



noaa week

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72 Weather Mod. Projects Conducted in U.S. in 1975

Seventy-two weather modification projects, more than half of them intended to increase precipitation, were conducted in the United States last year, according to a report just published by NOAA.

With the goal of modifying weather over a 163,000 square mile target area in 25 states, the projects also were aimed specifically at dispersement of fog and the decrease of hail.

The NOAA report did not attempt to evaluate the success or failure of the weather modification activities.

The report, produced by NOAA's Environmental Modification Office, represents the most complete compilation available with commercial and government.

(Continued on page 6)

\$432,000 CZM Grant Awarded To Louisiana

Louisiana has been awarded a \$432,000 grant by NOAA to help cope with the pressures of offshore energy impacts. The grant will be matched by \$216,000 in State money.

A leader in offshore oil production, Louisiana was the site of the first oil lease sale in 1945, and the site of the world's pioneer offshore oil-producing well, completed in 1947, roughly 12 miles off Terrebonne Parish. According to latest statistics, the Bayou State produced over 650 million barrels of oil last year, and about 7 trillion cubic feet of natural gas.

Faced with the development of a large number of additional offshore oil and gas tracts, Louisiana applied to NOAA for funds to evaluate past, present, and future impacts of offshore oil and

(Continued on page 6)

SAVE THE DATE

NOAA's Annual Awards Luncheon will be held Friday, October 8, at 11:30 a.m. at the Bolling Air Force Base Officers' Club. Further details will appear in NOAA Week at an early date.

U. of Hawaii Receives Sea Grant

Continued research in tropical animal aquaculture is one of the major efforts to be carried out by the University of Hawaii under a \$1,355,000 Sea Grant marking the ninth year of Sea Grant support. The University will match the grant with \$738,569 in non-Federal funds.

The aquaculture program at the University—one of the most extensive in the Sea Grant program—involves five major areas of research:

—Improving the strain of *Macrobachium rosenbergii*, the Malaysian Prawn, through selective breeding that would result in greater profitability in commercial production;

—Studying the essential nutrient requirements in the diet of the Malaysian Prawn so more cost-effective diets can be determined for feed manufacturers;

—Expanding research into en-

(Continued on page 2)

NOAA's EEO Committee Elects Its 1976 Officers

Scrimshaw Hardship Being Remedied By Amendments

The economic hardship suffered by holders of sperm whale oil and scrimshaw legally obtained prior to the passage of the Endangered Species Act of 1973 is being remedied, according to the National Marine Fisheries Service.

The Act banned the import and sale of endangered species and their parts and products in interstate and foreign commerce, and did not permit commercial firms to use parts of endangered marine mammals, even though they had been obtained before the Act became law.

Recent Amendments allow individuals engaging in commercial

(Continued on page 3)

Recently elected as the 1976 officers of the NOAA EEO Committee, which serves as the advisory body on EEO matters to the Administrator of NOAA, were Landry Williams, Jr., Chairperson; Mary Breeskin, Vice-Chairperson; and Louis Rubin, Secretary.

Mr. Williams, a General Physical Scientist in the Marine Data Systems Project in the Office of the Director of the National Ocean Survey, is also the Vice-Chairperson of the NOS EEO Committee. He has been active in the Civil Rights Movement for many years.

Since joining the Coast and Geodetic Survey (predecessor of the NOS) in 1965 as a Civil Engineer, he has held positions also as a Cartographer and an Electronic Engineer.

He received his B.S. in electronics from Southern University; his master's degree from Frostburg (Md.) State College; and has done graduate work in computer systems management at American University.

Ms. Breeskin, who entered

(Continued on page 6)

Environmental Study Contracts Are Announced

The Environmental Research Laboratories have awarded several contracts lately which are part of a major marine environmental study conducted by ERL for the Interior Department's Bureau of Land Management as a portion of its Outer Continental Shelf Environmental Assessment Program. The Program seeks to determine the probable ecological impacts of oil exploration and development activities on Alaska's outer continental shelf.

Included were:

—A \$149,530 contract to Battelle Northwest of Richland, Wash., to study small marine organisms most likely to accumulate petroleum hydrocarbons and trace metals attached to sediment on the ocean floor.

The research will be carried out at Battelle's Marine Research Laboratory, located at the northeast corner of the Olympic Pe-

(Continued on page 4)



A COPY OF THE FIRST NEWSLETTER OF NOVAC (NOAA Voluntary Action, Inc.) was presented recently to Secretary of Commerce Elliot L. Richardson by Editor Esther Suher, a Secretary in the National Ocean Survey Office of Fleet Operations in Rockville, Md. NOVAC, an all-voluntary group—primarily NOAA employees—interested in helping other individuals and community organizations needing financial assistance, has just completed its Fourth Annual Membership Drive.

The Newsletter, which will be published quarterly, will contain information on NOVAC expenditures—loans, grants and donations to those who qualify under the organization's by-laws—and on future NOVAC-sponsored events to be held in the Metropolitan Washington Area.

A NOAA UNIT CITATION has been presented to the NOAA Ship Miller Freeman in recognition of the cooperative and dedicated attitude of the entire ship's missions in 1975.

The Award, presented by R. Adm. H. R. Lippold, Jr., (right) former Director of the Pacific Marine Center in Seattle, Wash., was accepted on behalf of the Ship's company by her Commanding Officer, Cdr. Sigmund R. Petersen.

Those honored were Cdr. Petersen; Lt. Cdrs. John T. Atwell and Warren K. Taguchi; Lt. Wayne L. Perryman; Lts. (jg) David C. Jarrett and Terrance D. Jackson; Ens. Michael J. Kretsch; Chief Boatswain/Fisherman Alfonso Langstrand; Lead Fishermen Andy Ness and Clarence M. Tondell; Skilled Fishermen Robert J. Mennucci, Glenn K. Kramer, Jeffrey D. Seefired, and William J. Borer, Jr.; Chief Engineer William E. Peck; Assistant Engineers Dominick Bujacick, Harold J. Finlayson, Craig B. Hodgert; Jr. Engineer Paul D. Rogers; Utilitymen Michael E. Martin and Anthony E. Unruh; Chief Quartermaster James P. Gardner; Chief Steward Benjamin C. Presley; Chief Cooks Donald

L. Potter and Robert Blanks; 2nd Cook Virgil K. Ruggles; Messman William B. Boswell; Senior Survey Technician Jan K. McCrory; Survey Technician Eric J. Jaeger; Chief Yeoman Warren L. Davis; and Joseph S. Miller, Jr., 1st Officer of the NOAA Ship Albatross IV, who was assigned to the ship for a training assignment on a temporary basis.



Part of ESIC Moving to Central Facility in Rockville

The Library and Information Services Division of the Environmental Science Information Center (ESIC), Environmental Data Service, is in the process of moving some of its holdings and staff from the Atmospheric Sciences Library, the Marine and Earth Sciences Library, and the Services Branch to a central facility in the former S&W Cafeteria building in Rockville. The renovated building will house division management, processing, and some of the services staff, as well as lesser user materials. Because of the move, access to materials

will be limited during September and October. Patience on the part of users will be appreciated in helping to continue operations as efficiently as possible during this period.

Softball League Seeks Players

Persons interested in playing softball in the spring of 1977 are asked to contact Floyd Smith by September 24, 1976, WSC-5, Room 210, 443-8336.

PARTICIPANTS IN THE RECENT ELECTRONICS PROGRAM OFFICERS' CONFERENCE at National Weather Service Central Region Headquarters in Kansas City, Mo., were (at table, from left) Dale Wilson, Omaha, Nebr.; Bill Bowden, Chicago, Ill.; Bob Mallory, Kansas City; Bill Fritts, NWS Headquarters; Keith Gregory, St. Louis, Mo.; Bob Thompson, Denver, Colo.; Don Henry, Minneapolis, Minn.; Marv Wycoff, Bismarck, N. Dak.; Jerry Reed, Indianapolis, Ind.; Jim Taylor, Lansing, Mich.; Steve Short, NWSH; H. D. Anderson, CRH; D. Max Entrikin, CRH; (seated by wall, from left) Carl Hall, NWSH; Leon Minton, CRH; Phil Calabrese, CRH; and (not in photo) I. D. Jones, Quality Control and Instrument Repair Branch of NWSH Engineering Division, Kansas City; and Chuck Webster, NWS Technical Training Center, Kansas City.



A DEPARTMENT OF COMMERCE BRONZE MEDAL has been presented to George F. Wall, Weather Service Specialist at the National Weather Service Office in Fort Wayne, Ind., "for his initiative and devotion to duty, especially during dangerous weather events." Particularly outstanding has been his significant contribution to the excellent warning services and adaptive weather forecasts for the citizens of northeast Indiana.

(From left) Evan McColly, Official in Charge at Fort Wayne; Charles G. Knudsen, NWS Central Region Director; Mr. Wall; and Mrs. Wall.

U. of Hawaii Is Awarded Sea Grant (Continued from page 1)

engineering and management procedures to optimize production of the Malaysian Prawn, concentrating on hatchery and production pond technology, and post-harvesting processing and handling;

-Studying the adaptability to growth in captivity of the threadfish, or moi, a desirable food and sportfish; and

-Developing a suitable baitfish—currently in short supply—for catching skipjack tuna.

Other projects will deal with the development of techniques for growing seaweeds as a source of industrial chemicals; the documentation of extent and quality of manganese resources in the Hawaiian Archipelago; the development of rapid, sensitive immunological procedures for identifying ciguatoxic fish, common to waters of tropical reefs, which can cause fatal disease in humans; and a study into the chemical structure of palytoxin, a highly unusual marine sub-

stance with potential application in biomedical research.

Researchers will pursue two socio-economic studies: one on the legal and institutional aspects of the exploitation of deep sea minerals and oil by multinational and state governmental instrumentalities in the Pacific; and the other on the impact of extension of the U.S. territorial waters to 200 miles on U.S. and Pacific-based multinational corporations engaged in the exploitation of ocean resources.

Also, the University's School of Medicine will continue its program in diving physiology by concentrating on studies of the development of gas bubbles in tissues of submerged animals, including humans, and on heat losses in submerged divers; and its Engineering Department will study the effect of waves on shallow reefs in relation to protection of low-lying coastal areas and investigate the feasibility of a new concept in the design and construction of undersea observatories.

noaa week

Published weekly at Rockville, Md., by the Office of Public Affairs for the information of employees of the Commerce Department's National Oceanic and Atmospheric Administration.

Articles to be considered for publication should be submitted at least a week in advance to NOAA Week, Room 221, WSC-5, Office of Public Affairs, National Oceanic and Atmospheric Administration, Rockville, Md. 20852.

NOAA Week reserves the right to make corrections, changes or deletions in submitted copy in conformity with the policies of the paper or the Administration.

Catherine S. Cawley, Editor
Warren W. Buck, Jr., Art Director

A NOAA UNIT CITATION has been presented to National Marine Fisheries Service personnel at the Northeast Fisheries Center in Woods Hole, Mass., whose contributions made the recent Assessment Subcommittee Meeting of the International Commission for the Northwest Atlantic Fisheries a success. The members of the ICAAF Support Group honored were (front row, from left) James Sandlin, Violet Torra, Helen Christie, Mary Cleaveland, Peggy Orr, Elizabeth Bevacqua, Betty Crook, Gwendolyn Kelley, Albert Ranson, (back row, from left) Paul Wood, Anne Tibbetts, Pamela Lanham, Gordon Waring, Margaret Mehmel, Eva Montiero, John Brennan, Otis Jackson, and (not in photo) Arthur Berrigan,



Sea Grant Funds Fish Kill Study At U. of Miami

Sea Grant scientists at the University of Miami will continue their studies into the causes of recurrent fish kills in Cayne Bay and the associated canal system under a \$306,800 Sea Grant announced recently. An additional \$183,300 in matching funds will be provided by the university to support these activities.

The scientists are seeking reasons for the major fish and shellfish disease outbreaks, and attempting to develop new or improved techniques for the diagnosis, prevention, treatment and control of the diseases.

Using data provided by the Florida Department of Natural Resources and the National Marine Fisheries Service, the Sea Grant scientists are aided in their research by specialists at the university's School of Medicine and the Rosenstiel School of Marine and Atmospheric Science.

The investigations are coordinated with city, county and state pollution control, natural resources and public health agencies. Findings are transmitted to these agencies for action in the event the diseases are caused by possible improper industrial waste practices, agricultural applications, sewage treatment, or excessive algae growth preventing oxidation from permeating the water.

Also to be carried out or continued in this year's program are supporting projects dealing with bacteria and virus; a review of selected legal problems concerning marine resource and shoreline utilization; efforts in providing specialized training in

More 6th Anniversary Open Houses Listed

NOAA field facilities which have indicated intentions of holding Open House to celebrate NOAA's 6th Anniversary, and have not been mentioned in *NOAA Week* earlier, are:
 -The National Weather Service facilities at the U.S. Naval Air Station, Intra-Alaska; Juneau; Palmer (at the Palmer Seismological Observatory); Anchorage; and Fairbanks, Alaska, will all hold Open Houses on October 1.
 -WSO Jacksonville, Fla., on

October 4 or October 8.
 -WSFO Charleston, W. Va., on October 2 and 3.
 -WSO Roswell, N. Mex., on October 2 or 3.
 -WSO Tulsa, Okla., on October 2 and 3.
 -WSO Lincoln, Nebr., on October 6.
 -WSFO Sioux Falls, S. Dak., on October 2.
 -WSO Elko, Nev., on October 2 and 3.
 -WSFO Portland, Oreg., on October 3.
 -WSFO Memphis, Tenn., on October 10.
 -WSO Meridian, Miss., on October 17.
 -WSMO Stephenville, Tex., on October 3.
 -National Marine Fisheries Service Laboratories in Pascagoula, Miss., on October 29 and 30.

About 500 people attended the Open House held by the National Weather Service Office in Rockford, Ill., in conjunction with the airport's Open House.

Amendments Remedy Scrimshaw Hardships

(Continued from page 1)

activities and holding inventories of sperm whale oil and scrimshaw on December 28, 1973, before passage of the 1973 Act, to apply to the Director of NMFS for a certificate of exemption. This would permit the commercial sale of the materials for a limited time. Applications for the permits will be accepted by the NMFS through August 17, 1977, and those issued will be good for a three-year period from date of issuance.

NMFS has published interim regulations which, among other things, outline the procedures for applying for the permits.

Comments on the interim regulations will be accepted through September 20, 1976, and should be addressed to the Director, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, Washington, D.C. 20235.

ocean and coastal laws; and an assessment and analysis of many aspects of recreational fishing and boating in the Dade County and South Florida areas.

EDS Assists AMS In Automation Of MGA Journal

The American Meteorology Society (AMS) with substantial support from the Environmental Data Service's Environmental Science Information Center (ESIC) has automated several steps in both the publication of the Meteorological and Geostrophical Abstracts (MGA) journal and in the generation of computer-readable tapes from which the on-line searchable data base is built.

The MGA, published monthly by the AMS, contains references to published articles in the fields of meteorology, surface water hydrology, climatology, glaciology, physical oceanography, solar physics, and related subjects. Each monthly journal contains approximately 600 abstracts. ESIC has sponsored the automation of the data base on the Lockheed DIALOG international network for automated information retrieval. The on-line data base is available through the Oceanic and Atmospheric Scientific Information System (OASIS). Terminals in access to the system are operational at approximately 30 NOAA locations throughout the United States.

The newly implemented automation of MGA streamlines operations for the AMS by elimination of duplicate key-boarding for the abstract journal and computer-readable tapes. Manual generation of the published author, subject, and geographic indexes is no longer necessary. The automated procedure provides concurrent publication of the abstract journal and generation of the magnetic tapes for the on-line data base. Most importantly, the on-line data base will contain the very latest MGA abstracts published.

Contact your nearest NOAA library or information center for use of MGA or approximately 35 additional automated bibliographic data bases.

A DEPARTMENT OF COMMERCE BRONZE MEDAL has been presented to Fern Gwynn, Supply Technician in the Administrative Management Division at National Weather Service Western Region Headquarters in Salt Lake City, Utah, for "Outstanding service over a long period of time."

Mrs. Gwynn, who is responsible for contracts and leases, has been in the Procurement and Supply Branch at WRH for 24 years.

The Award was presented to Mrs. Gwynn by Hazen H. Bedke, NWS Western Region Director.





A DEPARTMENT OF COMMERCE BRONZE MEDAL has been presented to Beatrice M. Chappell of the National Weather Service Systems Development Office in Silver Spring, Md., in recognition of her superior performance and outstanding achievement in the field of fiscal control. Mrs. Chappell was cited for "handling critical and sensitive reimbursable accounts in a most timely and accurate manner."—and for "continued outstanding performance accentuated by a high sense of responsibility, devotion to duty and dependability."

The Medal was presented by NWS Director Dr. George P. Cressman. In the background is NWS Associate Director, Meteorology and Oceanography, Karl R. Johannessen.

Contracts for Marine Environmental Study Are Awarded

ninsula at the mouth of Sequim Bay, Wash. At present the laboratory operates flow-through exposure systems capable of simulating low-level, chronic oil pollution. The systems can expose organisms to varied mixtures of seawater and crude or fuel oil for periods of up to six months, with total petroleum hydrocarbon levels of less than one part per million.

According to scientists at Battelle Northwest, fine sediments found in back bays and turbid regions of the coastal zone represent the type of materials most likely to adhere and retain petroleum hydrocarbons. Marine sediments with no detectable hydrocarbon contamination from a lagoon in nearby Sequim Bay will be used in this project.

First, small marine organisms known as polychaetes, will be combined with a water extract of Prudhoe Bay, Alaska, crude oil, and a mixture of radioactively-labeled hydrocarbons and fine mud particles for a one-to-two-month period. After the animals are removed from the sediment, some organisms will be allowed to purify themselves in clean mud for two days, others for one and two weeks, to flush their digestive tracts of the contaminated or radioactive sediment. Scientists will then analyze the organisms' tissues for absorbed trace metals and sediments.

Later, slightly larger marine organisms known as sipunculids will be combined with a more porous sediment and an undiluted sample of Prudhoe crude oil containing a mixture of radio-labeled hydrocarbons. During this phase several sampling inter-

vals will be used to determine the levels of hydrocarbon or trace metal accumulation by the organisms.

Finally, a crustacean and a bivalve species of ocean floor organisms, common to the Pacific Northwest and Alaska's outer Continental shelf region, will be introduced to an oil-hydrocarbon-sediment environment and their tissues analyzed for the presence of as many specific hydrocarbons as possible. The rates and extent of hydrocarbon and trace metal accumulation by these larger organisms will be compared with the two smaller classes tested in the earlier phases of the research.

—Contracts totaling \$109,073 to LGL Limited of Bryan, Tex., and Edmonton, Canada, to assess the ecological impact of petroleum development on barrier island ecosystems in the Beaufort Sea, and marine birds in the Bering Sea.

Scientists with LGL Limited will focus part of their research on the six most abundant marine bird species on rocky and remote St. Lawrence Island, in the Bering Sea southwest of Nome, Alaska.

After sampling areas have been established within the breeding regions, the ornithologists will map, photograph, and survey the island weekly through mid-September. During this time they can observe when birds arrive at their nesting areas, and at what time the onset and peak of egg-laying, hatching, and departure of adults from the nesting areas occur. Species included in the survey are common and thick-billed murre, crested and least auklets, horned puffins, and

1976 Great Lakes Coast Pilot Published

Publication of the 1976 edition of the Great Lakes Pilot, used primarily by the maritime industry and recreation boaters to assist in safe navigation, has been announced by the National Ocean Survey.

Long known as the "Bible" of the Great Lakes mariner, the Great Lakes Pilot contains more than 600 pages of facts on physical features and changing conditions necessary for safe navigation on the Great Lakes, the St. Lawrence River above St. Regis, the New York State Barge Canal System, Lake Champlain and other connecting waterways.

A supplement to the navigation information shown on standard nautical charts, the Great Lakes Pilot is popular with researchers, students and great Lakes 'buffs' who want more information about their favorite lakes.

The 1976 edition has up-to-date descriptive sections for each of the Great Lakes; Great Lakes distance tables; the compass and the Earth's magnetism in the Lakes' region; and a table of

azimuths of ranges. Other data presented include signals for opening locks and bridges; names of bridges and other structures; outstanding landmarks; descriptions of shorelines and harbors; U.S. laws; and dimensions and capacity of dry docks and marine railways.

The 1976 edition may be purchased for \$8 from the NOS Distribution Division (C44), 6501 Lafayette Avenue, Riverdale, Md. 20840, or from NOS sales agents throughout the nation.

Fish Hatchery Construction Grant Awarded

A grant of \$225,950 to complete construction of the Hump-tulips Salmon Hatchery near Grays Harbor, Wash., has been awarded to the Washington Department of Fisheries by the National Marine Fisheries Service. The award, funded under the Anadromous Fish Conservation Act, is based on a State-Federal cost sharing basis of 72/28 percent. Previous Federal grants totaling \$670,950 have been made during the past two years by NOAA and the State of Washington's share of the cost has been \$2,309,800, making a total of \$3,206,700 for the project.

The hatchery, started in 1973, is scheduled to be completed and in operation this fall. The project includes incubation facilities, rearing pens, a water distribution system, an intake pump station, fish ladder, and settling ponds. Projections of returns of fish raised and released by the hatchery should add approximately \$700,000 annually to the salmon fishery in the State. The hatchery will be operated by the Washington Department of Fisheries.

tracts could be an inevitable result of such exposure.

To carry out the research, the Johns Hopkins team will monitor walrus activities using remote sensing equipment aboard the National Aeronautics and Space Administration's Convair 990 and smaller U.S. Coast Guard research aircraft. The NASA flights are part of the Bering Sea Marine Mammals Experiment (BESMEX) conducted by the U.S. Fish and Wildlife Service. Data will be gathered using color and ultraviolet photography, microwave radiometers, laser profilometers, and infrared mapping devices aboard the research aircraft.

The scientists will investigate herring gull colonies throughout the Gulf of Alaska because the gulls are an excellent indicator species for a decline in environmental quality caused by the presence of man. Due to their food habits and wide distribution, herring gulls may provide early indication of petrochemicals in the marine environment.

(Continued from page 1)

black-legged kittiwakes.

In a separate study, LGL Limited will assist in planning a major study of ecological processes of the Arctic barrier island lagoon ecosystem, to be carried out near Jones Island in the Beaufort Sea. This portion of the research will be undertaken in October 1976 and from March to September 1977.

The contracts include \$69,098 for the St. Lawrence Island bird survey, and \$39,975 for the barrier island lagoon ecosystems study.

—A \$36,750 contract to Johns Hopkins University's Department of Pathobiology in Baltimore, Md., to study the ecological, behavioral, and meteorological conditions influencing walrus activities in arctic waters, and to assess herring gull colonies in the Gulf of Alaska.

The university researchers will concentrate on walrus behavior—how much walrus are affected by ice conditions in the Bering, Chukchi, and Beaufort Seas and what other environmental conditions influence the time when walrus "haul out" of the water onto the ice.

Walrus are especially vulnerable to impacts of oil and gas development. One critical aspect of the ice-dominated environment that may magnify the potential impact of oil on walrus and other mammals is the limited amount of open water present in or about the edge of the pack ice. The small open areas in the ice that are vital to these mammals for movement, breathing, and feeding could hold oil in varying degrees of concentration for long periods of time. Thus, contamination of the animals' respiratory passages and digestive

A NOAA UNIT CITATION was presented recently to the NOAA Ship Discoverer for sustained superior performance during Calendar Year 1975. According to R. Adm. Allen L. Powell, "The overall operation of the ship was especially commendable despite its recent reactivation and subsequent transfer to the Pacific Marine Center. The ship's complement has been praised for superb cooperation, competence, and dedication to the overall tasks they have performed."

The citation was presented by R. Adm. H. R. Lippold, Jr., former Director of PMC, and accepted on behalf of the ship's company by Capt. Clinton D. Upham, Commanding Officer of the Ship.



SPECIAL ACHIEVEMENT AWARDS also were presented recently by Capt. Upham (right) to three officers assigned to the Discoverer. Lt. Cdr. Jimmy A. Lyons, Operations Officer (left); Lt. (jg) Douglas G. Hennick, Navigation Officer (center); and Lt. (jg) M. Christine Wencker, who has transferred to the NOAA Ship Davidson, were honored for their performance during reactivation and initial ocean research operations of the ship in Alaskan waters.

Women's Equality Day, Hispanic Week Recognized at NMFS La Jolla Laboratory

Seventeen employees at the National Marine Fisheries Service Southwest Fisheries Center's La Jolla Laboratory took part in a special workshop on September 1, in San Diego, in recognition of Women's Equality Day and Hispanic Week. The event, sponsored by the Federal Equal Employment Opportunity Council of San Diego and Imperial Counties, was designed to assist Federal activities to meet requirements in their local and national affirmative action plans which mandate special programs in observance of these two events.

Heading the contingent from the Center were Anita Coit, Se-

lective Placement and Placement for Vietnam-Era Veterans Coordinator; Elaine Sandknop, Federal Women's Program Coordinator; and Henry Orr, the Laboratory's Spanish-Speaking Programs Coordinator. Registration fees paid by persons attending will be reimbursed by the Center under the Individual Training Program.

According to Izadore Barrett, Acting Center Director, this was the largest group of participants sponsored for attendance by the Center at an EEO event, and was an indication of the Center's commitment to "make the EEO program work".



PARTICIPANTS IN THE RECENT INDUSTRIAL METEOROLOGY MEETING at the National Weather Service Central Region Headquarters in Kansas City, Mo., included (seated at table) R. L. Carnahan, Special Assistant for Industrial Meteorology, NOAA Headquarters, Rockville, Md.; Arlo Gambell, Lombard, Ill.; Harvey Freese, Des Moines, Iowa; Bruce Watson, Roseville, Minn.; Seth Kemble, Kansas City; Henry Newhouse, Operations Research Analyst, Systems Development Office, NWS Headquarters, Silver Spring, Md.; Carl Reber, NWS Southern Region Headquarters; Mike Smith, Wichita, Kans.; John Henz, Ft. Collins, Colo.; Walter Bohan, Park Ridge, Ill.; Boynton Beckwith, Palatine, Ill.; (not in photo) Loren Crow, Denver, Colo.; Dave Duisik, Kansas City; John Aquino and Dale Jessen, Northfield, Ill.; Edward W. Ferguson, National Environmental Satellite Service Satellite Field Services Station, Kansas City; and John Smith and Bob Krebs, CRH.

LSU Receives \$720,000 Sea Grant

Louisiana State University has received a \$720,000 Sea Grant, which marks the ninth consecutive year of support for marine activities in research, education, and advisory services by NOAA. It will be administered through the University's Center for Wetland Resources.

With the help of more than \$570,000 in matching funds pledged by the University, the grant will support 28 projects at LSU, Nicholls State University, the University of Southwestern Louisiana, and the University of New Orleans.

One project, scheduled for completion this year, involves the use of an antibiotic, gentamicin, to eliminate salmonella from green turtle eggs. The marketing of pet turtles, once a \$2.5 million industry in Louisi-

ana, has been curtailed by the salmonella threat, but information from the LSU research is being used to aid the industry in its effort to hatch and market a safe and healthy pet.

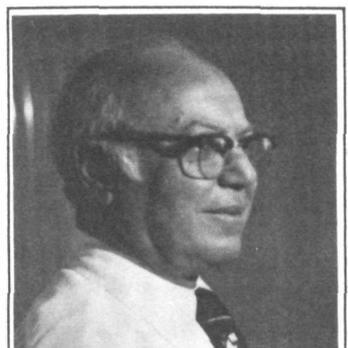
At the University of Southwestern Louisiana, researchers are working on ways to put crawfish wastes to work as fertilizer. For every pound of edible crawfish, almost six pounds of waste result. Last year the more than 17 million pounds of crawfish waste produced within a 20-mile radius of Breaux Bridge, La. (a center of crawfish processing), could nourish some 10,000 acres of farmland. Preliminary studies show that increased yields of up to five tons per acre can be realized for vegetable crops, and that ornamental plants raised on the waste composted with rice hulls were equal in quality to those grown in a high cost, standard growing medium.

At LSU's Center for Wetland Resources, work will continue on studies of fresh water-salt water exchange in Louisiana's estuaries; an inventory and mapping of recreational camps in the State's coastal marshes; and chemical and biological studies of the impact of chronic contamination by hydrocarbons in the area's coastal zone.

Researchers at Louisiana State University's Law Center and the Department of Rural Sociology are involved in the legal, social, and economic aspects of coastal areas. A much needed examination of the relationship between port commissions and pipeline companies on the one hand, and the State and Federal agencies that regulate their work, is being undertaken.

EDS Prepackaging Computerized Literature Searches

The Library and Information Services Division, Environmental Science Information Center (ESIC), Environmental Data Service, has begun a series of prepackaged computerized literature searches, drawing on two data bases: *Meteorological and Geostrophysical Abstracts* and *Oceanic Abstracts*. The first in the series has been printed and contains approximately 280 citations on the subject of "International Policies, Agreements, Law, Regulations, and Cooperation Relating to the Oceans." It is available without charge from the Systems Branch, Library and Information Services Division, ESIC, EDS, 3300 Whitehaven Street, N.W., Washington, D.C. 20235. A second search, dealing with "Manganese Nodules in the Oceans," is underway, and will be available within the next few weeks.



A **DEPARTMENT OF COMMERCE BRONZE MEDAL** has been presented to George Blandino, Lead Forecaster at the National Weather Service Forecast Office in Milwaukee, Wis., for "his unselfish dedication to the public in carrying out the National Weather Service mission in an extremely competent manner." Particularly outstanding have been his participation and leadership in providing weather services to the public and his planning and coordination with the aviation, marine and agricultural weather users.

A DEPARTMENT OF COMMERCE BRONZE MEDAL was presented recently to Raymond J. Sauer (left), Administrative Officer in the Administrative Operations Division at the Northwest Administrative Service Office (NASO) in Seattle, Wash., for "exemplary service manifested by significant contributions and achievements in areas of contracting/procurement and administrative services." The Medal was presented by Dale C. Gough, Director of NASO.



Weather Modification Report *(Continued from page 1)*

ment weather modification projects conducted in the United States during the year. By law, those individuals and commercial firms engaged in weather modification activities must report on their projects to NOAA. Additionally, through informal agreement, any government agencies attempting to modify the weather also advise NOAA.

The summary of 1975 programs showed 72 activities, 11 of which were conducted in California, nine in Oklahoma, seven in South Dakota, and six each in Colorado and Michigan.

In area coverage, South Dakota—with a target area of 50,085 square miles—was the largest, followed by Utah, North Dakota, Kansas, California, and Florida.

Other states in which weather modification projects were conducted were: Alaska, Delaware, Idaho, Illinois, Indiana, Iowa, Maryland, Montana, Nebraska, Nevada, New Hampshire, Oregon, Pennsylvania, Texas, Washington, and Wyoming.

The NOAA summary indicated that while the number of weather modification activities in 1975 was slightly fewer than for the preceding year, the total target area sought to be affected was about 10,000 square miles greater.

Seeding of clouds with silver iodide was the most frequent method used in the modification efforts, with dry ice, propane and polyelectrolytes also used. Ground-based and airborne equipment were used almost equally in the seeding techniques.

Community associations, such as groups of farmers, sponsored 22 activities; Federal agencies sponsored 14, most of them of a research nature; and airlines and airports sponsored 10 activities, all dealing with fog dispersal. Other sponsors included municipal districts, states, cities, counties, and power companies.

In addition to providing detailed information on the various modification programs, the report lists all current regulations

concerning weather modification, including recent amendments to the law. It also contains copies of revised reporting forms.

A second section of the report, concerned with selected domestic and foreign weather modification activities, includes information on national organizations and meetings; reports on coordination, review and commentary; evaluation of selected state operational programs; a review of proposed legislation; discussion of legal actions; and, a report on international activities, including foreign programs.

The report is available, without charge from NOAA, EM-5, 6010 Executive Blvd., Rockville, Md., 20852.

Officers for 1976 Are Elected by NOAA EEO Committee *(Continued from page 1)*



Mr. Rubin



Mr. Williams



Ms. Breeskin

NOAA as an Administrative Trainee, is a Program Analyst on the Resources Management Staff in the Office of the Director of the National Weather Service. She is Vice-Chairperson of the NWS EEO Committee, and also liaison representative from the NOAA EEO Committee to the Federal Women's Program Committee. A member of the NWS EEO Committee since 1974 and of the NOAA EEO Committee since 1975, she has been involved in the structuring within NOAA of the Federal Women's Program. She received her B.A. in mathematics education from the University of Maryland; taught mathematics in junior high school for a year; and worked as a technical publications editor in the Computers Di-

Air-Sea Research Grant Awarded

A \$51,228 grant for research on how seasonal and daily coastal storms determine the water circulation and dispersal of pollutants within the greater New York harbor area has been given to the University of Miami's Rosenstiel School of Marine and Atmospheric Science by the Environmental Research Laboratories.

The award was made to the university's Professor Christopher N. K. Mooers.

Until now scientists have not determined to what extent water circulation and pollution dispersal in the New York research area are driven by meteorological forces. But they do know that the water circulation is affected by winds, atmospheric pressure, and heat and moisture exchange with the atmosphere.

Louisiana CZM Grant *(Continued from page 1)*

gas development on State coastal areas. The State will evaluate, for instance, the environmental impacts of offshore operations on fishing and trapping, deepsea mineral mining, navigation, transportation, and other commercial and industrial activities.

In their grant application, officials noted that the energy impact assessment would augment and support the State's coastal zone management program, designed to achieve a balanced use and development of Louisiana's coastal environment. Information gathered from the impact study will be incorporated into the development of the coastal zone

By analyzing past meteorological records from the Environmental Data Service's National Climatic Center and current information from NOAA's environmental data buoys and meteorological stations within the coastal region, Prof. Mooers will construct a descriptive model of storm conditions which affect the New York Bight—a 15,000-square mile oceanic region between Montauk Point, N.Y., and Cape May, N.J. This is the site of an environmental study being conducted by ERL's Marine Ecosystem Analysis (MESA) program.

Dr. Donald V. Hansen, Director of the Physical Oceanography Laboratory of ERL's Atlantic Oceanographic and Meteorological Laboratories in Miami, will monitor the project.

management program, midway toward completion.

The management program is coordinated by the Office of Coastal Zone Management, which provides technical and financial assistance to states through the Coastal Zone Management Act.

To develop its program, Louisiana has received over \$1.3 million through three NOAA grants and added another \$660,000 in State matching funds.

The latest funds from NOAA will enable Louisiana to build upon existing data collected from previous studies regarding Outer Continental Shelf (OCS) impacts.

alist in the Scientific and Technical Pool of the NWS Meteorological Satellite Section, which later became part of NESS.

He received his B.S. in meteorology from the City College of New York and his M.S. in the technology of management (comprehensive fields of computer systems and management information systems) from American University.

The NOAA EEO Committee includes a representative from the NOAA Corps, and the Chairpersons and Vice-Chairpersons from the EEO Committees in NOAA's Major Line Components in the D.C. area, and from NOAA Headquarters and the Office of Administration.

NOAA employees may attend the regularly scheduled monthly meetings, which are held the second Wednesday of each month at 1:30 p.m. at various locations in NOAA buildings, but must make reservations with the Committee Recording Secretary, Faye Abbott, two weeks prior to any meeting they wish to attend.

The Committee also meets quarterly with the Administrator, Associate Administrator, and MLC Directors, or their representatives; and quarterly meetings also are held with the Personnel Division.

NOAA Participates In Demonstration Of SCORPIO System

John H. Clotworthy, Director of the Office of Congressional Liaison; Robert Abel, Director, and Ernest Greenwald, Program Analyst, Office of Sea Grant; Donald Hunt, Office for Environmental Monitoring and Predictions; and Robert Freeman, Deputy Director, Environmental Science Information Center, Environmental Data Service, were recent participants in a demonstration of the Library of Congress' new on-line computerized information retrieval system, SCORPIO. Particular attention was given to a data base that allows rapid tracking of the status of bills before Congress. The data base is prepared and updated daily by the Congressional Research Service. The Environmental Data Service is investigating the conditions under which NOAA terminals might gain access to SCORPIO, which will permit speedy tracking of the status of bills of interest to NOAA.

Pacific Tide Party Installs

The Pacific Tide Party recently installed two specially modified Bristol bubbler tide gages at Prudhoe Bay, Alaska. The gage was modified to a five-foot range so that the small tides along Alaska's Arctic Coast could be measured accurately.

Mickey K. Moss, Assistant Chief, and Lt. Garth Stroble installed the gages at ARCO Docks 1 and 2 at the request of the National Ocean Survey Tides Branch. A permafrost zone beneath the water necessitated the use of a portable steam generator to steam a pipe into the permafrost; the pipe was used to support the tide staff and tide gage orifice.

The photo shows a portable Cobra drill being used to drive bench marks attached to long rods into the permafrost.

A five-man field party under the direction of Bill Lewis, from the NGS, ran 20 miles of geodetic levels between the two tide gage locations.

Coastal Sediments Research Grant Is Awarded to Yale University by ERL

A \$25,794 grant for continuing research on determining accumulation rates and mobilization of coastal sediments in the New York Bight has been given to Yale University in New Haven, Conn., by the Environmental Research Laboratories.

The award was made to Dr. Karl K. Turekian of Yale's Department of Geology and Geophysics.

After deposition, sediments are remobilized by actions of currents, burrowing organisms, and storms. The accumulation rates and stability of coastal sediments are of interest to Yale and

Jupiter's Circulation Modeled by ERL Scientists

The frigid hydrogen atmosphere of Jupiter, seemingly so alien, may actually behave something like earth's atmosphere—and something like the oceans, too.

An Environmental Research Laboratories scientist applied a computer model of the earth's atmosphere to Jupiter and found it not only reproduced the patterns known to exist, but provided new explanations of such visible features as the Great Red Spot and the horizontal stripes, and revealed a four-year cycle in the transfer of heat.

"Essentially what I'm trying to do is predict the weather on Jupiter," explains Dr. Gareth P. Williams, who heads a team at ERL's Geophysical Fluid Dynamics Laboratory in Princeton, N.J., that studies the atmospheres of other planets. Using a set of equations describing the physical processes that produce atmospheric behavior on earth, he fed in those conditions known about Jupiter—its enormous size, the amount of sunlight it receives, its rate of rotation.

"Weather" on Jupiter differs from earth's, but the basic behavior of the two atmospheres turns out to be quite similar. "So Jupiter represents an alternative climate to earth's. The same principals apply, but the conditions are different," says Dr. Williams.

"There also are similarities between circulation on Jupiter and what we find in the oceans on earth," he adds. The reason is the rotation of the mammoth planet dominates the behavior of its atmosphere.

"The influence of rotation is probably something like 100 times what it is in the earth's atmosphere. Things tend to get smeared out in the horizontal much more strongly. This is how it is in the ocean on earth."

The result is an atmosphere that moves mainly in the horizontal. Turbulence, which on earth can go any which way, on Jupiter is two dimensional.

It can't dissipate energy, so it transfers it to larger scales. Eddies in the Jovian atmosphere combine to form ever larger ed-

dies. Dr. Williams explains, "you get a cascade of energy. The eddies get bigger and bigger until they reach a critical point, when they begin to feel the influence of the curvature of the planet." At this point, when the eddies have grown to the size of the visible bands, giant waves, moving east-west, develop.

The waves, called Rossby waves, slow down the cascade of energy. They transfer energy from the eddies into a mean flow of the atmosphere around the planet. This mean flow, a series of jet streams, corresponds to the varicolored bands—light-colored "zones" alternating with darker "belts"—we see in telescopic images of the planet.

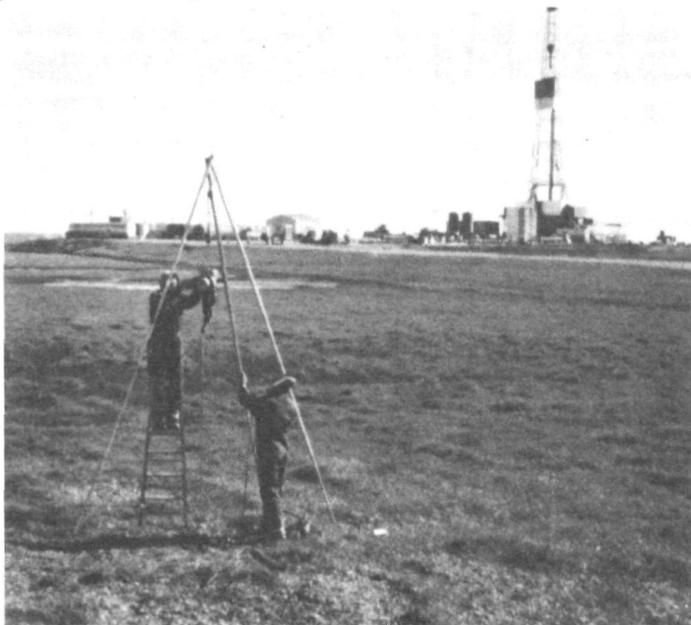
The jet streams on Jupiter are like those on earth, except more numerous. While earth has only one jet stream in each hemisphere, Jupiter has four or five running parallel to the equator. The Jovian jet streams form along the boundaries between adjacent bands, so that the edges of each band are traveling in opposite directions.

The Great Red Spot, a 30,000-mile-(48,000-kilometer)-long feature in the southern hemisphere of Jupiter, appears in Dr. Williams' model as a special type of eddy in the flow of the atmosphere. "Eddies form between the jet streams. If two adjacent streams differ in speed by the right amount, then a permanent eddy could form between them."

"The basic purpose of atmospheres is to transfer heat from the equator to the poles," says Dr. Williams. The sun pours more heat into equatorial regions than polar regions. When the difference between the two extremes builds up to a critical level, cyclones (closed circulation systems with low atmospheric pressure) and anticyclones (high-pressure regions) develop to reduce the temperature gradient, and then die out when the distribution of heat is stable once more.

The terrestrial heat cycle takes about a month. The NOAA model revealed a corresponding cycle on Jupiter that takes four years. The atmosphere of Jupiter, Dr. Williams found, also develops cyclones and anticyclones, but they are smaller and transport less heat. In addition, atmospheric motions on Jupiter tend to perpetuate themselves rather than die out, as they do on earth. Interaction with the earth's surface has a stabilizing influence that eventually damps out atmospheric upsets. Jupiter has no "surface" as we know it. "It just gets denser towards the interior, and motions gradually dissipate downward, getting slower and slower. Only the upper half mile or so of earth's oceans is active; the depths are relatively stagnant. Jupiter may be like that."

Special Tide Gages at Prudhoe Bay in Alaska



NOAA scientists because of the release of materials from the sediments to the overlying waters, and because of work in near-shore waters, including mine dredging operations, offshore construction, and some types of commercial fishing operations.

Dr. Turekian and his colleagues plan to calculate sediment accumulation rates and reworking by storms and biological activity by using naturally occurring radioisotopes of lead, radium, and thorium as the measurement tools. The naturally occurring radioisotope of lead present in coastal sediments is derived

from marine organisms falling to the bottom, by chemical scavenging of the water column, and from soil eroded from the land. If the sources are constant in their supply rate per mass of sediment, the decay of the excess radioisotope of lead in the core sample can be used to determine the age of the sample.

The Yale research will be applied by NOAA's Marine Ecosystems Analysis (MESA) New York Bight Project but will also be applicable to university research being carried out in Long Island Sound.

notes about people

Capt. James P. Randall has been appointed Commanding Officer of the NOAA Ship Rainier. He has been serving as Associate Director of the National Ocean Survey's Office of Aeronautical Charting and Cartography since 1974, and earlier this year was awarded a Department of Commerce Bronze Medal "for superior leadership and major contributions in meeting the demands of the aviation community for accurate aeronautical charts."



Capt. Randall

A member of the commissioned corps since 1954, Capt. Randall has served aboard seven ships, and been Commanding Officer or Executive Officer of five of them. He has also served as Chief of a photogrammetric field party; command pilot of an air photo mission; liaison officer with the Federal Aviation Administration; Deputy Director of the NOS Executive and Technical Services; and Technical Assistant to the NOS Associate Director for Aeronautical Charting and Cartography.

He received his degree from the University of Cincinnati, and has attended executive and service schools, including the Army's Flight Training School and the Armed Forces Staff College.

John V. Graff has been named Meteorologist in Charge of the National Weather Service Forecast Office in Minneapolis, Minn.; where he has served as Principal Assistant since 1969. He succeeds the late Joseph H. Strub, Jr.



Mr. Graff

Mr. Graff entered the NWS in 1959 at Detroit, Mich., and in 1961 transferred to Washington, D.C., where he served as a Forecaster at the Air Route Traffic Control Center. In 1963 he became Technical Assistant in the Office of Meteorological Operations.

He graduated from St. Louis University with majors in meteorology and business administration.

Elizabeth Y. Gamble, a clerk in the Hydrologic Research Laboratory of the National Weather Service Office of Hydrology, has been accepted for graduate study and awarded a scholarship for a two-year Master's Degree Program in Minority Mental Health,

at Washington University in St. Louis, Mo. Miss Gamble graduated in May from the University of Maryland with a B.A. degree in psychology. Working part time during the school year and full time each summer, she has been employed by the Laboratory since July 1973.

Carol Wright, Secretary to the Director of the Environmental Research Laboratories in Boulder, Colo., since 1974, recently was awarded a Certified Professional Secretary rating by the National Secretaries Association.



Ms. Wright

The rating is earned by passing a two-day, six-part examination administered annually by the Institute for Certifying Secretaries, a department of the national organization. While more than 25,000 secretaries have taken the rigorous test during the past 25 years, fewer than one-third of the candidates have passed the examination.

Ms. Wright joined the National Bureau of Standards in Boulder, in 1965, and was Secretary to the Chief of the NBS Time and Frequency Division for five years before transferring to ERL.

Deep Ocean Mining Literature Search To Be Conducted

Documentation Associates of Los Angeles, Calif., has been awarded a \$50,000 contract by the Environmental Research Laboratories' Pacific Marine Environmental Laboratory in Seattle, Wash., to conduct a comprehensive literature search for the Deep Ocean Mining Environmental Study (DOMES).

DOMES, managed by ERL, is a large-scale effort to assess the environmental effects of mining manganese nodules on the ocean floor. The project focuses on an area of the Central Pacific where mining is expected to begin soon.

The information services firm will collect and distill all scientific literature relating to the environmental questions posed by DOMES, and will seek information on the DOMES study area and other, similar oceanic regions.

In addition to sifting through the usual sources—library indexes and bibliographies, specialized libraries, and computerized lists of data and publications—the firm's information specialists will contact individual scientists to obtain pertinent unpublished information. A final report will summarize findings that answer specific questions posed by DOMES project managers in the Marine Ecosystem Analysis program office.

calendar of events

September 13-15
Washington, D.C. OCEANS 76—Annual Conference-Exhibition of Marine Technology Society and Council on Oceanic Engineering of the Institute of

Electrical and Electronics Engineers. (Mrs. Mary Ann Paturis, Marine Technology Society, 1730 M Street, N.W., Washington, D.C. 20360. 202-659-3251.)

September 25
Washington, D.C. 5th Annual INWARD TO THE SEA, "The International Ocean II." Seminars from (9:30 a.m. to 5:00 p.m., and Underwater

Film Festival begins at 7:30 p.m.) For program and ticket information, write: Inward to the Sea, P.O. Box 41010, Washington, D.C. 20014.

Sept. 30 - Oct. 1
Victoria, British Columbia. Twenty-Third Pacific Northwest Regional Meeting of American Geophysical Union. (John T. Weaver, Dept. of Physics, University of Victoria, Victoria, B.C., Canada V8W 2Y2.)

October 5-8
St. Jovite Quebec, Canada Second Magnetospheric Cleft Symposium; An AGU Chapman Conference, cosponsored by the National Research Council of Canada and Canadian Association of Physicists (R. W. Dolan, National Research Council of Canada, Ottawa, Ontario, Canada K1A 0R6.)

October 21-23
Ann Arbor, Mich. Joint meeting of the Midwestern Region of American Geophysical Union and the Eastern Section of the Seismological Society of America. (Cynthia Beadling, AGU, 1909 K St., N.W., Washington, D.C. 20006. 202-331-0370.)

November 8-10
Los Angeles, Calif. "The Decade Ahead," the Ninth Annual Conference of the Sea Grant Association, co-hosted by the Sea Grant Programs at the University of Southern California and the University of Hawaii. (Dorothy Bjur, USC Sea Grant Programs, SSW 308, University Park, Los Angeles, Calif. 90007. 213-746-6068.)

Nov. 28-Dec. 1
San Francisco, Calif. Fourth International Congress of the World Wildlife Fund. (See item in NOAA Week dated April 2, 1976.) (Dawn Herrmann, World Wildlife Fund, Fourth International Congress, 1319 Eighteenth St., N.W., Washington, D.C. 20036. 202-466-2160.)

December 6-10
San Francisco, Calif. American Geophysical Union 1976 Fall Annual Meeting. Deadline for receipt of abstracts was September 10, but post-deadline

abstracts will be considered. (Cynthia Beadling, AGU, 1909 K St., N.W., Washington, D.C. 20006. 202-331-0370.)

September 10-25, 1977 Downunder 77, the Fifth World Underwater Congress of the Confederation Mondiale des

Australians, organized by the Australian Underwater Federation, and to be held in conjunction with the Second International Conference on Artificial Reefs, the First World Symposium on Underwater Sports Medicine, International Conference on Maritime Archaeology, and International Conference/Workshop on Underwater Photography. Three days of technical sessions in Brisbane, Queensland, will be followed by 12-day Congress/Cruise of the Great Barrier Reef and the Coral Sea (by about one-fourth of participants in the opening sessions). Advance deposits (\$200) are payable now a first-come, first-served basis in conformance with restricted contingents allocated to various regions of the world. (Downunder 77, P.O. Box 67, St. Lucia, Queensland. 4067. Australia.)

Oct. 11-13, 1977
New Orleans, La. Chapman Conference on Oceanic Fronts. Sponsored by the American Meteorological Society, the Office of Naval Research, and

the American Geophysical Union. Deadline for preliminary abstracts is November 1, 1976, and for revised abstracts, April 1, 1977. (Cynthia Beadling, AGU, 1909 K St., N.W., Washington, D.C. 20006. 202-331-0370.)



National Oceanic and Atmospheric Administration

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