

NOAA REPORT



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Miss. Company to Build New NOAA Research Ship: NOAA has chosen Halter Marine Inc., Gulfport, Miss., to construct a world class research ship to support several of the agency's critical scientific missions.

The ship will aid NOAA scientists in obtaining critical data and information essential to understanding the greenhouse effect and variations in global climate. The vessel is expected to be built by 1997 and will be the first new NOAA oceanographic research ship since the *Researcher* (later the *Malcolm Baldrige*) was delivered in 1970. The construction of the 274-foot vessel marks a major step in NOAA's fleet modernization program to replace its aging vessels with ships able to conduct ocean

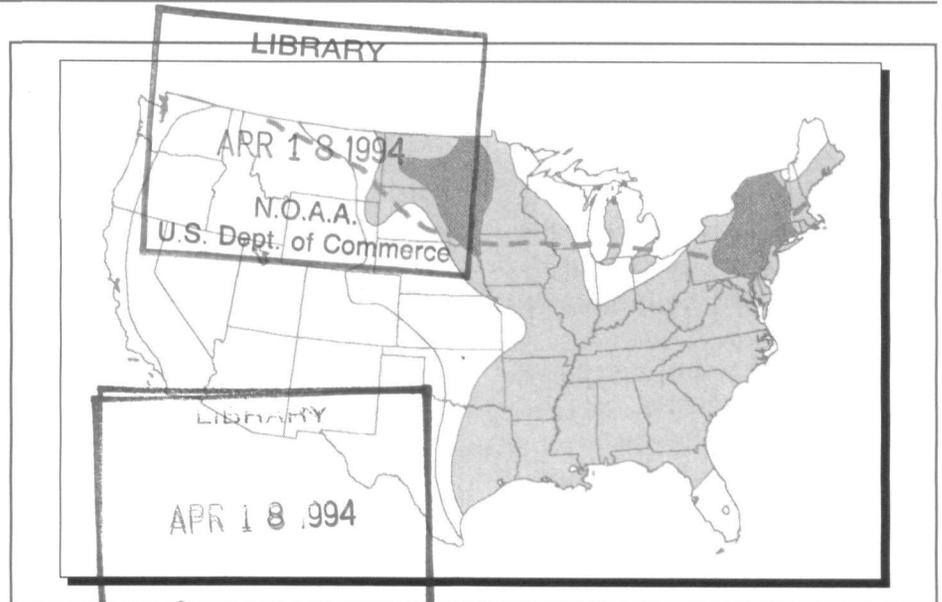
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research into the next century. The current fleet of 18 active ships was built in the mid-1960s.

Olympic Coast Sanctuary Manager Named: Todd Jacobs has been named manager of Washington state's Olympic Coast National Marine Sanctuary, which is expected to be officially designated by NOAA by early summer 1994. Jacobs previously served as research and education coordinator at the Channel Islands National Marine Sanctuary off the coast of California. Jacobs is also certified as a NOAA advanced working diver, and oversees NOAA divers in the Pacific region of the National Marine Sanctuary Program.

The Olympic Coast National Marine Sanctuary, the first sanctuary in the Pacific Northwest, will stretch 135 miles from Cape Flattery halfway down Washington's undeveloped, rugged coastline, encompassing 3,310 square miles. The Nation's 14th national marine sanctuary will be officially

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In the National Weather Service's spring outlook, the flood potential for the black areas is above average, and the gray area is below average. Residents in the blue areas, however, have the "greatest concern" for flooding this spring.

Threat Lessens for the Midwest, But...

Is It the Northeast's Turn For Flooding This Spring?

Portions of the Northeast and the upper Midwest may experience heavy flooding this year, warned NWS hydrologists in the NOAA's 1994 spring U.S. outlook earlier this month.

The area hit hardest by catastrophic flooding last summer—the central Midwest—is at less risk, however, because flood potential in that area is no longer considered extreme.

The cold, snowy winter that brought deep snow cover and ice-choked rivers to the Northeast set the stage for possible significant flooding this spring in much of Pennsylvania, New York, western New Jersey and western New England, according to NWS data. In addition, snowmelt flooding seems likely in portions of eastern

North and South Dakota and western Minnesota.

'A Prescription for Serious Flooding'

"Rapidly melting snow, combined with heavy precipitation, is a prescription for serious flooding," said Frank Richards, chief of the NWS special studies branch. "The best way to avoid it is to have a gradual melt without any heavy rain."

In addition to snowmelt flooding, ice jam flooding on northern rivers covered with as much as three feet of ice could

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Next Generation Radar Debuts in Norman

The dream of a decade came to fruition in late February when NOAA's National Weather Service formally commissioned the first operational Next Generation Doppler Radar system (NEXRAD) at Norman, Okla. A formal commissioning ceremony was attended by numerous local, state, and NOAA officials to mark the first commissioning of the work horse of the NWS modernization program.

Dennis McCarthy, Meteorologist in Charge of the Norman Forecast Office hosted the ceremony. Deputy Under Secretary for Oceans and Atmosphere Diana Josephson and Dr. Elbert W. (Joe) Friday, Jr., NWS Assistant Administrator, spoke at the ceremony. More than 120 people attended.

Friday noted that the commissioning of the Norman radar system, a WSR-88D radar, is a major milestone in weather service's modernization and restructuring.

"This step officially establishes the WSR-88D as the primary radar system for the National Weather Service," Friday said. "Commissioning means that we have gone through all of the processes necessary to ensure that we can use this radar as our standard observing tool for this office. We are confident that the system does what it is supposed to do. All of the Forecast Office staff are trained, and the supplies and logistics are in place."

Pioneering Work

The NEXRAD program was initiated in the mid-1980s with NOAA involved in a joint effort with the Departments of Defense and Transportation to install the new Doppler radars in a nationwide network. Norman is the site



Dennis McCarthy, Meteorologist in Charge for the Norman (Ok.) Weather Service Forecast Office, signs the commissioning certificate for the new NEXRAD system, as Weather Service chief Dr. Friday looks on.

of much of NOAA's pioneering work in the applications of Doppler radar technology to weather forecasting and severe storm and flash flood warnings.

"There are already many real-life examples of how the Doppler system is being used to fulfill the Weather Service mission of protecting property and saving lives," Josephson said. "WSR-88D units at Norman; Melbourne, Fl.; and Sterling, Va. have demonstrated a significant increase in warning accuracy, combined with an even more significant decrease in false alarms. The units have saved lives and generated significant economic benefits, even in snow forecasting." Josephson lauded the cooperative efforts of the NOAA staff, scientists and students at universities, local emergency managers, and severe weather spotters who have contributed to advances in the use of WSR-88D data in the severe weather warning, verification and dissemination arenas. These ad-

vances make the WSR-88D marketable worldwide, she added.

These radars will replace existing NWS radars that were designed with 1950s technology. The Norman radar was the first operational unit of a nationwide network that will eventually include approximately 162 radars. Approximately 55 radars are already in place around the Nation. New installations are being completed at a rate of four per month.

Part of Total NWS Redesign

The modernization is a top-to-bottom redesign of the NWS. Based on the implementation of new technology and a greater emphasis on training and education in the sciences of meteorology and hydrology, the program is designed to provide more timely and precise severe weather and flood warnings and forecasts for the Nation. Other components of the modernization include the Automated Surface Observing Systems (ASOS), which

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Talking With . . .

Diana H. Josephson Deputy Under Secretary

NOAA Deputy Under Secretary Diana Josephson is a former NOAA satellite manager and most recently director of Mission to Planet Earth Studies for the Martin Marietta Corporation. She held a number of high-ranking positions with NOAA from 1978 through 1982, including acting deputy assistant administrator for satellites. During that time, she managed NOAA's two weather satellite systems and implemented the operational Landsat D system. For her work, she received the Department of Commerce Gold Medal for exceptional service in 1981. A native of London, England, she received her B.A. and M.A. from Oxford University, and studied law at the George Washington University Law School, Washington, D.C.

MIDWEST FLOOD SURVEY

Q: You had a lead role in the Midwest flood disaster survey. What did you and the team find? How would you rate the performance of the National Weather Service (NWS), the equipment, and the overall system?

DIANA JOSEPHSON: Overall, we found that the NWS did an outstanding job with the tools they had available to them. The key officials in the various communities were very pleased with the service that they received from the National Weather Service staff.

But, as with any major event like this, there are areas where we can improve. The National Disaster Report identifies those areas and has recommendations for improvement. One area of difficulty was inadequate technological capabilities within the current forecast and warning system. Most of these problems will be addressed with the implementation of NWS Modernization and Associated

Restructuring (MAR). A significant recommendation in the Report is that the modernization effort must be maintained on schedule and accelerated wherever possible.

The new Doppler radars we had in place provided major benefits during the flood. We also need advanced capabilities from programs such as AWIPS (Advanced Weather Interactive Processing System) to integrate all the data. We have a new program, the Water Resources Forecasting System (WARFS), that will make a big difference in our ability to accurately forecast river floods and flash floods with a better lead time. This program integrates the precipitation, runoff, and river

basin hydrology to predict river flow and flood stages. We hope to receive funding for this project in the future.

Other problems identified during the disaster survey were inadequate computer processing and telecommunication capabilities and problems associated with timely and complete dissemination of appropriate products.

A difficulty we had in predicting the flood, particularly with the rapid rises through flood stages, was the time it took to run the computer model used to forecast river flow. We were continually playing "catch-up." We could only run the model based on rain that had actually fallen. For example, the hydrologic model could not be used to predict flood stages using predictions of future rainfall. In a number of cases, by the time the model was run, the information was totally out of date because

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more rain had fallen in the interim. Due to the model's limitations, the river stages were actually above the hydrologic model's forecast stages. The new technology will help us deal with ongoing heavy rain events.

Q: Is this problem specific to this situation or is it consistent across the whole Weather Service?

JOSEPHSON: The system we have for Midwest river forecasting is similar across the whole National Weather Service. In more normal times, it's less of a problem—you have localized flash floods but not overall massive rainfall (and flooding) going on for weeks at a time.

Q: What sort of things did you see? Was there a lot of destruction?

JOSEPHSON: We flew over the Mississippi River basin for a couple of hours during our eight days there. From the air you can clearly see the flood plain. Most of it was still flooded during the third week in August. You could see houses, freeways, and cloverleaf intersections all underwater.

SATELLITE FAILURES

Q: On to another topic—the satellites that have failed recently. With your background at Martin Marietta and also at NESDIS (National Environmental Satellite and Data Information Service), can you give me some idea of what is currently going on within NOAA to identify what happened and to prevent it from happening in the future?

JOSEPHSON: In the case of the NOAA-13 failure, NASA, NOAA's contractor for the design and building of NOAA polar

satellites, established a panel to review the cause of the failure. NOAA participated in this panel as a member. The panel's initial findings indicate that the source of

final release of their report is scheduled for later this year.

With respect to the Landsat 6 failure, tests and evaluation of the problem are continuing. NOAA has convened an interagency review panel and I am awaiting the final report from them, which will include recommendations as to how we can prevent this from occurring in the future. This report

Where does NOAA want to be in the year 2005? What are the impacts of new technologies, the changing world situation, and increased awareness of environmental problems? What are the opportunities for NOAA?

the NOAA-13 failure was a design problem that had not shown up on 12 previous flights.

To generally describe the problem, there was a very close clearance between two surfaces within the battery-charging circuitry—one of which was grounded and the other was operating at the voltage of the solar array. The most likely cause of the failure was a protruding screw which hinged the narrow gap and shorted out the solar cell array. Without charging current, the batteries discharged and the spacecraft was lost. The fix will be to provide double insulation of the battery charging circuits. A number of other software and ground operation improvements will also be made. However, I am waiting for the final report from NASA which will contain very specific recommendations to prevent this failure from occurring on future missions of this polar spacecraft series. The

is to be issued very soon.

Q: With your background, what sort of insights can you give about the launching of satellites and what it takes to get them up and the inherent problems, if there are any? Is this a common thing or is it to be expected—the price of admission to a space program?

JOSEPHSON: No. It's not to be expected. The processes of designing, building, and launching satel-



lites are inherently complex. However, in a production series, as is the case with our NOAA polar satellites, it is expected that whatever "bugs" were in the system would have been worked out by the thirteenth launch. It's unusual to have a failure that late in the program.

NOAA'S STRATEGIC PLAN

Q: What was the impetus for the strategic plan, and what sort of things have come out of the comment period? What are its implications for NOAA?

JOSEPHSON: The Strategic Plan, in fact the whole strategic planning exercise, grew out of our belief that policy should drive budget and that we needed an agreed-upon policy context within NOAA which could then be reflected in our budget requests. In March 1993 we started the strategic planning effort which led to the development of the FY '95 budget in June. The FY '95 process was our first opportunity to have an impact on NOAA's budget.

The planning effort involved between 300 and 400 people, many from the Washington area but some from other parts of NOAA throughout the country. We needed to be able to answer the

had a major impact on the internal corporate thinking of this agency. Through this plan, NOAA reached a consensus about what it wanted to do. The Strategic Plan has certainly helped our budget presentation because there is now a policy rationale for additional funding requests. We have redone our entire budget structure in accordance with the Strategic Plan and it has been accepted by the Department and by OMB and is now being presented to the Congress.

We've gone further with the process. The Strategic Plan would be just a nice document that sits on a shelf somewhere if we did not take it to the next step. We have asked the teams involved in developing the Strategic Plan to come up with plans to implement it in FY '94 within our existing base budget. These implementation plans are the basis for the operating plans of the line organizations and the program offices as well as the performance plans for our SES executives. We want all the

Environmental Stewardship, and Environmental Prediction and Assessment. These missions will be the impetus for NOAA for the next decade. Within these missions, we have identified seven program elements, four in the area of Environmental Stewardship and three in Environmental Prediction and



Assessment.

Let's look first at where we want to be in the living marine resources arena. Within our Environmental Stewardship mission we focus on two major areas of responsibility: building sustainable fisheries and protecting endangered species.

We are working to establish a sustainable development environment for fisheries. This concept of sustainable development represents a new attitude about economic development, government regulation, and the environment. The central goal is to provide for economic development and sustained use of natural resources. At the same time, we must preserve

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Our goal is to integrate the various responsibilities of NOAA to establish an ecosystem approach to the way we look at coastal issues...

questions: Where does NOAA want to be in the year 2005? What are the impacts of new technologies, the changing world situation, and increased awareness of environmental problems on NOAA? What are the opportunities for NOAA?

I think that the Strategic Plan and the work that went into it has

key planning, budget and implementation documents for the agency to be consistent.

Q: Where do you see NOAA being in 10 years, through the Strategic Plan and such? And how do you propose to get there?

JOSEPHSON: We see NOAA as having two major missions: Envi-

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Diana Josephson

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the long-run productivity of natural systems and minimize the deterioration of environmental quality. Development is an issue of people and "sustainable communities" and not just natural resource protection.

The second area we must focus on is endangered species and the rate at which more species are becoming endangered. Obviously, this issue has a great impact on the life of every American and it has an increasing economic impact. Our goal must be proactive. We must prevent additional species from becoming endangered, and for those that are already endangered we must complete the development of protection plans, implement these plans, and hopefully get species off the endangered list.

The third area in Environmental Stewardship is promoting healthy coastal ecosystems. In this program element, our goal is to integrate the various responsibilities of NOAA on coastal issues and to establish an ecosystem approach to the way we look at these issues. We recognize that, in addition to ourselves, many other agencies have authorities in the coastal areas and this effort is going to require considerable interagency coordination.

A major focus is restoring habitat which will have a major impact on the viability and sustainability of our fisheries.

The fourth and final area of the Environmental Stewardship mission is the modernization of navigation and positioning services. There are many new technologies available to us which are going to

revolutionize this whole area. Our goal, by 2005, is to have made the investment that's going to enable the Nation to reap the advantages of these new technologies. We currently are transitioning from producing paper nautical and aeronautical charts to digital information displays. The hydrographic and aeronautical data that we collect will form part of a multiplicity of data sets which will be used in marine geographic information systems (GIS).

Environmental

Assessment and Prediction is the other NOAA mission. There are three areas of emphasis under the Environmental Assessment and Prediction portfolio. The first is to improve short-term warnings and forecasts, the second is to implement seasonal to interannual climate forecasts, and the third is to predict and assess decadal to centennial environmental change, including climate change.

Currently, we are in the midst of a major modernization of the National Weather Service. Our goal is to ensure that the evolving modernization of the advanced short-term warning and forecast aspects continue so that we don't have to go through such a similar major upgrade in the future.

We believe that the research investment NOAA has made to date has put us in the position of being able to do experimental forecasts of El Niño and other seasonal to interannual events, and

to begin to take the steps necessary to make these forecasts operational. This is a major transition, which we hope to have completed by the year 2005.

In the case of predicting and



assessing decadal to centennial change, we are still in a very heavy R&D phase. One of our goals is to issue long-term climate forecasts at some point in the future, maybe 10, 15, 20 or so years from now. We are starting to look at the pre-operational building blocks we need to put in place now to help us make that transition when the time comes.

If we look at these areas, what NOAA is really looking at, for 2005 and beyond, is predicting atmospheric events on all time scales along with the oceanic input into those events.

Q: That's a very specific plan. How do we plan to get there?

JOSEPHSON: After developing the Strategic Plan, we developed our budget request for FY 95 based on each of the seven major program elements. In a sense, we view ourselves as going down seven

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River Forecast System Offers Aid to Water Managers in Egypt

New technology, currently on display in Egypt's Nile River, can forecast the flow of rivers more accurately will be a boon to drought- and flood-prone countries that need to better manage their water resources, NOAA researchers have announced.

The technology has already had measurable success, with the accurate prediction of the Nile's flow, NOAA scientists said.

The first three-month forecast of the Nile River flow issued in July 1993 was near perfect, said Curtis Barrett, manager of international technology transfer for the NWS Office of Hydrology.

"The Nile Project is proving

that we can offer countries the opportunity to better manage their water resources by forecasting river flow months in advance," said Barrett. "This new technology could help many countries facing frequent shortages of water to support their populations."

A Growing World Problem

Water scarcity is growing rapidly with a growing world

population, urbanization and economic growth. According to the World Bank, 26 countries in Asia and Africa, with 232 million people, are categorized as "water scarce." Many more suffer periodic droughts.

The water resources forecasting system at work on the Nile combines weather data gathered by a European Space Agency satellite, with records of past rainfall and flooding, into complex formulas that calculate long-range prospects for levels of river flow.

Too Many Boats, Subsidies: Global Fishing Study

The first comprehensive analysis of the world's distant-water fishing fleets found over-capitalization and some subsidies in the industry have resulted in huge catches—challenging both fishermen and fishery administrators around the globe to maintain what was once thought to be a virtually limitless resource, NOAA announced today.

The six-volume study, *World Fishing Fleets*, examines past, present and future aspects of distant-water fishing fleets made up of nearly 24,000 vessels from 65 countries that harvest in waters other than their own. The study includes catch statistics, details on fishing areas, vessel construction and imports, reflagging (registering a vessel in another country), international agreements and joint fishing ventures.

The International Affairs Office staff in NOAA's National Marine Fisheries Service spent more than a year compiling data from widely disparate sources to create the detailed report.

Raise High the Roof Beam, Carpenter: Northeast May See Floods This Spring

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occur. If the rivers rise rapidly before the ice softens, the ice may break up and jam at river constrictions. This can create a dam, with water backing up behind it, and lead to rapid upstream flooding. If the jam suddenly breaks, water can surge downstream, sometimes carrying large chunks of ice that can add to flood damage.

This winter's weather has also left much of the United States east of the Rockies wet and more vulnerable to flooding than usual. "The potential for flooding is above average in many areas. However, future weather—particularly rainfall and, in areas with snow cover, melt rate—will determine whether flooding will occur," Richards said.

Good News for Midwest

The best news is in the Midwest. After record flooding devastated a nine-state area last summer, there was great anxiety

about flooding this spring.

Though there is still an above-average flood potential in much of this area, it is no longer considered extreme, with the exception of the eastern Dakotas and western Minnesota.

"Unless excessive precipitation amounts like last year's are repeated, widespread disastrous flooding is unlikely in the Midwest," said Richards.

The Western region's winter has been unimpressive this season, the weather service reported. Snowfall, so critical to the West's water supply, has once again fallen short of normal so far. Although precipitation in the winter of 1992-93 went a long way toward easing a long-standing drought in the West, another dry year would cause concern about long-term water supplies.

"There's an awful lot to make up, and only six to eight weeks left in the snow season," Richards concluded.

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designated after state and Congressional review of the proposal.

Scallop Fishermen Have Until May 1 to Upgrade Dredges: Scallop fishermen in New England will have until May 1 to install larger rings on their dredges. The 3½-inch diameter rings, which were supposed to have been installed for conservation purposes when a scallop management plan went into effect March 1, are not available in sufficient quantities to supply the industry. They were to replace the three-inch rings that are now being used in scallop dredges.

Although scallopers who have the larger rings in their dredges can continue to use them, those who don't must rely on a standard that calls for an average of no more than 33 scallop meats per pound. The meats-per-pound system, which had been

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in use for several years before the new plan went into effect, has been criticized by scallopers as being cumbersome and difficult to enforce.

Weather Service Director Named Federal Executive of the Year: Elbert W. Friday Jr., NOAA's assistant administrator for weather services, has been named Federal Executive of the Year by the Federal Executive Institute Alumni Association.

Commerce Secretary Ronald H. Brown commended Friday, saying "Dr. Friday's leadership has been an invaluable asset in our continuous efforts to make NOAA's National Weather Service a crucial and life-saving tool for all Americans. I commend and thank him for his efforts."

Friday was recognized for his successes in managing and directing the NWS during a time of rapid modernization. A native of DeQueen, Ark., Friday retired from the U.S. Air Force as a colonel after 20 years of service. He earned his bachelor's, master's and doctoral degrees from the University of Oklahoma.

First NEXRAD Debuts in Norman

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will be installed at airports around the country, and a new Advanced Weather Interactive Processing System (AWIPS) computer system that will be installed at each new NWS facility.

The Norman radar was first tested during an operational assessment in the Spring of 1991. The staff at the Norman Forecast Office has used it successfully for nearly three years. It has been used since 1992 in conjunction with the WSR-

88D operated by the U. S. Air Force at Frederick AFB, Okla. Beginning this year, Norman forecasters will have access to data from another WSR-88D operated by the Air Force at Vance Air Force Base to help them develop forecasts and issue severe weather warnings for most of central and western Oklahoma and part of northern Texas. The older radar located at Will Rogers World Airport in Oklahoma City will be decommissioned later this year.

—Chris Smith

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roads. The pace at which we travel towards our goal of 2005 will depend on many factors, such as the funding we get, the success of our research, etc. We may need to adjust the direction from time to time, taking into account events in the external environment, but we are now going in a specific direction.

SURPRISES

Q: Is there anything that you found here that surprised you, that you didn't expect, even though you've been part of NOAA before?

JOSEPHSON: I knew that NOAA had a very difficult time for the last

12 years. One of the real benefits of the strategic planning process was establishing a more positive, forward-looking, supportive, and creative look at our programs. NOAA leadership is trying to support a NOAA that is proactive, substantive, and honest. I think that message has gotten across and my observation is that many view their environment more positively than they did a year ago. It is certainly one of our major goals to achieve this result.

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