend, NOAA Headquarters; B. Barnes, Marine Minerals Technology Center; and H. Meyers, Environmental Data Service.

Commander Harold A. Cotton Dies

Commander Harold A. Cotton, a member of the original commissioned corps of 1917, died October 30 in La Mesa, Calif. He retired in 1946 after 35 years with the Coast and Geodetic Survey, predecessor of the National Ocean Survey.

NMFS Study Advocating Trawling Results in Large Job Increase

Broadscale NMFS studies, undertaken with the financial cooperation of the Commerce Department's Economic Development Administration in 1964-67, indicated that underutilized species of fish native to Lake Superior could support a limited trawl fishery and a commercial-scale processing facility. NMFS research disclosed that the smelt fishing season could be extended by more than six months if trawls were used, instead of limiting the smelt fishery to the traditional use of pound-nets in the spring only. Investigation also showed that significant catches of chub (a popular smoked-fish item), abundant in Lake Superior, could be produced by trawling. On the basis of methods demonstrated in the NMFS feasibility study, Kemp Fisheries of Duluth, Minn., recently renovated and expanded its plant to accommodate the processing and marketing of frozen smelt products, and increased its employees from 10 to 130.

Investigation of Oil "Fingerprinting" Technique To Continue Under Sea Grant Program

A technique of "fingerprinting" oil which enables oil leaked from underwater wells to be distinguished from that from natural seepage has been devised by University of Southern California scientists. The new capability will help provide a reliable estimate of the actual amount of oil spilled in the massive 1969 platform blowout in the Santa Barbara Channel, and determine where most of it now reposes on the channel bottom, and how much of it has been broken down.

Investigative work on this project will continue under USC's Sea Grant Program.

NOS Satellite Triangulation Teams To Spend Winter Months Up North

National Ocean Survey satellite triangulation teams have completed observations of the PAGEOS satellite from stations in Bermuda, Puerto Rico, and Florida. Unit O2, under Larry D. Hothem, is presently en route to Frobisher Bay, Northwest Territory, Canada, and Unit O4, under Frank A. Wright of the NOS and Captain Michael Irwin of the United Kingdom Royal Engineers, is en route to Thule, Greenland. They will remain at these sites until March 1972.

Seminar Held at Cincinnati River Forecast Center



Shown above are the participants at the seminar held at the Cincinnati River Forecast Center in October. They are, in the first row (from left) - James Gilreath, Atlanta RFC; John Thomas, Silvio Simplicio, Eastern Region; John Croslin, Ft. Worth RFC; Bill Winston, Gerald French, Cincinnati RFC. Second row (from left)-Aldo Angelo, Cincinnati RFC; Robert Kilpatrick, Pittsburgh WSFO; Myron Gwinner, Harrisburg RFC; Charles Hopkins, Hartford RFC; Tom Bowers, Anchorage RFC; Michael Hudlow, Joe Strahl, Wallace Lamoreaux, Office of Hydrology. Third row (from left)- Joe Goldman, Eastern

Region Headquarters; Bill Ray, Cincinnati RFC; Ernest Marion, Eastern Region Headquarters; Ed Murphy, Ft. Worth RFC; Charles Schauss, Lower Mississippi RFC; Carl Relyea, Tom McPhillips, Cincinnati RFC; Dave Bauman, Portland RFC; Ralph Kresge, Office of Hydrology.

Participants not shown are: Elroy Balke, Central Region Headquarters; Herman Mondscheine, Kansas City RFC; David Coveney, NYC Regional Weather Center; Eugene Peck, Office of Hydrology; Mirco Snidero, NOAA Computer Division; and all other members of the Cincinnati RFC.

Sea Grant of \$600,000 Awarded University Units in New York

A Sea Grant of \$600,000 has been awarded to a group of 13 New York university units for ocean and Great Lakes research, education, and advisory services.

NOAA representatives David H. Wallace, Associate Administrator for Marine Resources, and Robert B. Abel, Director of the Office of Sea Grant, presented the Sea Grant to H. L. Diamond, representative of New York Governor Nelson A. Rockefeller, in the Governor's New York City office on October 27.

Along with matching funds from non-Federal sources, the grant will be used for a variety of marine-related projects over the next year by elements of the State University of New York (SUNY) and Cornell University. According to the Program Director for the New York Sea Grant Office, Dr. Donald F. Squires of the Marine Sciences Research Center, SUNY, Stony Brook, the geographic dispersion of the various units will allow development of a unique blend of research, training, and advisory services on the Great Lakes and on the Atlantic coastline of New York.

Research projects funded by the institu-

tional sea grant are concentrated in three major areas: marine environmental quality, coastal utilization and management, and resource development.

A portion of the funds will be used to improve and diversify the marine technology training programs at the Cedar Beach Mariculture Center of Suffolk County Community College, to identify manpower needs in marine-related industry and the training potential of New York schools, and to provide advisory services.

Units involved in the first year, with others expected to join later are: Cornell University; SUNY/Albany; SUNY/Binghamton; SUNY/Buffalo; SUNY/Stony Brook; the Marine Research Center, SUNY; the Western New York Nuclear Research Center, SUNY; the Atmospheric Sciences Research Center, SUNY; the State University Maritime College; the State University College of Agriculture at Cornell University; the Suffolk County Community College; and the State University College campuses at Brockport, Cortland, and Oswego.

National Oceanic and Atmospheric Administration

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