

NOAA REPORT



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May 1994

Public Hearing on Sound Experiment Set: NMFS will hold a Santa Cruz, Calif., hearing May 16, to address public concern and gain additional scientific information about the effects of a proposed ocean sound experiment on the marine environment there. The Monterey Bay National Marine Sanctuary will cosponsor the hearing.

The Scripps Institution of Oceanography, in La Jolla, Calif., has applied for two scientific research permits to allow it to harass several species of marine mammals and sea turtles for two years with low frequency sound transmissions and assess the effects on these species. The ocean sound experiment is aimed at investigating changes in ocean temperature associ-

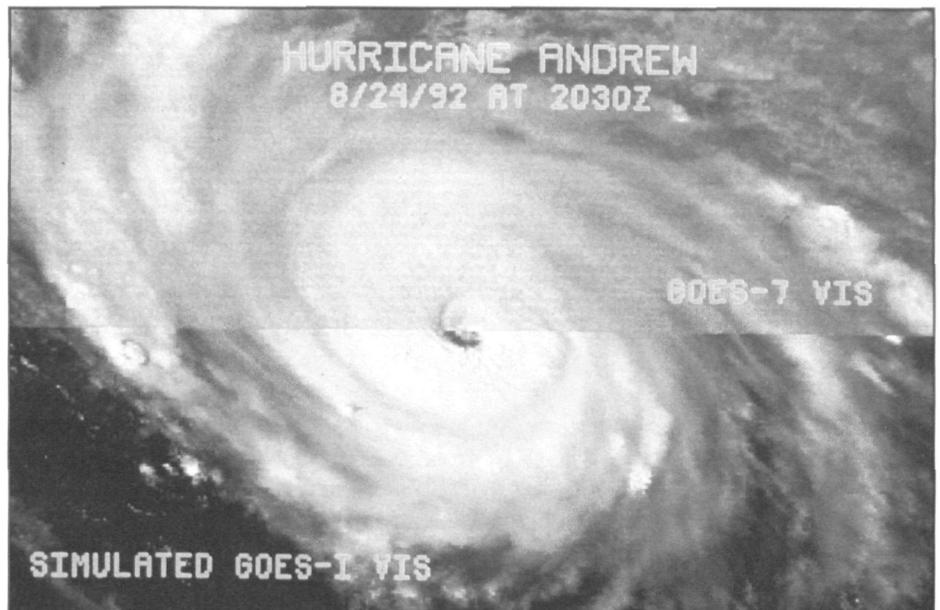
NEWS BRIEFS

ated with global warming. One sound source site is proposed off Point Sur, Calif., in the Monterey Bay National Marine Sanctuary, and the second off the north coast of Kauai, Hawaii. The Advanced Research Projects Agency, the organization funding the proposed experiment, has asked the fisheries service for a 60-day extension of the public comment period for the California experiment while its researchers gather additional environmental information there.

Salmon Management Plans in Place: Strict fishing management measures that will limit West Coast salmon fishing and eliminate ocean fishing for coho salmon during 1994 to prevent further depletion of stocks have begun.

The Pacific Fishery Management Council recommended the regulations to NMFS last month. The regulations severely cut back the seasons for ocean fishing off Washington, Oregon and northern Califor-

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This split image shows Hurricane Andrew as seen from GOES-7 (top) along with a simulation of the view from NOAA's GOES-I, which was launched last month. GOES-I can distinguish 1024 shades of gray in visible cloud images, while earlier GOES satellites can see no more than 64 shades. This enhanced capability will allow forecasters to track smaller storm features with greater accuracy.

GOES Environmental Satellite Successfully Launched

GOES-I, the first in a series of five advanced environmental satellites to be launched over the next several years, was successfully launched on April 13 from Cape Canaveral Air Force Station, Fla.

The Geostationary Operational Environmental Satellite, named GOES-8 since achieving orbit, will provide more precise and timely weather observation and atmospheric measurement data. Its three-axis stabilized design allows the satellite sensors to continuously stare at the earth for 24-hour observation. Current spin-stabilized satellites view the earth only five percent of the time.

While NOAA owns and operates the GOES series of satellites, the National Aeronautics and Space Administration's (NASA) Mission to Planet Earth manages the design, development, and launch of the spacecraft. Once the

satellite operationally goes through "check-out," NOAA will assume responsibility for command and control, data receipt, and product generation and distribution.

Operational in 180 Days

During check-out, GOES-8 will be positioned at 90 degrees West longitude. After 180 days, GOES-8 becomes operational. Plans call for GOES-7 to be moved from 112 degrees West to 135 degrees West. GOES-7, launched seven years ago, is still operational, but has outlived its expected lifetime. GOES-8

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GOES-I, First Advanced Satellite, Launched

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will eventually be moved to 75 degrees West.

The next satellite in the GOES series, GOES-J, is planned for launch in April 1995. It will replace GOES-7,

DC, Md. Sites Connected

The Benefits of Getting Wired

NOAA's Systems Division has just completed installation of the first Washington metropolitan area fiber optic network in the Department of Commerce. The network connects the Hoover building in downtown Washington, the NOAA campus in Silver Spring, and NOAA offices in Germantown, Md., with high speed fiber optic technology provided through Bell Atlantic.

The installation provides multiple benefits including the combining of many local area networks (LANs) into a single virtual LAN, expanding connectivity to other agencies and locations, and providing a flexible and reliable communications path for high speed applications.

Same Cost, Major Increase in Speed

The cost of this technology is equivalent to that of standard inter-network connections, but at one hundred times the speed. No additional new equipment was required to set up this service, which is based upon "plug and play" technology. "This new service combines high performance with reliability and cost-effectiveness," said project manager Rob Swisher.

The fiber network connects the three NOAA sites into a single unified network. Databases, applications, files, programs and network services that now reside separately at each of these three NOAA locations, can now be consolidated onto one server and directly accessed by anyone as if the systems were in the next office.

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which is planned to be used as a backup. The next three satellites in the GOES series will be launched as required to support NOAA's dual-satellite geostationary observing system.

The GOES I-M satellites are built by Space Systems/Loral. NASA's Lewis Research Center is responsible for launch services, provided on an Atlas I rocket, under contract with General Dynamics.

The GOES series of satellites is owned and operated by NOAA's National Environmental Satellite, Data, and Information Service.

Two Previous Failures

The last two satellites launched for NOAA, NOAA-13, a polar orbiter, and Landsat 6, an earth-resources satellite, both failed. Controllers lost contact with NOAA-13 twelve days after it was launched in August, and Landsat 6 never reached orbit. GOES-G was destroyed as a result of a launch vehicle failure in 1986. Since 1991, NOAA has been using a Meteosat satellite, borrowed from EUMETSAT, the European Organisation for the Exploitation of Meteorological Satellites, for east coast weather coverage. ☺

(For more on GOES and NOAA's other satellites, see page 4.)

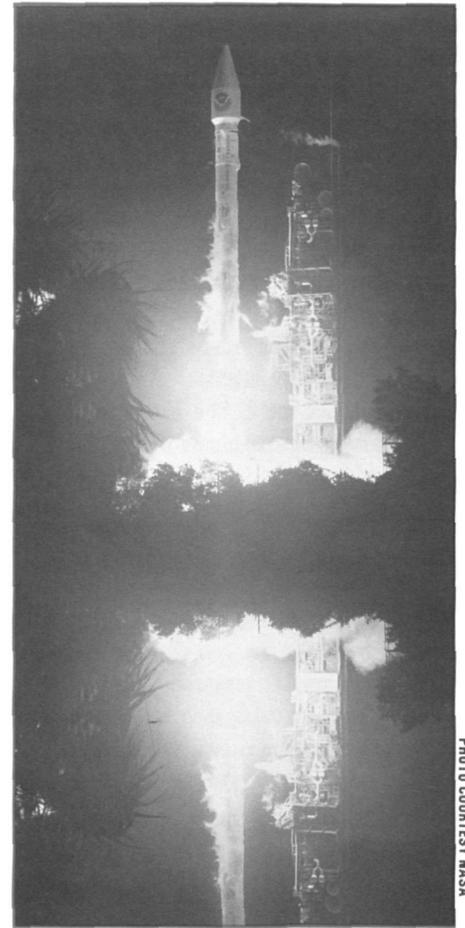


PHOTO COURTESY NASA

GOES-I blasts off into the Florida night sky from Cape Canaveral aboard an Atlas 1 rocket.

Students Go to Florida for a Blast (Off)

When GOES-I, the first in a series of five advanced weather satellites, was launched from Cape Canaveral Air Force Station, Fla., on April 13, a group of students from Unionville High School, Unionville, Pa., was there to see it off.

The students, from Helen Martin's Earth and Space Science classes, have been tracking weather satellites and studying data directly from the satellites in their classroom. Robert S. Winokur, NOAA's assistant administrator for satellite and information services, had invited the students to the launch.

The students, who paid their own travel and hotel expenses, said it

was well worth it. "I'm incredibly excited that I will be able to share in NOAA's latest accomplishment," said senior Chris Wood. "Our satellite tracking system will be using the data GOES-I has to offer. Congratulations to NOAA's leadership team for a job well done."

"I feel extremely honored to have been invited to share in NOAA's triumph during the launch of GOES-I," said junior Katherine Powell. "It was a wonderful experience for me and all the more enjoyable because I know that I will be using the information sent back."

—Pat Viets ☺

African-Americans' Concerns Aired

Diversity in NWS Studied at Workshop

Seeking to increase the number of African-American employees in mid- and upper-level management positions, weather service officials held the second of a series of workshops recently to focus on diversity in the workplace, attracting nearly 260 NWS employees from across the country.

At the workshop, NWS Assistant Administrator Elbert "Joe" Friday Jr., asked participants to propose ways of increasing diversity in the workplace and removing the barriers that inhibit African-Americans from advancing into mid- and upper-level management. "I am surprised that a bias in the rating system within NOAA exists," said Dr. Friday. "However, when I saw the data, it confirmed that it does."

According to that data:

- ❖ Of NOAA's total 13,521 permanent workforce, 9.1 percent are African-American.
- ❖ Of NOAA's total 3,765 GS/GM-13 and above permanent workforce (including the Senior Executive Service), 4.6 percent are African-American.
- ❖ Of NOAA's total 5,106 mission-related science or "core" permanent workforce, (including meteorologists, oceanographers, cartographers, engineers, fishery biologists, and mathematicians), 3.4 percent are African-American.

A recent survey of NOAA African-American employees indicates that job satisfaction, promotion potential and participation in Personnel Management Advisory Committee boards are their top workplace concerns. "The survey indicated that African-American employees feel that affirmative action is necessary and should continue," said survey team chair Carl McCalla.

The workshop included working groups reviewing the issues of recruitment and retention; management of the workplace, including an examination of discrimination in hiring and promotion as well as African-American responsibility to make equal employment opportunity



NOAA Administrator D. James Baker and workshop co-chairs John E. Jones, Jr., and Margaret McCalla listen as Dr. Elbert "Joe" Friday discusses the importance of enhancing advancement opportunities for NOAA's African-American employees.

work; and professional development.

The plenary session included self-portraits of success related by NWS, NESDIS, NOS, and NMFS employees; a panel of high school and college students and their mentors, NOAA professionals, discussing the benefits of the practice; and a discussion led by representatives of historically black colleges and universities on methods for developing formal education opportunities for African-American youth.

'Being Heard' a Top Priority

"Two main concerns surfaced repeatedly in the Recruitment and Retention session," said Barbara Tobe, a co-chair of that working group. "First, NOAA should increase its funding for special mission-related projects to historically black colleges and universities in an effort to provide a continued source of young scientists for NOAA; and second, retaining good employees includes the concept of being heard by top management—including the possibility of rating supervisors by employees."

"NOAA needs to be held more accountable for the number of all minorities in upper-level management," said workshop co-chair John E. Jones, Jr.,

deputy Meteorologist-in-Charge at the Mt. Holly, N.J. forecast office, which covers the Philadelphia metro area. "Even senior managers acknowledge that there is poor representation. NOAA needs to develop a formal mentoring program and a formal mid-level management development program for employees who are grades 13 through 15. Through temporary assignments in such programs, individuals can gain invaluable training and experience."

About the workshop results, he commented, "I was struck by the number of workshop participants who vowed to recommit themselves to furthering their careers while also reaching back to help others."

NOAA Mentors and Their Students

One of the workshop highlights was the mentor-student panel discussion on mentoring. One of the panel members, LaKyetta Rodgers, a senior at Frederick Douglass High School in Upper Marlboro, Md., who has been working part-time at NESDIS as a computer analyst since July 1993, said, "I've learned a lot about computer applications from Martin

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Focus On...

NOAA's Weather Satellites

Operating the country's system of environmental satellites is one of the major responsibilities of the National Oceanic and Atmospheric Administration. NOAA's National Environmental Satellite, Data, and Information Service (NESDIS) operates the satellites and manages the processing and distribution of the millions of bits of data and images these satellites produce daily. The prime customer is NOAA's National Weather Service, which uses satellite data to create forecasts for television, radio, and weather advisory services. Satellite information is also shared with various Federal agencies, such as the Departments of Agriculture, Interior, Defense, and Transportation; with other countries, such as Japan, India, and Russia, and members of the European Space Agency (ESA) and the United Kingdom Meteorological Office; and with the private sector.

NOAA's operational weather satellite system is composed of two types of satellites: geostationary operational environmental satellites (GOES) for short-range warning and "now-casting" and polar-orbiting satellites for longer-term forecasting. Both kinds of satellites are necessary for providing a complete global weather monitoring system.

A new series of GOES and polar-orbiting satellites is being developed for NOAA by the National Aeronautics and

Space Administration (NASA). The new GOES-I will provide higher spatial and temporal resolution images and full-time operational soundings. The polar-orbiting meteorological satellites will provide improved atmospheric temperature and moisture data in all weather situations. This new technology will give the National Weather Service the most advanced weather forecast system in the world.

GOES

GOES satellites provide the kind of continuous monitoring necessary for intensive data analysis. They circle the Earth in a geosynchronous orbit, which means they orbit the equatorial plane of the Earth at a speed matching the Earth's rotation. This allows them to hover continuously over one position on the surface. The geosynchronous plane is about 35,800 km (22,300 miles) above the Earth, high enough to allow the satellites a full-disc view of the Earth. Because they stay above a fixed spot on the surface, they provide a constant vigil for atmospheric "triggers" for severe weather conditions such as tornadoes, flash floods, hail storms, and hurricanes. When these conditions develop, the GOES satellites monitor storms and track their movements.

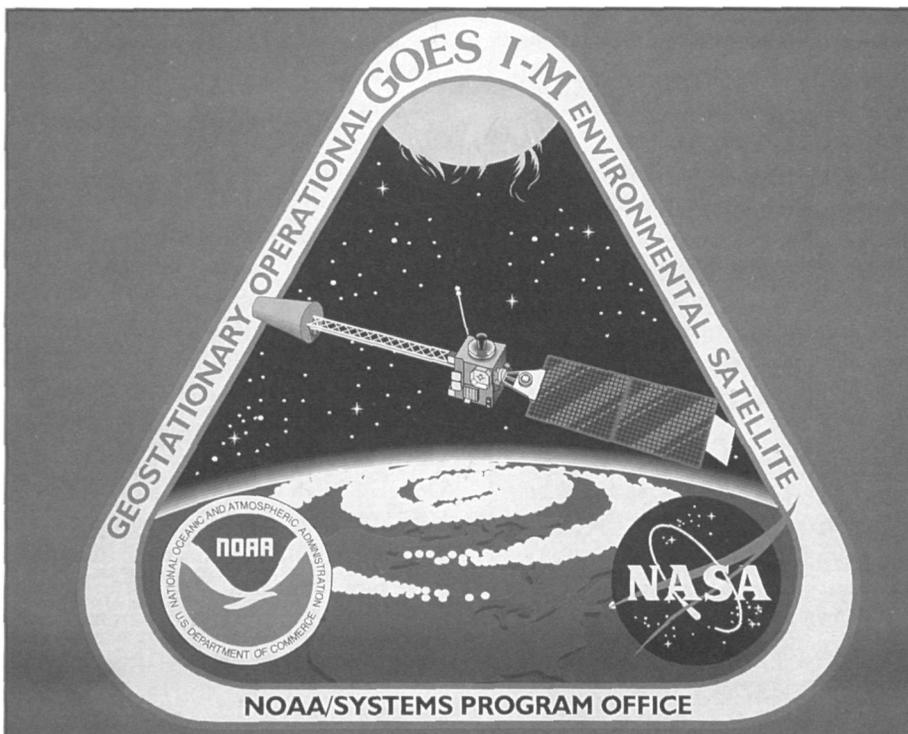
GOES satellite imagery is also used to estimate rainfall during thunderstorms and hurricanes for flash flood warnings, as well as estimate snowfall accumulations and overall extent of snow cover. Such data help meteorologists issue winter storm warnings and spring snow melt advisories. Satellite sensors also detect ice fields and map the movements of sea and lake ice.

NASA launched the first GOES for NOAA in 1975 and followed it with another in 1977. Currently, the United States is operating GOES-7, which is supported by Europe's Meteosat-3, and will launch GOES-I in April 1994 and GOES-J in 1995.

GOES-7, METEOSAT-3, AND GOES-I

The United States normally operates two meteorological satellites in geostationary orbit over the equator. Each satellite views almost a third of the Earth's surface: one monitors North and South America and most of the Atlantic Ocean, the other North America and the Pacific Ocean basin. The two operate together to send a full-face picture of the Earth, day and night. However, with the failure of the GOES-6 in 1989, the United States had only one operational satellite, GOES-7, which was repositioned midway over the United States.

In August 1991, Meteosat-3 was moved from 5 degrees West to 50 degrees West over the equator to



supplement NOAA's GOES system. In February 1993, it was moved to 75 degrees West. Meteosat-3 was launched in 1988 and served as Europe's operational satellite until June 1989 when it was replaced by Meteosat 4. It was developed for and operated by, the ESA on behalf of the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT).

The United States will reap many benefits from the April 1994 launch of GOES-I as it begins to aid forecasters in providing better advanced warnings of thunderstorms, flash floods, hurricanes, and other severe weather. Improved forecasts will save lives, preserve property, and benefit agricultural and commercial interests.

The GOES-I will provide meteorologists and hydrologists with detailed weather measurements, more frequent imagery, and new types of atmospheric soundings. The data gathered by GOES-I, combined with that from new Doppler radars, will make possible a revolutionary flood and water management system devised by National Weather Service hydrologists, greatly aiding water resource managers as they make critical decisions about allocating precious water resources, particularly those of the western states.

POLAR-ORBITING SATELLITES

Complementing the geostationary satellites are two polar-orbiting satellites known as advanced Television Infrared Observing System (TIROS) satellites. Constantly circling the Earth in sun-synchronous orbit (450-mile altitude), these satellites support large-scale, long-range forecasts. The satellites circle the Earth in an almost north-south orbit, passing close to both poles. One crosses the equator at 7:30 a.m. local time, the other at 1:40 p.m. local time. Operating as a pair, these satellites ensure that data for any region of the Earth are no more than six hours old.

The polar orbiters monitor the entire Earth, tracking atmospheric variables and providing atmospheric data and cloud images. They track weather patterns that affect the weather and climate of the United States. The satellites provide visible and infrared



Artist's rendering of a GOES series satellite in orbit, 22,300 miles above the Earth.

radiometer data that are used for imaging purposes, radiation measurements, and temperature profiles. The polar orbiters' ultraviolet sensors also provide ozone levels in the atmosphere and are able to detect the "ozone hole" over Antarctica during mid-September to mid-November. These satellites send more than 16,000 global measurements daily to NOAA's Command and Data Acquisition (CDA) station computers, adding valuable information to forecasting models, especially for remote ocean areas, where conventional data are lacking.

Currently, NOAA is operating two polar orbiters: NOAA-11, launched in September 1988, and NOAA-12,

launched in May 1991. NOAA-J is scheduled for launch in late 1994, with follow-on models launched as needed in subsequent years.

How Satellites Are Named

NOAA assigns a letter to the satellite before it is launched, and a number once it has achieved orbit. For example, GOES-H, once in orbit, was designated GOES-7. GOES-G, which was lost at launch, was never assigned a number. The same system is used for polar orbiters; for example, NOAA-11, now in orbit, was designated NOAA-H before launch.

—Janet Amber 

Full Groundfish, Scallop Plans Begin

Virtually all of the provisions of two comprehensive, government-approved plans to help restore depleted stocks of scallops and groundfish off New England, originally scheduled to go into effect March 1, began on May 1.

The groundfish plan, known as Amendment 5, is aimed at protecting badly overfished stocks of haddock, cod and yellowtail flounder, tradition-

ally the backbone of the multi-million-dollar New England fishing industry. The scallop plan, known as Amendment 4, has a similar goal.

The plans include a phased-in reduction of days at sea for vessels, new vessel registration requirements, rules to protect harbor porpoises and larger mesh openings for fishing nets. 

NOAA CELEBRATES EARTH WEEK



NOAA and the Department of Commerce celebrated Earth Week last month by sponsoring a number of ceremonies and events.

Above, NOAA Administrator D. James Baker addresses a crowd at Commerce Department Headquarters during the Earth Week kickoff.



Left, Baker, Commerce Secretary Ron Brown, and NOAA Chief Scientist Kathryn Sullivan answer questions from sixth graders from Maryland's Ft. Washington Forest Elementary School.

Right, Brown and Baker check weather forecasts from around the country through a special hookup to NOAA Weather Radio broadcasts nationwide. The forecast radio network was slated for expansion by Vice President Gore after the Palm Sunday tornadoes that struck the south in March (see NOAA Report, April 1994).



Research Could Improve Flight Safety

A NOAA research scientist is developing a climatology of clear air turbulence at high altitudes that could improve flight safety for airline passengers.

Gary Ellrod of NOAA's Satellite Applications Laboratory is basing the climatology on an index calculated from upper level winds in a global forecast model. He studied turbulence in the Northern Hemisphere at and above typical airline flight altitudes of 30,000 to 35,000 feet. The study was designed to provide guidance to aviation weather forecasters and to assist in air route planning.

Ellrod found that areas at risk for high altitude clear air turbulence are remarkably consistent with respect to

location from year to year based on preliminary data.

Extensive High-Risk Zones

Several extensive east-west zones of high risk for clear air turbulence are present across the middle latitudes in winter, from December through February. These zones include the southwestern United States, the Canadian Maritimes, the north central Pacific, eastern China and Japan, and North Africa to Southwest Asia. These are regions where strong jet streams often converge, and winter cyclones are frequent.

However, there is a dramatic decrease in clear air turbulence during the Northern Hemisphere summer (June through August) and a northward shift in occurrence. This is caused by a weakening of the jet streams and fewer storm systems.

Another finding indicates that higher altitudes (above 35,000 feet) tend to be slightly less turbulent, on the average.

Risk of Injury

Significant turbulence is strong enough to force a passenger against the seat belt and poses risk of injury. In rare cases, damage to aircraft may occur. For air travel, this would mean that for a daily flight from Atlanta to Los Angeles in winter, one of every four flights could expect to encounter significant turbulence.

Study to Continue

The turbulence index is based on the vertical wind shear between two altitudes, and horizontal stretching and compaction, both important factors in producing clear air turbulence. This index is used daily by aviation meteorologists in the United States and Canada for short range forecasts. For the climatology study, this index is then averaged over long periods of time (monthly, seasonally and annually) to show regions where the turbulence is more likely to be found. The index does not account for turbulence caused by either thunderstorms or mountain waves, which are localized phenomena. The study will likely continue for several more years, resulting in a global climatology of clear air turbulence. ☺

Fiber Optics Link DC, Md. Sites

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Instant Internet Access

In addition to providing high speed/low cost/low maintenance data transfer between the Hoover building and DoC facilities in the Washington metro area, the fiber network will also provide instantaneous access to the Internet, as well as video services. This effort is a component of Vice President Gore's National Information Infrastructure (NII) or the information super highway program. John Villemarette, chief of NOAA's Systems Division, said that "without this service we would not be able to help the High Performance Computing and Communications Office perform its educational and research programs in support of the NII."

The Systems Division is currently working on a cooperative arrangement with NASA to connect the fiber optic network to NASA's Goddard Space Flight Center in Greenbelt, Md. ☺

Florida's Rookery Bay Estuarine Reserve Wins Environmental Education Award

The Rookery Bay National Estuarine Research Reserve received Florida's 1994 Environmental Education Award for its outstanding environmental education program.

Florida Governor Lawton Chiles, Lt. Governor Buddy MacKay and the Environmental Education Foundation of Florida recognized the reserve at Florida's Earth Day celebration at Walt Disney World last month.

Focus on Students, Teachers, Public

The Rookery Bay NERR program targets high school and college students, teachers, adults and environmental professionals with hands-on, issue-oriented programs. The goal is to

educate the public on current research findings and resource management techniques so they can make informed decisions concerning coastal issues; and to help them understand the economic and sociological value of the resources by showing the connection between the resources and their own lives.

Rookery Bay NERR is one of 22 sites within a national system of research reserves established by Congress through the Coastal Zone Management Act of 1972 to be protected as natural laboratories for research and education. National Estuarine Research Reserves are jointly administered by NOAA and individual states and territories. ☺

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nia. The management measures for the central California salmon season, however, will be less restrictive due to the relatively healthy Sacramento River fall chinook salmon runs there.

The regulations trigger a complete closure of the non-Native American ocean salmon season north of Cape Falcon, Ore., to Canada, but allow restricted commercial and recreational fishing for all salmon except coho salmon in Federal waters south of Cape Falcon. A limited chinook salmon harvest that allows tribal trollers to catch a limited number of chinook salmon off northern Washington will be allowed.

Clinton Signs Mammal Act: President Clinton signed into law the Marine Mammal Protection Act amendments on April 30, the day a one-month stopgap extension of the interim exemption for commercial fisheries expired. It passed both the House and Senate on April 26. The law

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signed by the President extends the MMPA through Fiscal Year 1999.

New NMFS Office: A new Office of Environmental Policy has been established in NMFS's northwest region. The new office will develop policy regarding wild anadromous fish, partnerships for Federal and non-Federal management of species, Endangered Species Act consultations, and special initiatives, such as President Clinton's Forest Plan, and negotiations with Canada.

"Salmon management has significantly changed with the advent of listings of these fish under the Endangered Species Act and with the other initiatives, such as President Clinton's Forest Plan," explained Gary Smith, acting northwest NMFS regional director. "Our reorganization will meet the challenges of these changes and will provide better for the salmon and for the needs of the public. It gives us the best way to identify species needs, to resolve problems for all parties, to understand and hear the public's concerns, and to develop rational positions and decisions." ☺

Centers Open to Help N.E. Fishing Families

The Clinton Administration, members of the New England Congressional delegation, and state and local officials announced last month the opening of four Fishing Family Assistance Centers to provide aid to economically impacted fishing families in the Northeast.

NOAA officials, along with officials from the Department of Labor and the Small Business Administration were joined by regional members of Congress, and state and local officials in two separate events, in Portland, Maine, and Gloucester, Mass.

The Fishing Family Assistance Centers are an important element of the \$30 million Federal program announced by Secretary of Commerce Ronald H.

Brown on March 21 to help alleviate the Northeast fisheries crisis.

The four permanent Fishing Family Assistance Centers will be established in Gloucester, New Bedford and Provincetown, Mass., and in Portland. In addition, two mobile centers will cover eastern Maine, New Hampshire, Connecticut, Rhode Island, New York and New Jersey.

'One-Stop' Federal Assistance

"These one-stop shops will serve as centers where fishermen can inquire about the range of Commerce, Labor, SBA, and other Federal, state, and local assistance programs available to them," said Douglas Hall, NOAA's assistant secretary for oceans and atmosphere. ☺

Diversity Workshop Stresses Recruitment

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[Predoehl, a NESDIS meteorologist]. My main task has been using a database to locate certain physical features and taking photographs of those images. Last summer, during the Midwest floods, I was able to see the rivers rising and falling." LaKyetta will graduate from high school next month and will begin working on her bachelor's degree in nuclear engineering at the University of Maryland at College Park this fall.

"I feel that to have gotten mentored at such an early age had a very positive impact on my life," she said. "Even though it hasn't influenced my direct career choice, it has given me the initiative to make the right choices. It feels good to work in an atmosphere in which I am treated as an equal in the company of adults."

Education Opportunities

Another high point was the presentation given by Professors Isabella Finkelshtein and Melvin Webb of Clark Atlanta University, Atlanta, Ga., on developing formal education opportunities for African-American youth. One of their programs provides primary and secondary school students with science laboratory activities on a college campus every Saturday; another program encourages college freshmen to strive for doctoral degrees in the sciences.

Workshop co-chair Margaret McCalla, of NOAA's Office of Policy and Strategic Planning, was impressed by the number of employees who registered for the workshop. "I was pleased with the mix of participants," she said. "Although the workshop focused on employees who perform NOAA's 'core' operations, administrative and clerical employees also attended. What really impressed me most was the level of participation from top DoC, NOAA, and NWS managers. The fact that these managers came and *stayed* showed their interest and commitment to diversity in the workplace." ☺

—J.A. ☺

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