

Pacific May Yield Clue To Weather

A major experiment, heavily dependent upon NOAA aircraft and NOAA Data Buoys, is probing the equatorial Pacific Ocean and atmosphere for clues as to how this region influences North American weather and global climate, according to Dr. Bradford Bean, NOAA Weather Modification Program Office.

Called the NORPAX (for North Pacific Experiment) Equatorial Shuttle Experiment, the study has drawn researchers and equipment from NOAA, the Office of Naval Research, the University of Hawaii, and the Scripps Institution of Oceanography, to the Pacific south of Hawaii.

The Shuttle Experiment, like the broader NORPAX itself, is managed by the Scripps Institution with support from the Office of Naval Research and the National Science Foundation's International Decade of Ocean Exploration program.

The Shuttle Experiment focuses on the interactions of atmosphere and ocean that produce the seeds of weather systems which eventually become storms and sweep over North America. Similarly, thermal and other oscillations deep in the equatorial ocean may be one key to important shifts in global climate. These interactions occur over various intervals of time and space, and have never before been measured in any systematic way.

Since late November, scientists have been taking the first systematic, simultaneous observations of the processes that control the exchange of energy and matter between the

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Wind Shear Detector Under Study



NMFS's Southeast Fisheries Center's Charleston (S.C.) laboratory will be completed this month, and ready for occupancy by March.

A sensor installed in the cockpits of airplanes to measure heat of air columns in the flight path ahead may someday warn pilots of dangerous wind shear near airport runways.

Two scientists with ERL's Atmospheric Physics and Chemistry Laboratories, Drs. Fernando Caracena and Peter M. Kuhn, are studying the potential of an infrared radiometer as a wind shear detector. The device measures the infrared radiation, or heat, emitted by an air column.

Caracena and others believe that thunderstorm downdrafts, and the gust front that precedes the wedge of cold air as it moves across the land, are causes of hazardous wind shear, a sudden shift in the speed or direction of winds. At least three airliner crashes in recent years were caused by thunderstorm-associated wind shear.

Since the outflow from a storm is colder than the surrounding air, Caracena reasoned that horizontal temperature gradients could provide a way of detecting low-level wind shear. Other scientists, he said, have demonstrated a relationship between changes in temperature across a gust front and the intensity of low-level wind shear.

Instrument technology to provide a warning already exists, according to Kuhn. He has been working with infrared detection of atmospheric temperature, and believes a relatively inexpensive infrared radiometer in the cockpit of an airplane would give the pilot a direct warning of wind shear along his flight path.

Kuhn pointed out that a plane landing would pass through a steady, but gradual, "normal" increase in temperature, because the temperature

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NOS Will Publish New Airport/Facility Guide

A new, seven-volume "Airport/Facility Directory" will be published during the next five months by the National Ocean Survey.

The first volume, covering the southeastern part of the U.S., is now available. The publication schedule for the remaining six volumes is: South Central, late January; Southwest and Northwest, mid-March; and, North Central, East Central, and Northeast, mid-May. All volumes will be updated and reissued in their entirety every eight weeks.

The new directory replaces "Part 2—Airport Directory," and "Part 3—Operational Data and Special Notices" of the Federal Aviation Administration's "Airman's Information Manual (AIM)."

The directory is designed for use with aeronautical charts covering the conterminous U.S., Puerto Rico and the Virgin Islands. Information provided includes the associated city and state names with an alphabeti-

cal cross reference when the city and airport name differ (airports are listed alphabetically by city), runway characteristics, lighting, communications, radio aids to navigation, and the sectional and enroute charts on which they are shown.

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Shellfish Supplies Increase

Supplies of some major shellfish products—shrimp, scallops, lobster tails, and west coast crab—increased in the first half of 1977 over average supplies of the previous two years, according to NMFS. Greater supplies brought some softening in prices, viewed as a normal market reaction and not as an indication of any underlying weakness in demand.

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New Glacier Data Ready From WDC-A

A new publication series, *Glaciological Data*, is available from World Data Center A for Glaciology. It supersedes *Glaciological Notes*, an accession bulletin.

Each issue of the new series—which will appear 3 to 4 times per year—comprises a systematic bibliography on a selected theme, based on available printed bibliographies, holdings in the WDC-A, and available computer-retrieval systems. A cycle covering the major topics in glaciology (avalanches, arctic sea ice, ground ice, glaciers, ice sheets, snow cover, antarctic sea ice, freshwater ice, etc.) will span approximately two years.

Subsequent issues will provide an updating and expansion of these lists. Issues on other themes or issues providing regional coverage of snow and ice studies may be published from time to time. In addition to the bibliography, short contributions relating to the collection, organization, and retrieval of data on the subject covered are included.

The first issue (on avalanches) was published in July 1977. It contains discussions of avalanche terminology and of procedures and problems in avalanche data collection; descriptions of avalanche research in Switzerland, Colorado, the USSR, and Iceland; and book reviews. The bibliography of non-Russian literature consists of over 600 citations and covers the period 1950-1977. A supplement containing the Russian citations will be published at a later date.

Glaciological Data is available free from: Marilyn J. Shartran, Editor, *Glaciological Data*, World Data Center-A, Glaciology, Institute of Arctic and Alpine Research, University of Colorado, Boulder, Colo. 80309. Telephone: (303) 492-5171, FTS 323-4311.



Igor Segaev (right), a hydrologist for the Soviet Union's Atlantic Institute for Marine Fisheries and Oceanology (AtlantNIRO) in Kaliningrad, hands a Nansen (water-sampling) bottle to Andy Draxler, a chemist for NMFS's Sandy Hook Laboratory, on board the Soviet's research vessel *Argus*. The *Argus* is the largest vessel yet to participate in the 11 years of joint fisheries research between the NMFS's Northeast Fisheries Center (of which the Sandy Hook Laboratory is a part) and AtlantNIRO. The water sample was taken during the October 15 - November 11 cruise (one of several scheduled during the *Argus's* six-month stay), which studied the physical and chemical oceanography, primary productivity, and zooplankton of the continental shelf from Nova Scotia to Cape Hatteras.

Airports (From p. 1)

In seven 5- by 10-inch bound volumes, the directory is available by subscription from NOS. Subscribers may order one or any combination of the seven volumes. Present subscribers to Parts 2 and 3 of the "Airman's Information Manual (AIM)" and NOS aeronautical charts will be notified in advance and provided with order forms to subscribe to the new directory.

Annual individual subscription rates are: Full U.S. coverage (7 books), \$37.50; one-book subscription (any region), \$10.00; two-book subscription (any combination), \$17.50; and, each additional book over initial two-book (any combination), \$5.00 each.

Subscriptions may be obtained by writing the National Ocean Survey, Distribution Division (C-44), Riverdale, Maryland 20840; telephone (301) 436-6993. Mail orders sent to National Ocean Survey offices must be accompanied by check or money order made payable to "NOS, Department of Commerce, C-44."

Shellfish (From p. 1)

Sharp price increases experienced in 1975 and 1976 likely have affected the demand for shellfish, fisheries officials believe, making prices more sensitive to changes in supplies. Thus, even though strong market demand for shellfish products is anticipated through the first half of 1978, supplies of some major shellfish are expected to be sufficiently high to influence prices. The prices of shrimp, lobster tails, and

Pacific Weather (From p. 1)

equatorial Pacific Ocean and the atmosphere.

Their study—ending in late January—employs aircraft from Navy Reserve squadrons and NOAA, moored and free-drifting buoys from Scripps and NOAA, bottom sensors emplaced by the University of Hawaii, and the university's research vessel *Kana-Keoki*. This battery of oceanographic and boundary-layer sensors will observe the ocean and atmosphere along the meridian of 150 degrees west longitude,

Shear (From p. 1)

of the atmosphere normally decreases about half a degree Celsius with each 328 feet (100 meters) of altitude. In a gust front/wind shear situation, there would be a more sudden and drastic change. This was proven in an actual test when a radiometer aboard a descending plane detected a 3.6-degree-Fahrenheit (two-degree-Celsius) temperature discontinuity over a mile away.

Computer tests conducted by Kuhn demonstrated that the instrument could easily detect temperature changes of nine degrees Fahrenheit (five degrees Celsius) in a narrow band at distances of up to six miles (9.5 kilometers) and distinguish these sudden changes from the "normal" temperature change. This would give a pilot enough time to prepare for a shift in winds.

king crab could drop, while higher prices are likely for scallops and American lobster, supplies of which are not likely to increase, officials believe.

Copies of "Shellfish—Market Review and Outlook—November 1977" are available by writing to the Industry and Consumer Services Division, National Marine Fisheries Service, NOAA, Washington, D.C. 20235.

from 20 degrees north to 20 degrees south across the equator.

The NORPAX Equatorial Shuttle Experiment is viewed by participating scientists as a prelude to a similar but larger one to begin late in 1978 as part of the Global Weather Experiment. That project is one of a series of international studies conducted under the auspices of the World Meteorological Organization's Global Atmospheric Research Program.

Warm Water Eddy

Hurricane Power Studied

As tropical storm Anita rapidly intensified into a hurricane last August, it may have drawn part of its power from a pool of warm water in the Gulf of Mexico, and cooled Gulf surface waters several degrees.

Those preliminary conclusions came from measurements made by scientists at ERL's Atlantic Oceanographic and Meteorological Laboratories in Miami, Fla., and aboard NOAA research aircraft and a Texas A&M University research ship, Gyre. The measurements could be the most complete set of direct observations of a hurricane drawing its energy from the warm sea.

The unique opportunity to observe these crucial hurricane-sustaining processes developed as tropical storm Anita began to form in the Gulf of Mexico in late August, moving over a warm eddy in the Gulf.

The eddy—a slowly rotating, 150-mile (225-kilometer) wide pool of water about a degree warmer than surrounding Gulf water—had been discovered a month earlier by Drs. Harris B. Stewart and John Proni of AOML. Its continued existence was confirmed on August 28 by an oceanographer aboard the ship Gyre, as the storm developed.

NOAA NEWS

Published biweekly 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 10 days in advance to NOAA News, Room 221, WSC5, Office of Public Affairs, National Oceanic and Atmospheric Administration, Rockville, Md., 20852.

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

Nancy Pridgeon, Editor
Warren W. Buck, Jr., Art Director

The next day a NOAA research aircraft probed Anita, and during that flight meteorologist Peter Black took water-column temperature profiles with airborne, expendable bathythermographs. These devices are dropped into the ocean and radio back measurements of water temperatures at various depths.

The measurements later were supplemented by water-column observations made by the Gyre, when the ship returned to the same area of the Gulf about 10 days after Anita's passage.

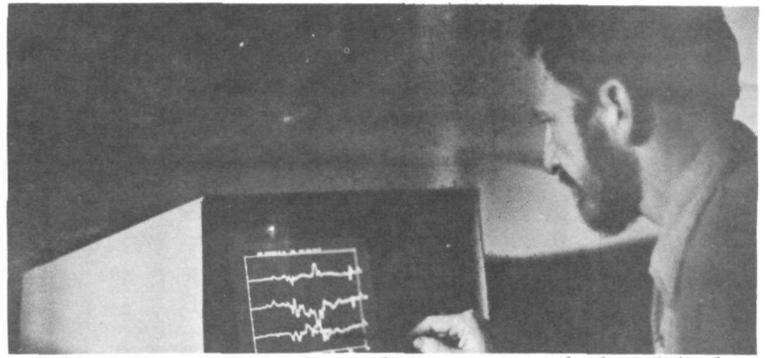
"Preliminary analysis of our data," Proni reports, "shows the disturbance intensified steadily to tropical storm strength as it moved toward the center of the warm eddy. Then, about 18 hours later, a deepening trend in central pressure began as the storm passed the western boundary of the eddy. Anita reached hurricane force a short time later."

The observations may hold important implications for understanding the ocean's role in hurricane formation. "This warm eddy appears to have started with a breakoff of the Gulf of Mexico Loop Current," Proni said. "We wonder whether the presence of a broken-off warm eddy in the central Gulf makes passing storms more likely to intensify into hurricanes. We hope to get at least a partial answer to this from studies of the Anita data."

NOS Map and Chart Catalog 5 Available

A new catalog of special purpose charts and bathymetric maps has been published by National Ocean Survey, indexing bathymetric maps, topographic/bathymetric maps, and marine boundary maps and charts.

Also indexed for the first time are Tidal Current Charts, Marine Weather Service Charts, Storm Evacuation Maps, and orthophoto maps of Florida's coastal zone. Included are insets indexing Offshore Mineral Leasing Area Maps, Geophysical



Cdr. Ron Newell, NOAA Corps, demonstrates stack-plotted display.

Magnetometer "Hot Line" Now Set Up In Boulder

Several times each day, a substorm is apt to break loose far out in the earth's magnetic field, producing auroral displays and blocking radio signals.

To keep close track of these disturbances, the most extensive collection of up-to-the-minute magnetic field data ever assembled is now flowing into ERL's Space Environment Laboratory in Boulder, Colo. The data come from 25 magnetometer stations in four special network chains across the Americas and the Pacific.

The reporting system is a part of the International Magnetospheric Studies project, a worldwide survey of the earth's plasma environment lasting through 1979. The reports will help scientists decide when to initiate elaborate IMS research experiments, involving balloons, rockets, and satellites. SEL's space forecasters also will use the data to alert their regular scientific and commercial customers to substorm onsets.

Rapid reporting of the far-

flung observations is made possible by two recent technological advances: acquisition of ground-based magnetic data in digital rather than graphical form, and transmission of the digital data to SEL/Boulder by NOAA's geostationary satellites. In the past, direct transmissions of magnetic data to SEL came only from magnetometers on the satellites themselves.

The way the information is displayed will be almost as helpful to forecasters as its quick availability. SEL's computerized Data Acquisition and Display System, SELDADS, will automatically present data for each chain of stations together, in easy-to-use stack-plotted form.

The waiting period for processed data now will be shortened by several months. Every month, SEL will generate microfilm and computer tapes of edited data and forward them to World Data Center A in Boulder.

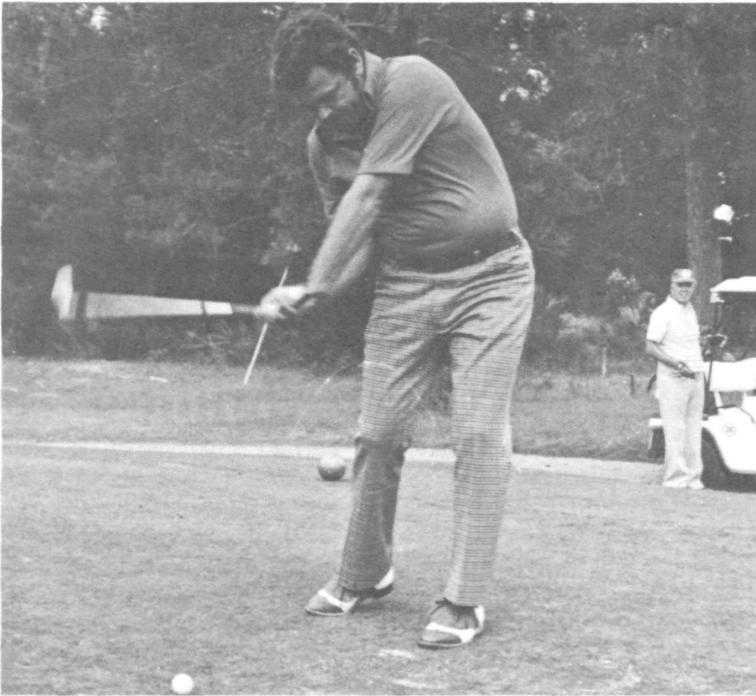
Maps, and the International Hydrographic Bureau (IHB)-supported General Bathymetric (plotting) Charts of the Oceans (GEBCO).

The catalog, "Map and Chart Catalog 5—Bathymetric Maps and Special Purpose Maps," is available free to the public. It may be obtained from NOAA's National Ocean Survey, which will make copies available at the following boat shows: Chicago (Jan. 4-8), Houston (Jan. 6-14), New York (Jan. 12-22), Cleveland (Jan. 20-29),

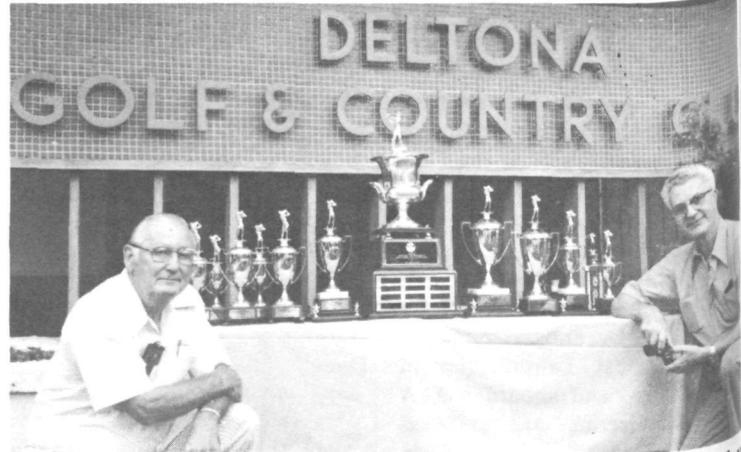
Detroit (Feb. 3-12), Baltimore (Feb. 4-12), New Orleans (Feb. 11-19), Washington, D.C. (Feb. 18-26), Miami (Feb. 23-Mar. 1), and Richmond (Mar. 1-5).

The catalog also may be obtained from the National Ocean Survey, Distribution Division (C44), Riverdale, Md. 20840 (Phone: (301) 436-6990); Counter Sales, National Ocean Survey, 6001 Executive Boulevard, Room 101, Rockville, Md. ((301) 443-8005); or from local marine supply agents.

How's This For Fun in the Sun . . .



Buck Christian, West Palm Beach, Fla., driving off first tee.



Lloyd Brotzman (left) and A. Carlin, both retirees, didn't play golf but came to see old friends.



Lloyd Brotzman talks the action over with three golfers at the close of the first day of competition.



Families and friends await the arrival of contestants at the 19th hole.



Sam Calvert, Committee Chairman (left), and Marshall Hatch (center) present trophy to Bob "Pro" Pritchard, winner of the 1977 match.

The seventh annual NOAA Invitational Golf Tournament was played the last week in October at the Deltona Golf and Country Club, in Deltona, Fla.

The tournament is sponsored each year by the National Weather Service's Southern Region, headquartered in Fort Worth, Tex., but is open to all NOAA golfers, both active and retired, who would like to enter.

Each year, the tournament has grown in popularity—it began in 1971. More than 60 golfers vied for trophies this year, and more than 100 persons attended. There also was a women's division, mostly wives of NOAA participants.

In fact, there were enough golfers in the women's division this year to hold a mixed team event on one day. The event may become a regular part of the program in the future.

The three-day outing began

with practice and fun contests and just general renewing old acquaintances. Among the scheduled were putting and driving contests, longest drive and closest to the pin contests.

Serious golfing began the morning of the second day, with tee-off times and tournament rules posted, and continued through the third day of the meet—a Saturday.

According to Marshall Hatch, now retired from ERL and a member of the tournament's committee: "After a bitter head-to-head struggle, Bob Pritchard of the Weather Service Office in Montgomery, Ala., edged Harold Van Dyke of Upper Marlboro, Md., on the final hole to win the 1977 championship."

Third was Bill Burnett from Silver Spring, Md. Last year's winner, Marshall Hatch, from Miami, Fla., was fourth.

Other winners were:

... NOAA Golfers Meet in Florida



Larry Mahar, retired director of the Weather Service Southern Region, addressed the awards banquet.

Handicap—1st place, Marshall Hatch, Miami, Fla.; 2nd place, Mike Burnett, Columbus, Ga.; 3rd place, Sam Calvert, Miami, Fla.

Driving Contest—Carroll McCutcheon, Fort Worth, Tex.
Putting Contest—Bill Brown, Miami, Fla.

Longest Drive—Henry Tonkin, Miami, Fla.

Closest to Pin—Bill Brown, Miami, Fla.

In the Women's Division, Murl Franklin of Montgomery, Ala., was the first place winner.

In the Women's Division Handicap, first place was won by Bonnie True, Miami, Fla.; second by Dottie Burnett, Silver Spring, Md.; and third by Libby Kerchusky, Columbia, S.C.

The 1977 Grand Trophy was presented at the Awards Banquet held Saturday night. The trophy is permanently at home in Southern Region Headquarters. Inscribed on it are the

names of past scratch and handicap winners, who will be joined by this year's. Other winners' and fun trophies were awarded at the banquet.

Following dinner, a dance was held as old friends celebrated three days of fun in the sun and promised to get together again next year.

The 1978 tournament, according to the committee, is already on the planning boards. News and progress reports are promised. If you did not attend the 1977 tournament, and are interested, get on the distribution list for the 1978 information by sending your name and address to:

Sam Calvert, Golf Tournament Chairman, NOAA/RFC, P.O. Box 520197, Miami, Fla. 33148.

(Photos on these two pages taken by Ralph F. Kresge, NWS retiree, except the photo at the dance, by Marshall Hatch.)



There was even a trophy for the person who traveled the greatest distance to participate. Brian Hahn (left) came all the way from Des Moines, Iowa. Sam Calvert presents the trophy.



Murl Franklin (left) receives the first place award in the Women's Division, presented by Marie Jackson, the official match score keeper.



And after the awards banquet, the dance.

Class Complaint Guidelines Furnished by EEO Office

A group of employees, former employees, and/or applicants for employment, on whose behalf it is alleged that they have been, are being, or may be adversely affected by a NOAA personnel management policy or practice which NOAA has the authority to rescind or modify, and which discriminates against the group on the basis of their common race, color, religion, sex, national origin, or age may file a class complaint of discrimination.

The agent for the class must consult with an EEO Counselor within 90 calendar days of the matter giving rise to the complaint or if the alleged discriminatory act is in connection with a personnel action, within 90 calendar days of its effective date. The EEO Counselor will counsel on, and attempt to resolve, the matter within 30 calendar days. If the counselor is unable to resolve it, the aggrieved person is advised in writing of the right to file a formal, written class complaint, and of the names and addresses

of officials with whom such complaints may be filed.

At all stages of the class complaint process, the agent has a right to representation, providing the choice of a representative does not involve a conflict of interest or conflict of position.

If a formal complaint is filed, it is forwarded to the Director of EEO, for transmittal to an appropriate Field Office or the Federal Employee Appeals Authority (FEAA), Civil Service Commission, for the assignment of a Complaints Examiner. The Examiner reviews the complaint file and issues to the Director of EEO, a recommended decision to accept or reject the complaint. The Examiner provides the class agent and the agency's representative with a copy of the recommended decision.

The agent, the representative and the agency's representative, are primarily responsible for developing the evidence to prove or disprove the allega-

tions raised and the issues accepted for processing. However, if the Examiner determines that it is necessary or appropriate, the Examiner may, without consultation with the agency, the agent, and/or the representative, request CSC's Bureau of Personnel Investigations to provide an investigator trained and/or certified by CSC, to conduct an investigation of the complaint on a reimbursable basis. The Examiner provides copies of the investigative report to the representative of each party.

While a hearing is mandated in each case, it is not necessary that oral testimony be presented at the hearing. The hearing may be opened solely for the receipt of written evidence and presentations.

Class members file claims only if the final agency decision includes a finding of discrimination. In filing a claim, it must be demonstrated that: (1) the claimant is a member of the class; (2) the claim is timely; and (3) the alleged injury which

the claimant suffered as a result of the discriminatory policy or practice occurred sometime between 135 calendar days prior to the filing of the class complaint and the date the agency issued its final decision on the complaint. If a claim is not resolved within the agency, it must be referred to a Complaints Examiner. The burden is on the agency to show that the claimant was not injured as a result of the discriminatory policy or practice.

The agency's final decision on a class complaint must address the merits of the complaint; must include a finding on the issue of discrimination; must speak to the merits of the class agent's personal allegation; and must include the corrective action, if any, awarded to the class agent.

(The above information was furnished by the NOAA Equal Employment Opportunity Office.)

NOAA Personnel Division Lists Current Vacancies

Announcement No.	Position Title	Grade	MLC	Location	Issue Date	Closing Date
191-78	Electronics Technician (5 vacancies)	GS-10	NWS	Erie, Pa. Greensboro, N.C. Richmond, Va. Columbus, Ohio Harrisburg, Pa.	1/5/78	1/19/78
192-78	Construction Representative (Sector Facilities Technician)	GS-11	NWS	Chicago, Ill.	1/5/78	1/19/78
193-78	Meteorologist (Forecaster) (2 positions)	GS-12	NWS	Phoenix, Ariz.	1/6/78	1/20/78
194-78	Meteorologist (Flash Flood and Severe Weather Preparedness Meteorologist)	GS-13	NWS	Fort Worth, Tex.	1/6/78	1/20/78
195-78	Meteorologist (Environmental)	GS-12	NWS	Stoneville, Miss.	1/6/78	1/20/78
196-78	Supervisory Meteorologist (Meteorologist-in-Charge)	GS-12	NWS	Fargo, N. Dak.	1/6/78	1/20/78
199-78	Administrative Officer	GS-11	HDQS	Rockville, Md.	1/9/78	1/23/78
186-78	Electronics Engineer	GS-12	ERL	Miami, Fla.	1/4/78	1/25/78
188-78	Personnel Officer	GS-13	NWS	Garden City, N.Y.	1/4/78	1/25/78
189-78	Chemist	GS-11	ERL	Seattle, Wash.	1/5/78	1/26/78
197-78	Librarian (Physical Sciences)	GS-12	EDS	Silver Spring, Md.	1/6/78	1/27/78
198-78	Conservation Coordinator	GS-13/14	NMFS	Washington, D.C.	1/6/78	1/27/78
146-78	Supervisor Hydrologist	GS-15	NWS	Silver Spring, Md.	12/13/77	3/15/78

Evelyn Liddel of EDS's Environmental Science Information Center has been detailed to the White House Conference on Balanced National Growth and Economic Development for an approximate four-month period. The Conference, scheduled to begin January 29, 1978, and to end February 2, 1978, will involve 500 participants from all walks of American life in an attempt to discover new ways to bring into balance the present disparities in income, business activity, and quality of life encountered by various segments of our nation.

Ms. Liddel was requested for this duty because of the somewhat unusual combination of her experience garnered from six plus years of working for ESIC. Her knowledge of the ATS and WYLBUR text editing computer programs, in addition to the intricacies and special features of the Lexitron Text Processor and of standard printing requirements, provides an overview necessary to the effective paperwork demands of the Conference.

Joseph Pileggi, staff assistant to the NMFS Assistant Director, completed 40 years of fisheries employment with the Federal Government, on Nov. 30.

This year, Pileggi received the National Market News Association's Distinguished Service Award at its 20th annual meeting, June 22-25, in San Francisco, Calif.

Forty years ago, Pileggi was hired to start the Fishery Market News Service in the Department of Interior's Bureau of Commercial Fisheries, the forerunner of NMFS.

Highlights of his career include assignments as U.S. delegate to the Third Caribbean Fisheries Conference; Chief, Fishery Market News Service; Chief, Branch of Foreign Fisheries; Acting Assistant Director for International Affairs; Chief, Fishery Administrator; Chief, Statistics and Market News Division; and Editor of *Commercial Fisheries Review*, now the *Marine Fisheries Review*.

Born in Philadelphia, Pa., he attended Strayer's Business College and the College of Christian Education. He then studied at New York University, at Boston University, and finished at George Washington University, Washington, D.C., in 1953.

Some years ago, Joseph G. Galway, NWS's Severe Local Storms lead forecaster in Kansas City was consulted by a newspaper reporter on a project documenting the Waco tornado of 1953. Recently, a nonfiction book entitled *The Tornado* was published by Doubleday and well received in book reviews. The book recounts some incredible survival experiences of about a half dozen families on that fateful day. Galway's help was not forgotten—he recently received a letter from the former newspaper reporter and now author, J.E. Weems, expressing his "deepest appreciation" for Galway's technical advice.

NOAA Corps Officer James S. Midgley, of Hopedale, Mass., has been promoted to Captain. Midgley, 39, is one of the youngest NOAA Corps officers to be promoted to the rank of Captain.

Following graduation from the University of Massachusetts in June 1959 with a degree in civil engineering, he was appointed to the NOAA Corps, and first assigned to geodetic field parties before serving aboard four NOAA ships.

Early in 1965, Midgley went to Fredericksburg (Va.) Magnetic Observatory and subsequently to the Tsunami Warning Center in Honolulu, Hawaii. He later became Chief of the Processing Division at the Pacific Marine Center in Seattle, Wash., and then Chief of the Operations Division in the Office of Fleet Operations, Rockville, Md. Presently, he is assigned to the Associate Director, Office of Fleet Operations, as Staff Assistant, Labor Relations and Program Development, in the National Ocean Survey.

Puget Sound

Reference Series Scheduled

The Sea Grant Program at the University of Washington has initiated a three-year publication effort to produce a definitive reference series on the marine aspects of Puget Sound.

The project is being managed by the University of Washington for ERL's Marine Ecosystems Analysis (MESA) Puget Sound program office.

The series will interpret scientists' understanding of marine topics for laymen so

that the wealth of existing information on the marine environment will be available to regional coastal-zone managers and planners.

The series will consist of 15 to 20 volumes, each devoted to a separate topic dealing with the marine environment, written by a recognized expert in that field.

The first volume is scheduled for publication early in 1979; the final volume in mid-1980.

Jeffrey Sampaga works half time as a Biological Aid (Microbiology) at the Honolulu Laboratory, NMFS's Southwest Fisheries Center. Sampaga's job is to "read" otoliths of fishes.

Otoliths, in fishes and other animals, are small bones found in the inner ear, which help the animals in hearing, and are used by fishery scientists to determine the age of fishes. On each otolith is found numerous microscopic lines, the number depending on the age of the fish, similar to growth rings found in trees. Fishery scientists know that these growth lines are laid down daily in the otolith of fishes. Sampaga counts these lines, under a compound microscope, to determine the age of a fish.

Sampaga also is a paraplegic. He lost the use of his legs in an accident and now spends most of the day in a wheelchair. But he does not let a handicap like

not being able to walk deter him. He comes to work unaided in a car that allows him to drive using only his hands, entering and exiting his car unaided, including folding and unfolding his wheelchair.

Sampaga's other activities include athletics. He plays wheelchair basketball and recently took part in the Hawaii Coaster Invitational Basketball Tournament. The team, the Hawaii Coaster Whites, of which Sampaga is captain, had a 6-0 mark for the season and took the championship in the tourney. Sampaga scored 19 points in the final game of the tourney and was voted the most valuable player of the tournament.

A week before the basketball tourney, Sampaga entered the Honolulu Marathon and wheelchaired his way around the 26-mile course in a little over four hours.



Jeffrey Sampaga

FROM THE GALLEY



ANTIPASTO SALAD

- | | |
|---|------------------------|
| 1 can (6 ½ or 7 ounces) albacore or other solid pack tuna | Carrot Sticks or curls |
| 1 can (7 ¾ ounces) red salmon | Ripe olives |
| Crisp salad greens | Green onions |
| 1 cup potato salad | Hard-cooked egg slices |
| Cucumber slices | 1 tablespoon capers |
| Radishes | 1/3 cup mayonnaise |
| | Lemon wedges |

Drain tuna and salmon, turn onto plate lined with salad greens. Arrange potato salad, cucumber, radishes, carrot, olives, onion, and egg around tuna and salmon. Combine capers and mayonnaise. Serve with caper-mayonnaise and lemon. Serve buffet style as a salad or appetizers. Serves 6 as a salad and 12 as appetizers.

BEST FISH BUYS

According to the NMFS National Fishery Education Center in Chicago, the best fish buys for the next week or so are likely to be frozen haddock fillets and frozen shrimp along the Northeast Seaboard; fresh whole fluke and fresh whole croaker in the Middle Atlantic states, including the D.C. area; fresh Spanish mackerel fillets and fresh grouper fillets in the Southeast and along the Gulf Coast; fresh and frozen shrimp and frozen ocean perch fillets in the Midwest; fresh Pacific oysters and frozen prawns in the Northwest; and fresh Dover Sole fillets and Pacific shrimp in the Southwest.

EDS Has Sixth IDOE Report to Distribute Now

The sixth in a series of reports on the progress of the 1970-1980 International Decade of Ocean Exploration (IDOE) has been published by EDS under a National Science Foundation (NSF) contract. IDOE is a multinational cooperative program to improve the use of the ocean and its resources.

The report covers the period April 1976 to April 1977. The text, data inventories, and bibliographies are arranged according to IDOE program subject areas: environmental quality, environmental forecasting, seabed assessment, and living re-

sources. An appendix contains a summary, "Reports of Observations/Samples Collected by Oceanographic Programs."

EDS also is under contract to NSF to manage scientific data collected during IDOE. EDS either has the data and papers described in the reports, or knows where they can be obtained.

Requests for copies of the reports, or for IDOE data, should be addressed to the National Oceanographic Data Center, Environmental Data Service, 3300 Whitehaven St., NW, Washington, D.C. 20235.

Book Explores Carbon Dioxide Fate in Oceans

The question of how the carbon dioxide content of the oceans affects the atmosphere, climate, and environment is explored in *The Fate of Fossil Fuel Carbon Dioxide in the Oceans*, a 749-page report of a symposium held early this past year by the Ocean Science and Technology Division of the Office of Naval Research.

Edited by Neil R. Andersen of the National Science Foundation and Alexander Malahoff, Chief Scientist with the

National Ocean Survey, the book examines the consequences of the growing concentration of carbon dioxide in the oceans.

The publication contains 33 specific papers delivered at the University of Hawaii, Jan. 16-20.

Copies of *The Fate of Fossil Fuel Carbon Dioxide in the Oceans* may be purchased for \$35 each from Plenum Press, 227 West 17th Street, New York, N.Y. 10011.



Participants in the Local Warning Radar (WSR-57) Training Course held August 30-September 22, at the NWS Technical Training Center in Kansas City, Mo., were: (Standing left to right) Harold E. Lowman, Concordia, Kans.; Robert Merritt, Mobile, Ala.; Stuart Peterson, Ralston, Nebr.; Dan Mondella, Meridian, Miss.; Robert Hazzard, Oakville, Conn.; Ralph E. Carter, South Boston, Va.; Joe R. Kelley, Cowgill, Mo.; Stanley M. Levine, Altamont, N.Y.; Art Talamantes, San Angelo, Tex.; Joel Wertman, Instructor. (Seated left to right) Alfred G. Bollig, Edson, Kans.; Samuel A. McNeil Jr., Endicott, N.Y.; Ira S. Brenner, Glendale, Ariz.; Kenneth A. Holmes, Augusta, Ga.; Jerry O'Bryant, Abilene, Tex.; Ann Chipman, Cheyenne, Wyo.; Bobby R. Phillips, Clover, S.C.; Robert Grebe, Instructor.

National Oceanic and Atmospheric Administration

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