NOAA REPORT

Vol. III, No. 4 April 1994

Opportunity for Sport Divers to Explore the *Monitor:* Proposals from concessionaires interested in managing recreational diving at the Monitor National Marine Sanctuary, site of the sunken Civil War ironclad warship *U.S.S. Monitor*, are now being accepted. Up to this point, NOAA has only granted permits for research dives at the Monitor sanctuary site. In recent years, increasing numbers of sport divers have requested permission from NOAA to dive to the *Monitor*, but the *Monitor*'s 230-foot depth and surrounding strong currents require special preparation and dive procedures.

NOAA will accept proposals for a concessionaire who will be responsible for planning and conducting the dives, as well as assuring that the *Monitor* and its contents are not damaged by any activities. If the initial effort is successful, special use permits could be issued on a regular basis in the future.

NEWS BRIEFS

Jade Collection Prohibition Reconfirmed: Responding to a request by jade collectors to change the regulation barring the removal of the gemstone from the Jade Cove area south of Big Sur, NOAA will uphold its regulation prohibiting exploration, development, or removal of oil, gas or minerals from the Monterey Bay National Marine Sanctuary off California.

In maintaining the regulation as written, NOAA continues its commitment and responsibility to protect sanctuary resources while allowing full access to the site by divers and other visitors. NOAA's position is consistent with the state law that was in effect prior to the sanctuary designation and with the U.S. Forest Service prohibition on the removal of jade from the Los Padres National Forest.

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March tornadoes that killed 45 people prompted Vice President Al Gore (above) to announce an expansion of NOAA Weather Radio, making the service available to 95 percent of the Nation and making receivers "as common as smoke detectors" in high-risk areas.

Tornadoes Prompt Action

Gore Calls For Expanded Weather Radio Network

Last month's devastating Palm Sunday tornadoes, which killed 45 people across the Southeast, have led to the planned expansion of the NOAA Weather Radio network to cover 95 percent of the Nation, up from the current 75 percent.

Vice President Al Gore announced the plan, and the formation of an interagency emergency task force, at a March 31 press conference at Commerce Department headquarters. Also at the press conference, which was covered by national media, were NOAA Administrator D. James Baker, NWS assistant administrator Elbert "Joe" Friday, Agriculture Secretary Mike Espy, Federal Emergency Management Agency director James Lee Witt, and Commerce Deputy Secretary David Barram. *(For Gore's remarks, see story, page 2.)*

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Gore's Remarks at Press Conference

The following is an edited transcript of Vice President Gore's remarks at a March 31 press conference on NOAA Weather Radio:

I want to begin by expressing my thanks to the individuals on the staffs of the three Cabinet Departments and the agencies involved in this announcement this morning, because worked all day long yesterday and through most of the night to get ready for this announcement this morning. And yesterday, when we were in Goshen [Alabama], [Agriculture] Secretary [Mike] Espy and [Federal Emergency Management Agency] director James Lee Witt and I were riding around Calhoun County, on the telephone to Jim Baker at NOAA here in the Commerce Department, and the four of us reviewed what was involved and what might be possible on short notice. And, of course, a great deal of work has been done during the last several months to bring us to this point.

And as a direct response to the heartfelt pleas of those families in Calhoun County, Alabama—and others in Georgia, where 17 people lost their lives in the same series of weather events; in Tennessee, where four people lost their lives; in North Carolina, where two people were killed—in response to the heartfelt pleas for better warning in rural areas that are not presently covered by the severe weather warning system, we are making this announcement today.

'COURAGE AND GRACE'

I want to echo what Secretary Espy said about how moved we were by the courage and grace of those individuals with whom we met in Goshen, Alabama. In the midst of their tragic loss, they were busy about the business of comforting their neighbors. In the case of Reverend Kelly Clem, she and her husband, Reverend Dale Clem, were comforting the parishioners of the church that suffered so much damage and where so many people lost their lives. [The Clems lost their 4-year old daughter in the collapse of the Goshen Methodist Church during the storm.]

But one of the points they wanted to emphasize most of all is their hope that the Nation could learn from this tragedy and find a way to prevent other similar tragedies from happening in the future. So that's what we're doing here today.

First, let me make this point: We now have NOAA weather radio locations. But...you'll see that Goshen is in an area that is in between the coverage areas of the NOAA weather radio. You can also see that there are a lot of other blank spaces that are not presently covered.

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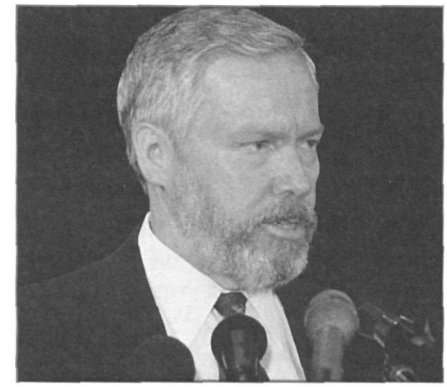

Weather Service chief Dr. Elbert "Joe" Friday answers questions at the press conference.

Expand Weather Radio Network: Gore

continued from page 1

The expanded network, which will add 100 radio transmitters to the 350 now in place, will also now broadcast all types of disaster warnings, such as hazardous material spills, in addition to severe weather warnings.

Radios To Be Placed in High-Risk Areas

The special weather radios, which cost from $25 to $200 at electronics stores, receive National Weather Service broadcasts over one of seven frequencies. Certain radios can turn themselves on when NOAA Weather Radio broadcasts a special warning signal. Gore said that both the Federal government and private business groups will help to place the self-activating radios "where people gather, and ultimately in homes, so that in high risk areas they will soon be as common as smoke detectors."

Gore visited the site of the most deaths from the tornadoes, the Goshen Methodist Church in Piedmont, Ala., just after the tragedy. Although the Weather Service issued a tornado warning 20 minutes before touchdown, that information did not get to many in the affected areas. "The difficulty that we had was...people aren't always listening to their commercial radios or televisions," Friday explained. "They don't have them on or they're doing other things." The self-activating radios should alleviate that concern, he added.

At last count, approximately eight million radios capable of picking up the broadcasts are in use across the country.

Disaster Survey Team Sent

Shortly after the tornadoes swept through the Southeast, the National Weather Service formed a six-member National Disaster Survey Team. The team's fact-finding mission to the stricken areas began in Alabama on March 29 and wrapped up in Georgia four days later. The team reviewed the forecasts and warnings prepared by Weather Service offices in Birmingham, Ala., and in Atlanta and Athens, Ga. The team's science unit conducted aerial and ground surveys of the tracks of the tornadoes, examined the destruction and reviewed the meteorological details of the event.

A separate services unit gathered information on the dissemination of warning and forecast information to local emergency managers, media outlets and the communities at large. The team then assembled for three intense days to begin writing the Disaster Survey Report. The report will summarize the event, report findings and make appropriate recommendations for improving weather service.

—Jerry Slaff & Barry Reichenbaugh ❖

Hurricane, '92 Tornado Reports Released

Accuracy of Andrew Warnings Lauded

Timely, accurate warnings by the National Weather Service resulted in the relatively low loss of life during Hurricane Andrew's August 1992 rampage across Florida and Louisiana, according to a report released by the weather service last month.

Wind, not storm surge (tide and wind-driven water) was the major cause of direct deaths, the report shows.

The 183-page report about the Nation's most costly disaster ever focuses on teamwork between NOAA and emergency managers. It identifies strengths and weaknesses in the warning systems and provides a performance analysis of Federal, state and local members of the hazards community.

Gusts to 175 MPH

The disaster survey research team confirmed that Hurricane Andrew generated winds of 145 mph with gusts over 175 mph, and a storm surge of more than 16 feet. It was rated as a category 4 (out of 5) storm on the Saffir-Simpson scale. The storm produced $25 billion in physical damage and crippling economic losses, though human casualties were surprisingly few.

About 126,000 houses were destroyed or damaged and 9,000 mobile homes demolished in Florida. In Dade County alone, Andrew left at least 160,000 people homeless and 86,000 out of work. Much of the area's infrastructure—airports and electric utilities—in Homestead and Florida City was destroyed. The National Guard provided tent shelters and other essentials.

In Florida, 15 deaths were directly attributed to the storm. An additional 29 fatalities were caused by electrocutions, cleanup accidents, fires, and other incidents associated with the recovery.

In Louisiana, eight direct and nine indirect fatalities occurred. Louisiana lost about 3,300 single family, multifamily and mobile homes, and more than 18,000 units received some damage.

Prediction Error Rate Down

The survey report notes that "NOAA performed exceptionally well prior to and during Hurricane Andrew." The error rate in predicting the hurricane's track was 30 percent less than average. Lead times on hurricane watches and warnings were three to six hours better than average. Hurricane watches were issued with 35 hours of lead time in South Florida and 43 hours in Louisiana. Hurricane warnings were issued with 21 hours lead time in Florida

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Varanasi to Lead NMFS NW Center

Usha Varanasi, head of NMFS's environmental conservation division in Seattle, has been named director of the agency's Northwest Fisheries Science Center, replacing Rolland Schmitten, who became head of the fisheries service.

Varanasi becomes the first woman to head one of the fisheries service's nine major field installations. The center provides scientific and technical support to NMFS on coastal ecosystem health, the Endangered Species Act, and on the management, conservation and development of fisheries resources.

During her six-year tenure as director of the environmental conservation division at the center, Varanasi led a team of more than 80 researchers examining the nature and extent of coastal pollution in the United States and its effect on the health of the marine ecosystem.

Her team developed vastly improved technology for treating petroleum contamination which was used extensively following the *Exxon Valdez* and Persian Gulf oil spills.

Varanasi received her bachelor's degree from Bombay University, India, in 1961, a master's degree in chemistry from the California Institute of Technology in 1964, and a doctorate in 1968 from the University of Washington, Seattle. ❖

National Science & Tech Week Coming

NOAA has participated annually with the National Science Foundation in National Science and Technology Week, created by NSF in 1985 to foster public understanding of science and technology and an appreciation of the role scientific and technological research and education play in our everyday lives.

Designated nationally as the week to celebrate the wonders of science and technology, April 24-30, 1994 provides NOAA an opportunity to share its strides toward global environmental stewardship with Federal, state and local officials, the general public, private industry, educators, and others.

Join the various NOAA offices in their activities during the last week in April to promote Science and Technology Week. Some of the events planned are: open houses and exhibits at the NMFS Panama City Lab April 29-30, a tour for D.C. students of the World Weather Building and the Satellite Services Division, an exhibit highlighting NOAA and the Information Highway in an Information Technology Showcase in the atrium of the NSF Building, Ballston, Va., April 28-29, a symposium in which government officials and representatives from the private sector address the question of access to the Information Highway April 28 in the Arlington Renaissance Hotel.

For more information on National Science and Technology Week, contact Tamela Graham in NOAA's Office of Public and Constituent Affairs at (202) 482-6090

Focus On. . .

NOAA & the Internet

As NOAA staffers explore new ways to restore and preserve the Earth's natural environment, exchanging information and new ideas in support of NOAA's mission, they are turning more and more to the Internet for help.

The Internet is an interconnected network of about 12,000 separate computer networks that span the globe, connecting more than 16 million people. About 20 years ago, the Defense Department developed the technology from which the Internet evolved, which was intended to support the sharing of human and computer resources. Since then, university and government researchers have further developed, refined, and expanded it, making Internet's uses and possibilities so attractive that commercial users now comprise about half of its connections.

NOAA Administrator D. James Baker considers the Internet a key tool for disseminating information. "Internet is the enabling technology of the future," he says. "It gives NOAA the means to offer immediate public access to weather data as well as to our latest scientific research, and provides a convenient forum for our scientists to collaborate on projects and share information with other scientists across the globe. I'm excited about what we have accomplished already with Internet within NOAA, and plan to have this resource more widely available as quickly as possible."

The Information Superhighway of Today

Internet is the current implementation of the eagerly anticipated national information superhighway. It enables access to and sharing of a wide variety of information—text, pictures, sounds, even video. It allows users on opposite sides of the world nearly instant contact with each other through electronic mail. University, government, industry, and even individual databases can be put online and accessed by anyone connected. Files on just about anything, from NOAA satellite images to the complete texts of Shakespeare's plays, can be located, transferred and downloaded from one computer to another—easy even for non-computer experts to do now with network information discovery and access tools newly available. Researchers at different locations can share information and communicate with each other using their work stations. You can even find out if a Coke machine at Carnegie Mellon University in Pittsburgh has any soda in it, and whether it's cold or not. And individuals at home or work can use their computers to participate in discussion groups on subjects of interest ranging from the obscure to the bizarre. The possibilities are practically limitless.

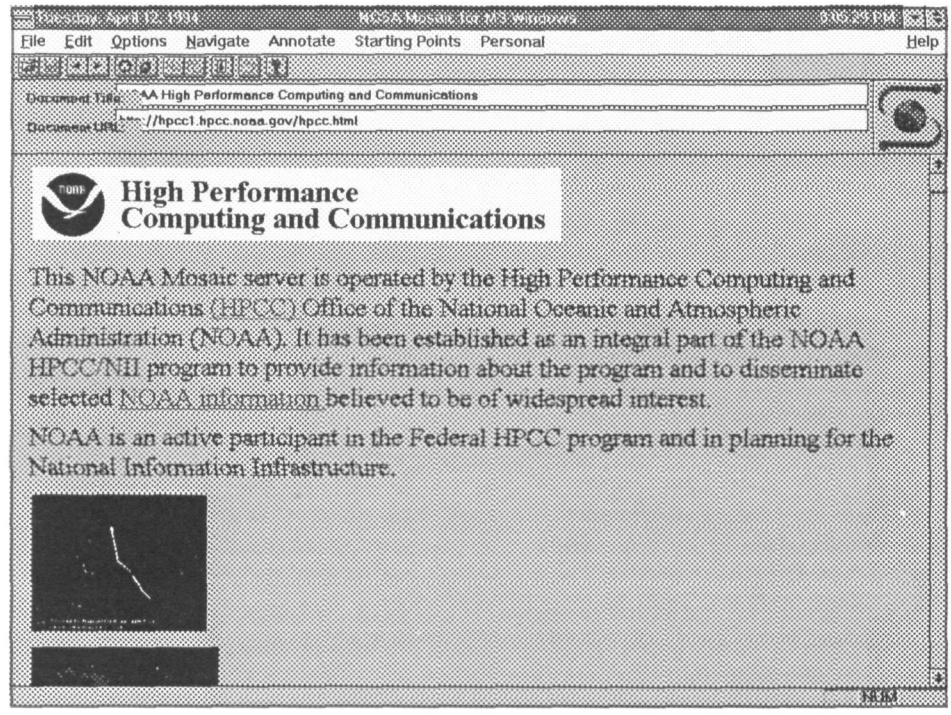
So how, exactly, does NOAA fit into all this?

NOAA is at the forefront of the Federal government's rapidly expanding use of the Internet. NOAA's Tom Pyke is director for High Performance Computing and Communications (HPCC), a billion dollar research program coordinated by the National Council on Science and Technology and involving 10 Federal agencies to support and implement the national information superhighway—a high priority presidential initiative featured in the President's State of the Union address. NOAA's HPCC office has programmatic responsibility for NOAA's expanding use of the Internet.

NOAA to Be 'A Leading Disseminator'

Pyke envisions NOAA as a leading disseminator of information to the private sector, educators, researchers and the general public via the Internet. "We've barely started, but NOAA has already become one of the most substantial information providers in the government," he said. "It's growing so fast, we're trying to keep ahead of people using it."

More than 3,500 NOAA computers, from PCs to supercomputers, are now connected to the Internet. Users come from a wide spectrum of careers, from



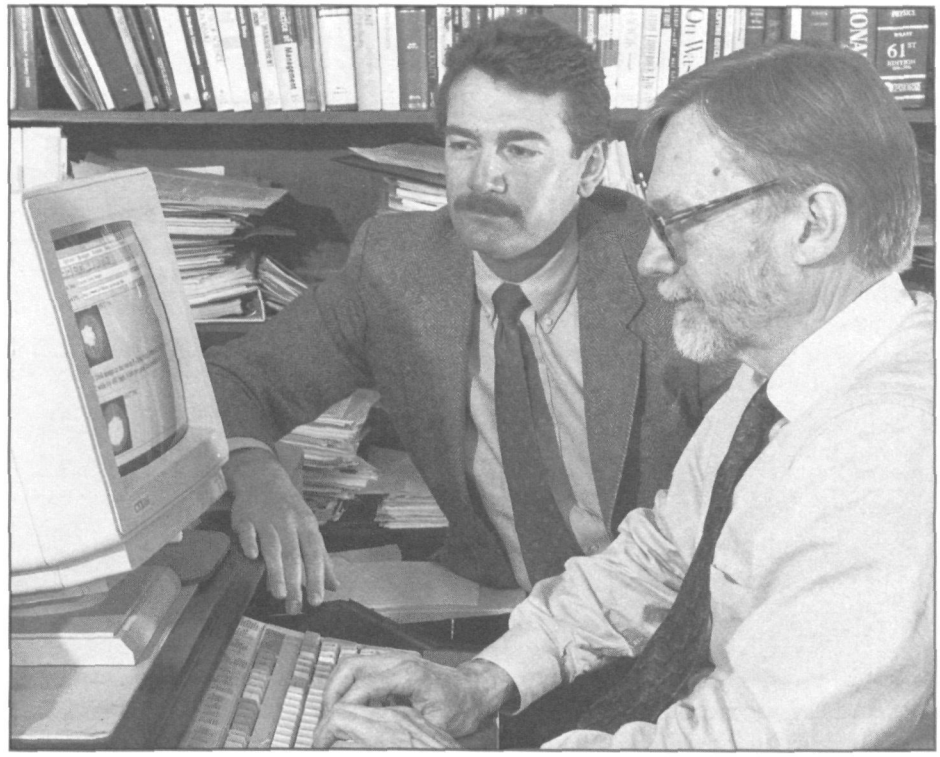
Black-and-white does not do justice to this NOAA Mosaic High Performance Computing and Communications Home Page.

scientists to secretaries to computer "techies." Some NOAA researchers have been using Internet for years to communicate with colleagues. But with higher speed connections and advances in technology, software, gateways, and availability, use of Internet within NOAA has virtually exploded over the past six months. Employees at all levels are discovering Internet as a tool that can help them do their jobs better.

With the rapid expansion of Internet within NOAA, systems specialists are devoting more attention to finding and providing Internet software, configuring access for NOAA offices, and managing its use.

Dramatic Demand Growth

According to Rob Swisher, chief of NOAA's Systems Support Branch in Rockville, Md., "The demand for Internet has grown so dramatically that a fifth of our time is now spent on Internet-related issues and applications. But we are able to cover the demand through the dedication of our technical staff. Human, managerial, and organizational issues are a greater problem than technical issues as far as being able to fully support and train everyone on the new applications on the Internet." Swisher's group, however, is encouraging and supporting people within its area of responsibility—NOAA's headquarters offices—in the use of Internet by offering a series of workshops to demonstrate its different features. Also, anyone in headquarters who has an Internet address can send Internet electronic mail through the Banyan network.



NOAA Systems Support director Rob Swisher (left) shows D. James Baker, NOAA administrator, how to get on the Internet.

To get the full range of Internet services *(see glossary, left)*, computers connected to a NOAA Internet server should have a 486 or better PC, Windows, Internet software, and an assigned Internet address.

23 Internet Servers

With the heavy involvement of HPCC and support of NOAA's leadership, great strides are being made in making Internet available to more and more users both inside and outside NOAA. NOAA has established 23 computer-based information servers on the Internet, with the latest access and navigation tools to help make NOAA information conveniently accessible. Ten of these systems, called "Mosaic servers," provide multimedia, integrated access to both real time and historical information. The primary NOAA Mosaic server, which contains a top level view of NOAA called the "NOAA Home Page," has been developed by the NESDIS

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What's What on the Internet?

Here are some of the terms you'll need to know when using Internet:

File Transfer Protocol (FTP): A program run on the Internet to transfer files from one computer to another. Files can be anything from reports to computer programs.

Gateway: A server (host, router, etc.) that provides a connection to the Internet.

Gopher: A distributed document delivery service designed to tunnel through networks to retrieve documents—hence the name, a play on *go for* and the small animal. An Internet Gopher Server accepts simple queries, and responds by sending the Gopher client a document. This document can be a text file, graphic image, sound file, etc.

Mail: The service used by the largest number of Internet users that allows you to send and receive messages. A recent development lets you attach binary data, voice messages, video, or pictures to an ordinary e-mail message.

Mosaic: An information browser that allows you to discover, retrieve, and display documents from the huge universe of information on Internet servers worldwide. Through Mosaic, you can access all available Internet tools, including hypertext, FTP, and Gopher.

Telnet: A remote login tool that lets you establish a connection across the Internet from one host to another.

Usenet: The most widely used interactive forum with newsgroups (topics) for nearly every subject or interest. Instead of downloading individual files, you automatically receive, and can respond to, messages from individual Internet users on a specific topic to which you join or "subscribe." ❖

Focus On: NOAA & the Internet

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Environmental Information Services office.

NOAA's HPCC office sponsored the creation of a NOAA Network Information Center, or NIC, operated by NESDIS and up and running just last month. The NIC has a wide range of information available to help NOAA staff connect to and use the Internet and find out about resources worldwide. The NIC also provides guidance and centralized support in getting current and complete NOAA environmental data and information on computer systems connected to the Internet. The center's hotline phone number is (301) 763-6503.

The NIC will be the clearinghouse both for information about NOAA's use of the Internet and for NOAA information available through the Internet. It provides an easy way for educators, students, researchers, and the general public to access such information as weather, satellite imagery, space environmental data, and educational materials.

Betty O'Dell, a writer-editor in NOAA's Correspondence Unit, uses Internet to respond to many of the 5,000 inquiries received each year from students, teachers, and the general public. A number of educational publications have already been scanned into the Internet system—on one of NOAA's "gopher" sites *(see box)* and accessible through the NOAA Home Page—in a continuing effort to get as much information on line as possible.

Saves Time and Money

Using the Internet to disseminate information saves time and money, O'Dell says. "Each year we get a number of requests for the same two publications from student teachers at Texas A&M University. We know Texas A&M is connected to the Internet, so once we put those materials on-line, we can tell the teachers to get it off the Internet. Now they won't have to wait two or three weeks for the publications, and the government will save the cost of mailing them," she says.

O'Dell has also begun to explore other government agency resources on the Internet to find answers to constituent questions—thus eliminating the need to make numerous phone calls or forward the correspondence on.

Whatever its growth and change, it's certain that the Internet, and other future networks of the national information superhighway, will revolutionize the way NOAA gives and receives information. With the support and encouragement of top leaders in the White House and NOAA, it's a foregone conclusion that every NOAA employee who can use it in his or her daily work will have access to it in the future.

—Jeanne Kouhestani
(Internet ID: jkouhestani@hq.noaa.gov) ❖

NMFS to Restore La. Wetlands

A joint restoration project that will protect 5,400 acres of wetlands by reducing salt water encroachment into fresh and brackish water marshes on Louisiana's Point au Fer Island will begin this spring.

The $1.1 million project will reestablish natural sediment and freshwater delivery patterns across the island. The project area has been altered by human activities such as petroleum exploration and production. It will be run by NMFS's Restoration Center in cooperation with Louisiana's Department of Natural Resources. ❖

NOAA & the Internet: What's Where?

Ready to start your journey on the information superhighway? Here's a list of the NOAA exits...er, Internet servers, and their addresses:

MOSAIC SERVERS

High Performance Computing and Communications (HPCC)
http://hpcc1.hpcc.noaa.gov/hpcc.html
Environmental Information Services
http://www.esdim.noaa.gov
National Climatic Data Center
http://www.ncdc.noaa.gov
National Geophysical Data Center
http://meridian.ngdc.noaa.gov/ngdc.html
National Oceanographic Data Center
http://www.nodc.noaa.gov
National Marine Fisheries Service
http://kingfish.ssp.nmfs.gov:80/home-page.html
Environmental Research Laboratories
http://beta.erl.gov/erlhome.html
Space Environmental Laboratory
http://www.sel.bldrdoc.gov
Climate Diagnostics Center
http://noaacdc.colorado.edu/cdc/cdc_home.html

GOPHER SERVERS

High Performance Computing and Communications (HPCC)
hpcc1.hpcc.noaa.gov
Environmental Information Services
gopher.esdim.noaa.gov
National Geophysical Data Center
gopher.ngdc.noaa.gov
National Oceanographic Data Center
ariel.nodc.noaa.gov
Arkansas Red River Forecast Center
gopherpc.abrfc.noaa.gov

FILE TRANSFER SERVERS (FTP)

NOAA Network Information Center
nic.noaa.gov
National Climatic Data Center
virga.ncdc.noaa.gov
National Geophysical Data Center
ftp.ngdc.noaa.gov

TELNET-ACCESSIBLE SYSTEMS

NOAA Environmental Data Directory
esdim1.nodc.noaa.gov
(Log in: NOAADIR)
National Climatic Data Center OASIS
hurricane.ncdc.noaa.gov (Log in: storm; password: research)
OSCAR (On-Line Satellite Catalog Request System)
140.90.110.5 (Log in: oscar)

(Editor's note: New NOAA servers are being planned, including one for Public Affairs. You'll be able to access all of NOAA's press releases, backgrounders, back issues of NOAA Report, and many other publications.) ❖

Gore's Remarks at Press Conference

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That can be remedied. And what we're announcing today is an interagency program to extend the coverage area dramatically to cover virtually the entire United States of America.

There is some new technology involved. There are radios that are battery-powered, and can also be plugged in, which can be turned on remotely when there is the need to provide a warning. So that it sits silently in the church or in the community center or in the school or in the home, unnoticed and unheeded, until something like a tornado threatens. And then, with a remote signal, the radio is turned on, it emits a warning tone, and then transmits the information needed for the individuals to take shelter, to move to a safer structure, or to take whatever other action is indicated to protect themselves.

We are also working very carefully with the cable television and telephone industries to develop a public-private partnership to integrate the relatively cheap circuits that are included in these special radios into the National Information Infrastructure. Next week, when the National Information Infrastructure Task Force meets, this new task will be on the agenda.

PHOTO COURTESY TANDY CORP., FORT WORTH, TX.

A self-activating NOAA Weather Radio, available at many electronics stores, will be the centerpiece of the expanded radio network.

"The interagency cooperation that has made this possible is truly stunning," Gore said.

EXPERIMENTAL PROGRAMS BEGUN

The National Weather Service has already begun experimental programs with some cable television companies that result in this technology being used, not in a separate radio but in the television set, so that even when the television is turned off, when there is an urgent severe weather warning, it will come on and provide the information that families in harm's way need to protect themselves.

Priority will be given to the areas that are most at risk, such as communities in Tornado Alley, the area of the country that is at highest risk for tornado damage; such as coastal areas that are most at risk for hurricane damage. And you will notice that there are many areas on the Florida, Georgia, South Carolina coast that are at high risk to hurricane damage that are not presently covered, as they should be, by this technology.

This program that we're announcing today will increase the coverage to 95 percent of the nation by expanding the radio transmitter program under USDA's Rural Development Administration. And I want to especially thank Secretary Espy for the willingness of his department to step forward, in partnership with NOAA and FEMA, to make this happen.

Second, we will aggressively pursue public and private participation in the placement of the NOAA radios where people gather, and ultimately in homes, so that in high-risk areas they will soon be as common as smoke detectors.

As I mentioned, we are also working to build this into the National Information Infrastructure.

NEW APPLICATION FOR NETWORK

In addition, I'm pleased to announce today that FEMA and the National Weather Service have jointly developed a new application for the radios. In addition to severe weather warnings, they will be used to provide warnings for other types of disasters, such as hazardous material accidents; and to provide emergency information to victims of disasters, such as where to get food and shelter, medical services, and the location of disaster application centers.

FEMA, NOAA, the National Weather Service and USDA have formed an emergency task force to implement these goals, to increase protection for all Americans.

One final point. As the folks from the Weather Service will tell you in more detail, they had, through their new prediction systems, adequate warning of the tornado that destroyed this church in Goshen. Instead of two to three minutes' warning that was possible in the past, the new Doppler radar techniques gave 20 minutes of warning. The weak link in the chain was the inability to get the warning information to all of the people in the threatened area on a timely basis, and it is that weak link in the chain that we are fixing with this new initiative announced here today.

The interagency cooperation that has made this possible is truly stunning. ❖

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Search and Rescue Teams Hold First Meeting: Satellite search and rescue coordinators from the United States and South America met in Santiago, Chile, late last month to discuss improving the effectiveness of search and rescue operations through better distribution of alert messages. Participants hoped to produce a unified alert data distribution procedure among American nations using emergency beacons that transmit on a frequency of 121.5, 243.0, and 406.025 MHz. This unified approach will benefit those people in the Americas who are in distress and transmit emergency signals that can be received by the COSPAS and SARSAT satellites.

Vital for coordinating global search and rescue activities, this meeting was a significant event for satellite-aided search and rescue activities in South America. Rescue coordinators want to expand and

NEWS BRIEFS

coordinate ground station coverage in South America and increase the effectiveness of alert data distribution throughout the region.

Sand Point Wins Kudos: NOAA's Western Regional Center at Sand Point has received special recognition for NOAA's participation in the March 1994 "Oil Smart Campaign" in Seattle. The award was for "most effective campaign promotion—first year." Three NOAA employees—Mary Evans, Bill Bohn and Heather Kenney—suggested that the WRC participate in the campaign. They then staged the five Wednesday events with the help of others.

The effective promotional campaign featured special events on each of the Wednesdays in March. including a transportation fair, an effective cycling presentation, theopening of new van/carpool parking spaces, a bike commuters' social and an electric vehicle demonstration. The WRC also established a new bulletin board to assist connecting people who want to start to bicycle or car/van pool. ❖

Hurricane, Tornado Survey Reports Out

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and 36 hours in Louisiana.

The report says that safe shelters from high winds should be designated for area residents; evacuation would involve far too many people to be accomplished effectively.

The report also recommends that local weather service forecast offices issue appropriate warnings and statements for storm-related events, such as tornadoes that occur within hurricanes, and suggests that hurricane intensity forecasting be improved.

Tornado Report Released

In a separate report, a NOAA study assessing the NWS response to the storm that triggered 100 tornadoes sweeping from Texas to the Ohio Valley in November 1992 concluded that modernized weather prediction facilities were a key factor in minimizing human casualties and property damage in most areas.

The 135-page report, *The Widespread November 21-23, 1992, Tornado Outbreak: Houston to Raleigh and Gulf Coast to Ohio Valley,* was prepared by a NOAA disaster survey team following on-site assessments and interviews as part of NOAA's program to look at the performance of its people and technology in warning the public of severe weather.

During 48 hours, the storm system's destructive path left 26 dead, 641 injured and $291 million in property damage. It was the deadliest tornado episode since the Plainfield, Ill., tornadoes that killed 29 people in 1990.

Unusually Intense Storm

The 1992 storm moved eastward and northward from Texas, spawning a destructive and deadly outbreak of tornadoes that affected 13 states before finally dissipating in the mid-Atlantic region. Ninety-four tornado tracks were identified during the widespread episode, which was unusually intense for November.

Rankin County, Miss., suffered the first and largest number of deaths from the storm. A tornado with winds of 207 to 260 mph (F4 category, Fujita scale) devastated a mobile home park in Brandon, killing six. The tornado then leveled a two-story brick home, claiming another four lives. ❖

Great Lakes Lab Fetes Local Students

NOAA's Great Lakes Environmental Research Laboratory (GLERL) in Ann Arbor, Michigan is involved in a number of Great Lakes community education programs. One of those programs is with the Science Department of the Ann Arbor Public Schools' Partners for Excellence Program.

One of the many partnership activities is presenting special awards at the Annual Southeastern Michigan Science Fair for the best aquatic science experiments in the senior and junior divisions and the best aquatic science model or collection in the junior division. Awards were presented by Dr. Alfred Beeton, GLERL director, in a ceremony at the facility in Ann Arbor. This year's winners are:

Dereck DelMonte, age 14, for his project "The Effects of Pesticides on Micro-Organisms in Pond Water."

Aemilia Scott, age 13, for her project "Water Pollution—Natural Resource in Jeopardy."

Allan Hazlett, age 15, for his project "Effects of Crayfish Predatory Behavior on Zebra Mussel (Dreissena polymorpha) Feeding Activity." ❖

NOAA Report is a monthly publication for NOAA employees from the NOAA Office of Public Affairs, Washington.
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☆ U.S. GOVERNMENT PRINTING OFFICE: 1994 301-845/00004

National Oceanic and Atmospheric Administration

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