



# noaa week

Volume 7

Number 33

August 13, 1976

## Lippold Heads NOS Fleet Ops.

R. Adm. Herbert R. Lippold, Jr., has been appointed Associate Director of the National Ocean Survey's Office of Fleet Operations. He has been Director of the Pacific Marine Center in Seattle, Wash., for the past three years.

The Office of Fleet Operations is responsible for management of the NOAA Fleet, which currently comprises 25 ships ranging in size from the 73-foot coastal fishery Research Vessel George M. Bowers, to the 303-foot deep-ocean survey and scientific research sister ships Discoverer and Oceanographer.

(Continued on page 2)

## Hurricane/Storm Surge Reminders Issued

Once again—now that people are spending more time at beaches and along the shores, and since it is also hurricane season—the National Weather Service is issuing reminders about hurricanes and storm surge—the hurricane's greatest killer.

The storm surge is a great pile-up of wind-driven water—often as much as 50 miles wide, and up to 25 feet high—that comes sweeping across the coastline in that area where the hurricane makes its landfall. Along with hammering waves, the surge acts like a giant bulldozer—flattening buildings in its path.

The NWS recommends evacuation when the area you're in is threatened, unless you're positive you are on high enough ground to escape this rising wall of water.

In some coastal areas, population growth has made the evacuation problem critical. Evacuation route capacities have been exceeded and backup precautions such as seeking refuge in high-rise buildings may be necessary.

Some other things you can do when a hurricane threatens, according to the Weather Service, are:

Know your community's hurricane preparedness plan.

## Satellite Photos Help Estimate Hurricane Rainfall

NOAA hurricane forecasters this year are testing a new method for predicting the difference between destructively wet hurricanes like Agnes (1972), Fifi (1974), and Eloise (1975), and relatively dry ones.

The experimental technique estimates hurricane rainfall potential from cloud images transmitted by one of NOAA's geostationary satellites, operated by the National Environmental Satellite Service. The spacecraft is in an earth-synchronous orbit that keeps it always 22,250 miles (35,800 kilometers) over the same point on the equator.

This hurricane season, rainfall estimates derived from satellite pictures of approaching storms will be flashed from the National

(Continued on page 4)

## Scientists Measure Ozone In Martian Atmosphere

As Viking scrutinizes Mars from the planet's surface, earth-bound scientists have found a way to measure at least one Martian characteristic from millions of miles away—ozone in the atmosphere. They believe their discovery will permit long-distance studies of Martian weather.

The researchers, Drs. John F. Noxon of the Environmental Research Laboratories' Aeronomy Laboratory, Wesley A. Traub and Nathaniel P. Carleton of the Smithsonian Astrophysical Observatory and Pierre Connes of France's National Center of Scientific Research, were able to detect ozone's presence by its effects on other, more observable, constituents of the atmosphere.

Using powerful telescopes at Mt. Hopkins, Ariz., and Mt. Palomar in California, they de-

(Continued on page 4)

## Murino Named NWS Executive Affairs Chief

Vincent S. Murino has been named Chief of the Executive Affairs Staff in the Office of the Director of the National Weather Service. He previously served as Executive Officer to the Director of the Systems Development Office.

Mr. Murino's NWS career began in 1951 at St. Louis, Mo., where he served at both the airport and river service offices. He transferred to Washington, D.C., in 1952, worked for a brief time as an analyst with the Office of Hydrology, and in 1953, moved to the Extended Forecast Division, NMC, where he was an analyst and Technical Assistant. In 1959, he was named Chief of the Weather Bulletin Section of the Office of Meteorology and Oceanography.

Since 1964 he has been with

(Continued on page 3)

## Paula Consolini Is NOAA Administrator In Girls/Boys Nation Bicentennial Session

Paula M. Consolini, of Southington, Conn., was chosen to serve as the Administrator of NOAA in the first Bicentennial Joint Session of Girls/Boys Na-

tion, the youth citizenship training course in the processes of Federal Government of the American Legion and its Auxil-

(Continued on page 4)

## Cannon Is NMFS Conservation Coordinator

Kessler R. Cannon has been named to the post of Conservation Coordinator of the National

Marine Fisheries Service. He will have primary responsibility for conservation relations for the agency at the national level, working closely with the environmental community on matters of mutual concern.

For seven years he was Assistant to Governor Tom McCall of Oregon for natural resource and environmental affairs, and during the past year served as an Oregon State University professor, teaching natural resource and environmental management.

In announcing his appointment, NMFS Director Robert W. Schoning stated that Mr. Cannon

(Continued from page 2)



R. Adm. Lippold



Mr. Cannon



**PARTICIPANTS IN A CONFERENCE OF PRINCIPAL ASSISTANTS** of the National Weather Service Forecast Offices in the Central Region, held recently in Kansas City, Mo., were (from left) Bill Waldheuser, St. Louis, Mo.; Lee Larson, River Forecast Center, Kansas City; Fred Ostby, National Severe Storms Forecast Center, Kansas City; Maury Pautz, Denver, Colo.; Perry Baker, Des Moines,

Iowa; Mike Franjevic, Bismarck, N. Dak.; Gale McQuate, Cheyenne, Wyo.; Don Stoltz, Sioux Falls, S. Dak.; John Curran, Topeka, Kans.; Al Bangert, Omaha, Nebr.; Gordon Thiel, Detroit, Mich.; Gordon Wylie, Indianapolis, Ind.; Doyle Cook, Louisville, Ky.; Al Morrison, Milwaukee, Wis; and Paul Swope, Chicago, Ill.

## Survey Underway In Michigan

A five-month geodetic survey has been started in south-central Michigan to provide geodetic control along the proposed Interstate 69 and other major transportation routes in a 1,000 square-mile area.

The survey is a cooperative program between the Michigan Department of State Highways and Transportation and the National Ocean Survey and will be conducted in Lansing and portions of Ionia, Calhoun, Jackson, Shiawassee, Ingham, Eaton and Clinton counties.

NOS surveyors will determine approximately 50 geodetic positions of latitude and longitude, with State personnel establishing subsidiary points in the immediate vicinity of planned or existing transportation routes. Measurements of elevation will be accomplished by a joint effort of the NOS and State personnel within the project area. The cooperative agreement between the NOS and the State of Michigan provides for the on-the-job training for State employees in geodetic survey methods.

## Adm. Lippold

(Continued from page 1)

Adm. Lippold will direct fleet activities from NOS headquarters in Rockville, Md., through the Atlantic Marine Center in Norfolk, Va., and the PMC.

Since beginning his commissioned career as a ship's watch officer in 1950, he has served aboard eight vessels, three of which he commanded; as Chief of the Satellite Triangulation Division in Rockville, where he played a key role in the establishment of a worldwide satellite triangulation network; with geodetic field parties in various states; and on other assignments which have taken him to Honolulu, Hawaii; Ft. Pleasant, W. Va.; and the Arctic coast.

He received a bachelor of science degree from New England College, Henniker, N.H., and a civil engineering degree from the University of New Hampshire.

## calendar of events

- Aug. 29-Sept. 3  
Aspen, Colo.  
1909 K St., N.W., Washington, D.C. 20006. 202-331-0370.)
- September 10-14  
Southwestern Oregon  
Oregon Department of Geology and Mineral Industries. (Cynthia Beadling, AGU, 1909 K St., N.W., Washington, D.C. 20006. 202-331-0370.)
- September 12-17  
Raleigh, N.C.  
International Conference on Photochemical Oxidant Pollution and Its Control, sponsored by the U.S. Environmental Protection Agency and coordinated by the Triangle Universities Consortium on Air Pollution (TUCAP). (Mrs. Ernestine McIver, Administrative Secretary, TUCAP, P.O. Box 2284, Chapel Hill, N.C. 27514. 919-966-1515.)
- 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.  
(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.)
- September 10-25, 1977  
Australia  
Downunder 77, the Fifth World Underwater Congress of the Confederation Mondiale des Activites Subaquatiques, 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 (A\$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.)

## Hurricane/Storm Surge

(Continued from page 1)

emergency lighting for use should electricity fail.

Keep your car's gas tank full. Otherwise you may run out of fuel when you really need it. Filling stations may be closed as the storm approaches and pumps may be inoperative afterwards.

Plan a safe, sure evacuation route to high ground inland for use in case your area is threatened. Know where hurricane shelters are located.

Know in advance if your residence can be reached by a hurricane storm surge.

Determine what valuables and other items should be taken if you must leave. Don't forget pets. Travel light.

If you are advised to evacuate, shut off household electrical power at the main switch and water at a main valve (where it enters your house)...and leave immediately.

Use caution in attempting to cross flooded areas. Flooding may undermine roads making them unsafe to drive on.

## Cannon (Continued from page 1)

non's job is to "ensure that the NMFS is aware of the concerns of environmentalists and conservation organizations, and that they in turn know about our efforts in the entire range of conservation of our marine resources."

Mr. Cannon is a native of Oregon, and a graduate of the University of Oregon.

## 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 submitted copy in conformity with policies of the paper or the Administration.

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

## R.I. Awarded CZM Grant

Rhode Island has been awarded a \$2,779 six-month grant to enable it to complete final details and processing on a coastal management program. Under the grant terms, the State will add \$96,390 in matching funds.

The grant gives Rhode Island additional time for processing its program, designed to achieve optimum use and management of the State's 419-mile coastline. The program will serve as a master plan in guiding future coastal growth in a rational and coordinated manner.

A draft of the management program has been forwarded to the Office of Coastal Zone Management for preliminary review. At the end of July, Rhode Island held a public hearing on the draft management document, which the State hopes to adopt and submit for approval. If approved, the Rhode Island program would become the second in the Nation to receive such approval, and the State would become eligible for management funds under the Coastal Zone Management Act of 1972.

The first Federal program approval was awarded to the State of Washington in June.

To help Rhode Island develop its program, OCZM has granted it nearly \$800,000 while Rhode Island has added about \$400,000 in matching funds. The bulk of the current grant will be used to assist the Coastal Resources Management Council, the Coastal Resources Center at the University of Rhode Island, and the Department of Natural Resources in maintaining and updating the draft plan.

## Two Scientists Analyze the Role of Oceans in Heat Transport

Ocean currents carry more than water; they are in effect a mass transit system for heat.

Two scientists have recently completed the most thorough investigation ever done on how heat energy from the sun is distributed around the earth, and found that the oceans transport much more of this heat than anyone had thought.

Drs. Abraham H. Oort of the Environmental Research Laboratories and Thomas H. Vonder Haar of Colorado State University analyzed the heat balance of the northern hemisphere, making quantitative estimates of how much heat is gained, lost, and stored by the atmosphere and ocean each month of the year in 10-degree latitude belts.

Dr. Oort, a researcher at the Geophysical Fluid Dynamics Laboratory at Princeton, and Dr. Vonder Haar based their conclusions on thousands of temperature measurements in the atmosphere and oceans collected by other researchers from satellites, ground stations, and oceanographic vessels.

The data included satellite

**Murino** (Continued from page 1) the SDO, where he served as a systems analyst; Chief, Communications Branch; and Chief, Program Planning and Coordination Staff, before becoming Executive Officer in 1973.

He received a B.S. and M.S. in meteorology from St. Louis University and an M.A. in public administration from The American University. He is a member of the American Meteorological Society, American Geophysical Union, Washington Operations Research Council, Sigma Xi, and Pi Mu Epsilon.

measurements of reflected sunlight and infrared (heat) radiation from earth for 1964 to 1971; five years of daily atmospheric temperature measurements taken by balloon at about 600 stations throughout the northern hemisphere; and all the ocean temperature observations on record at the Environmental Data Service's National Oceanographic Data Center.

From this data the two scientists formulated representation of the earth's heat balance that includes how much heat enters the top of the atmosphere, is stored in the atmosphere and oceans, transported by oceanic and atmospheric circulation, and interchanged between atmosphere and earth—the ocean, land, ice, and snow.

The atmosphere and oceans serve as reservoirs, storing heat during summer and releasing it during winter, thereby evening out seasonal differences. Winds and currents transport huge amounts of heat from warm to cold regions, smoothing out the climate in a geographical sense. Thus the oceans and atmosphere exert a moderating influence. Without them, the climate everywhere on earth would be harsher than it is; winters would be cold-

er and summers hotter.

The heat budget analysis showed that from September through February the northern hemisphere loses heat; the rest of the year it is warming. It also revealed that heat storage in land, snow, and ice is relatively small when compared with that in the atmosphere and oceans.

The researchers also found a surprisingly large variation in heat storage and movement with seasons.

"The oceans undoubtedly form the most important medium to store heat, at least on a seasonal time-scale," the researchers report.

In general, both the atmosphere and oceans seem to transport heat from whichever hemisphere is in summer to the winter hemisphere. Oceanic transports are of major importance south of 40 degrees latitude, and are strongest between 10 and 20 degrees. There, in spring and fall, the oceans transfer some 5,000 trillion watts of heat northward. In winter, the transports are weaker and occur farther north. One major feature that the researchers noted is a strong convergence of heat between 45 degrees and 60 degrees north latitude in winter.

## Eloise Environmental Data Compiled

On September 22 and 23, 1975, hurricane Eloise passed over environmental data collecting buoys EB-04 and EB-10 (which are operated by the NOAA Data Buoy Office) in the north-central Gulf of Mexico.

Eloise, accompanied by 110-knot winds and 16-foot storm tides, slammed ashore over the Florida Panhandle, leaving \$100 million worth of damage in her wake. The buoys, providing hourly readings, monitored the deepening storm's vital signs just 12 hours prior to landfall. In addition, observations before and after the storm's passage allowed a measurement of the environment's response to the hurricane.

Recognizing the research potential of the data buoy observations, NOAA has prepared a package containing both the buoy and supporting data for the marine portion of hurricane Eloise's life. The joint efforts of the Environmental Data Service, National Weather Service, National Environmental Satellite Service, National Ocean Survey, and Environmental Research Laboratories, as well as those of the U.S. Army Corps of Engineers, have produced an extensive environmental data package.

Though it varies for some parameters, the basic observational period extends from September 15, when Eloise entered the Caribbean Sea, through September 28, five days after landfall. Most data is on magnetic tape, but microfiche and micro-

film were used where appropriate.

The heart of the Eloise data package is the EB-04 and EB-10 data, which are available on magnetic tape and in an NDBO data report. The data include such surface and subsurface parameters as winds, waves, current, air and sea temperatures, along with other meteorological and oceanographic measurements. Supporting data include surface and subsurface observations (expendable bathythermograph) from cooperating merchant ships. Surface and upper-air weather charts and land station records also have been collected. Film and digital information are available from a satellite and radars. Detailed aircraft reconnaissance observations at 10-second intervals also are available. Sea state photographs, radar film, and aircraft expendable bathythermograph records are included. Tropical cyclone advisories and bulletins are in the package, which also includes coastal flooding information in the form of storm-surge data for tidal stations and high-water mark measurements along the coast.

The data were assembled by the EDS' National Oceanographic Data Center and National Climatic Data Center, and NCC's Satellite Data Services Branch. Requests for data or information on the package should be directed to the Environmental Data Service, National Oceanographic Data Center, Code D762, Washington, D.C. 20235; telephone 202-634-7394.



A DISPLAY OF RESEARCH AIRCRAFT at the airport in Broomfield, Colo., was one of the hardware highlights of the International Cloud Physics Conference and the Second World Meteorological Organization Scientific Conference on Weather Modification, which met in Boulder in two recent consecutive weeks.

Among the specially instrumented planes shown was this Cessna 207 equipped with a doppler lidar (laser radar) for measuring wind velocities. Dr. Ronald Schwiesow (second from right) and his colleague at the Environmental Research Laboratories' Wave Propagation Laboratory developed the sensor, which can be installed in the plane belonging to Dr. Peter Sinclair of Colorado State University. This month, Dr. Schwiesow and Dr. Sinclair (second from left) will use the airborne lidar to study waterspouts off the Florida Keys. On the left is Dr. Seka Achv, University of Abidjan, Ivory Coast; and Dr. R. K. Kapoor, Indian Institute of Meteorology, is on the right.

## CG Radio Station Given NWS Award

A National Weather Service Public Service Award was presented recently to the U.S. Coast Guard Radio Station in Long Beach, Calif., in appreciation of the excellent cooperation the Coast Guard has shown in transmitting forecasts and advisories and collecting observations for NWS use. The award was presented, on behalf of NWS Director Dr. George P. Cressman, by Robert W. Schoner, Marine Program Leader at NWS Headquarters in Silver Spring, Md., and Anthony Rippe, Port Meteorological Officer at San Pedro, Calif., and accepted by Cdr. Russ Dounicy, Commanding Officer of the Long Beach Facility.

The ceremony took place at the NWS Forecast Office in Los Angeles, Calif., which was represented in the ceremony by Don Lust.

### Ozone

(Continued from page 1)

tected the faint radiance emitted by excited oxygen molecules on Mars, betraying the presence of ozone. Since the amount of ozone in an atmosphere is related to temperature and water vapor, ozone measurements are a key to weather observations.

The presence on Mars of gaseous ozone, a triatomic form of oxygen, had eluded much closer scrutiny. Mariner 9, which orbited the planet in 1971 and 1972, had detected ozone at the winter pole of Mars, but could not tell directly whether it was gaseous ozone in the atmosphere or frozen into the ice cap (though other experiments suggested that it was in the atmosphere). Because of severe space limitations, neither of the two Viking spacecraft carries an ozone sensor.

The technique Drs. Noxon, Traub, Carleton and Connes used is indirect, but unequivocal. "What we actually saw in the Martian atmosphere," said Dr. Noxon, "was the infrared radiance caused by excited oxygen molecules." These are produced when sunlight breaks up an ozone molecule. By measuring the brightness of these emissions, the researchers could calculate the amounts of excited oxygen and, therefore, the amount of ozone.

The group's measurements indicate that, as on earth, ozone in the Martian atmosphere is thin near the surface and densest at high altitudes.

"What we've done is show that it's feasible to monitor ozone, and these other properties, from earth," concludes Dr. Noxon. "Not just anyone can do it—you need a big telescope and a good spectrometer." The researchers had used a 60-inch (1.5-meter) reflector at Mt. Hopkins and the giant 200-inch (5-meter) telescope at Mt. Palomar.

## notes about people



**Mr. Lehrer**      **Mr. Cooper**  
George H. Cooper and Hugo V. Lehrer were appointed recently to new assignments at EDS' National Climatic Center in Asheville, N.C.

Mr. Cooper has been named Chief, Administrative and Technical Services Division, following an assignment with the National Ocean Survey from 1971 to 1976 as Administrative Officer for the Office of Marine Technology. He first joined the National Weather Service under the Management Intern Program as a Budget Analyst. He holds both bachelor's and master's degrees in Economics from the University of Tennessee.

Mr. Lehrer has been named Chief, Cooperative Data Branch, Data Operations Division, at the Center. He received his training in meteorology at the University of Chicago, and joined NCC in

### Satellite Photos Help Estimate Rainfall

(Continued from page 1)

Hurricane Center in Miami, Fla., to the National Weather Service river forecast offices. There, computer models of river basins in the path of hurricanes will use the information to predict probable flooding and flash-flooding. NHC Director Dr. Neil Frank explained, "we've known for years that some hurricanes are wetter than others, but this will be the first time we've had a tool for getting that difference into our warnings."

"We're excited about the new technique because, if we can give our River Forecast Centers realistic rainfall forecasts, they can make excellent predictions of river flooding. The importance of timely flood warnings ahead of hurricanes was dramatically illustrated by Agnes in 1972 and Eloise last year."

Rainfall estimates for 1976 Atlantic hurricanes will be prepared where the technique was developed—at the Environmental Research Laboratories' National Hurricane and Experimental Meteorology Laboratory.

According to NHEML Physicist Cecilia Griffith, the satellite method of estimating rainfall was formulated jointly by scientists in Miami and their colleagues at the University of Wisconsin's Space Science and Engineering Center. The method is a by-product of the Florida Area Cumulus Experiment, or "FACE."

1961 after serving as the NOAA State Climatologist for Oklahoma. He earned a bachelor's degree in mathematics from Moorhead State Teachers College, Moorhead, Minn.

**Marvin Miller** has been appointed Meteorologist in Charge of the Weather Service Forecast Office at Cleveland, Ohio. For the past two years he has been the MIC at Charleston, W. Va.

With the NWS since 1960, he has served as a Briefer-Observer at Indianapolis; Forecaster in the former Weather Bureau Resources Laboratory in Cincinnati, Ohio, and Chief Forecaster in the National Air Pollution Potential Forecast Program there; State Climatologist for Ohio at Columbus and Meteorologist in Charge at the Columbus WSO; and MIC at Wilmington, N.C. Earlier he was an Air Force Weather Officer.

He graduated from Bowling Green State University, Ohio; received training in meteorology at



**Mr. Miller**

Texas A&M; and completed his master's degree in meteorology at the University of Michigan.

Lt. Cdr. John W. DeCoste has been named Commanding Officer of the NOAA Ship Kelez. The ship carries a normal complement of seven officers, a crew of 19 and six to eight scientists, and has a sea-going range of 7300 miles.

The 177-foot former fisheries research vessel was reconditioned and newly equipped in 1974 to conduct ecology studies in coastal areas in the Atlantic and Gulf of Mexico. She is in her third year of a five-year ecology study of the New York Bight, the first coastal area to be studied under NOAA's MESA (Marine Ecosystems Analysis) program.

Since becoming a NOAA officer in 1971, Lt. Cdr. DeCoste has served aboard the NOAA Ships Oceanographer, Rainier, and Whiting, and was Operations Officer of the Lake Survey Center in Detroit, Mich.

He received his B.A. degree from the University of Ottawa, Canada, and spent about ten years in the U.S. Navy before joining NOAA.

### Paula Consolini

(Continued from page 1)

ary. The duties and responsibilities of Dr. Robert M. White, NOAA Administrator, were outlined to Miss Consolini by Associate Administrator Dr. John W. Townsend, Jr., when she visited NOAA's Rockville, Md., Headquarters last week.

The 17-year-old Southwestern High School senior's activities have included service as National Junior Honor Society President; Home Room and Student Council Representative; Junior Prom Co-Chairman; Treasurer of the Keyette and Future Nurses Clubs; and Manager of the girls' tennis team.

### 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 fresh flounder fillets and canned tuna along the Northeast Seaboard; gray sea trout and croaker in the Middle Atlantic States, including the D.C. area; speckled trout and grouper in the Southeast and along the Gulf Coast; whiting and fresh pollock in the Midwest; fresh oysters and red snapper fillets in the Northwest; and fresh oysters and snow crab in the Southwest.

# **National Oceanic and Atmospheric Administration**

## **ERRATA NOTICE**

One or more conditions of the original document may affect the quality of the image, such as:

Discolored pages  
Faded or light ink  
Binding intrudes into the text

This has been a co-operative project between the NOAA Central Library and the Climate Database Modernization Program, National Climate Data Center (NCDC). To view the original document, please contact the NOAA Central Library in Silver Spring, MD at (301) 713-2607 x124 or [Library.Reference@noaa.gov](mailto:Library.Reference@noaa.gov)

HOV Services  
Imaging Contractor  
12200 Kiln Court  
Beltsville, MD 20704-1387  
July 23, 2010