

NOAA REPORT



FEB 1 1996

Vol. V, No. 1

January 1996

N.O.A.A.
U.S. DEPT. OF COMMERCE

Right on the Mark: The northern U.S. should see a White Christmas, according to a National Climatic Data Center report issued on December 21—more than two weeks ahead of the Blizzard of 1996 which closed the Federal government and much of the Northeast and Mid-Atlantic for a week.

Calling a White Christmas a snow depth of at least one inch, the chances were 60 percent or better over an area in

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cluding much of the northern Rockies, the northern Great Plains, the Great Lakes area, and most of New England. The chances were less than 20 percent over most of the southern third of the country excluding the Rockies, along with the Pacific coast. Higher mountain areas (for example, elevation of 8000 feet in an area averaging about 4000 feet) tended to have higher probabilities for a white Christmas.

Now if they could just tell us here in Washington when it's all going away...

Note to Readers

This issue of NOAA Report was delayed due to the partial government shutdown and Northeastern blizzard. Stories chronicling the performance of NOAA during the blizzard are scheduled to appear in the February issue.



NOAA's participation in Earth Day was a major part of its 25th anniversary year. Here, children visit the NOAA Science Center as part of an open house in the Silver Spring Metro Center.

1995 in Review

A Look Back at a Busy Year

As NOAA celebrated its 25th anniversary of science and service to the Nation in 1995, it saw many accomplishments and challenges. NOAA remained committed, as it has been since it was established in 1970, to its mission of observing, predicting and protecting our environment.

The past year was a very busy one for NOAA and all its line offices. Here is a brief look at some of the highlights:

National Weather Service

The 1995 Atlantic hurricane season went into the books as the second most active season in 125 years. Out of 19 tropical storms that churned in the Atlantic, 11 became hurricanes—five of them classified as category 3 hurricanes or above. Now last year's hurricane season stands

behind 1933's record season of 21 storms.

The winter of '95 was dominated by El Niño conditions which greatly affected weather and climate patterns across the United States. And, a searing heat wave gripped many parts of the nation leaving 500 dead in its wake. A record dry spell was recorded in the Northeast and Mid-Atlantic regions.

By the end of 1995, NWS completed nearly two thirds of its planned modernization and restructuring of observing and forecasting systems; commissioned 84 Doppler radars and 140 Automated Surface Observing Systems; launched the second in a series of new Geostationary Operational Environmental Satellites; and,

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opened the new National Hurricane Center in Miami.

National Marine Fisheries Service

NMFS concluded the year by completing 26 of its 30 objectives aimed at building sustainable fisheries, part of its Strategic Plan which envisions an integrated marine

environment that sustains commercial and recreational activities; preserves our mammals, turtles and fish; and, nurtures individual ecosystems.

During 1995, NMFS moved to conserve species by proposing, developing and implementing recovery and conservation plans for depleted marine mammals, and

endangered and threatened species, and by implementing conservation measures based on recovery plan priorities.

A major milestone was the development of the National Habitat Action Plan establishing future directions of the national program to conserve, restore, understand, and manage
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Md. High School Part of Program

NWS Mentor Helps in Blair Student's Project

Daniel Hess, a senior this year at Montgomery Blair High School in Silver Spring, Md., is working to finish his senior research project leading to graduation next spring. Dan has been working with scientists in the National Weather Service's Techniques Development Laboratory (TDL) since last June. After an initial meeting, Dr. Jerome Charba of TDL agreed to be Dan's mentor.

Dan's project involved testing the performance of experimental statistically based models that forecast the amount of precipitation 20 hours in advance at approximately 4,000 locations throughout the United States. The project required the use of a large data set of historic meteorological data and extensive computations on NOAA's mainframe computers. The project was completed and helped extend his mentor's ongoing research.

Throughout last summer Dan worked 30 to 40 hours each week in TDL's Silver Spring offices as an unpaid volunteer trainee. He interacted with Dr. Charba and other laboratory scientists daily, and frequently participated in group seminars and other laboratory functions.



Dan Hess, Montgomery Blair High School senior, describes his project to other students at a recent visit to NOAA's Silver Spring Metro Center campus.

Dan is currently preparing his project report which he expects to complete next spring. He consults with Dr. Charba on a weekly basis and occasionally visits to pick up or

return reference material. Dan is in the process of making a decision on college and, based on his experiences with NOAA, is considering studying atmospheric sciences.

Focus On...

NOAA Award Winners

NOAA and the Department of Commerce honored the following people late last year for their contributions to the Nation:

GOLD AWARDS

Bruce H. Needham, Robert S. Winokur, and David W. Yeager (NESDIS): For teamwork and leadership in establishing the National Polar-orbiting Operational Satellite System, aiding convergence of NOAA and Department of Defense satellite systems, and achieving cost savings of \$49 million in the first year.

Lawrence B. Dunn and Graham E. Stork (NWS Western Region): For directing the efforts to aid in the search and rescue of three skiers trapped by an avalanche and putting their lives at risk during the rescue.

Thomas N. Pyke Jr. (Office of High Performance Computing and Communication): For the rapid startup leadership of the GLOBE Program, a Vice Presidential international environmental science and educational initiative. The Global Learning and Observations to Benefit the Environment program currently involves 1,900 U.S. schools and 21 other countries, and is expected to reach millions of students in more than 100,000 schools in more than 60 countries in the future.

Fred C. Fehsenfeld (Aeronomy Laboratory, OAR): For pioneering research into the chemistry of the troposphere on the vital topic of regional air quality, leading the way to a new understanding of the factors

that control ozone levels in the lower atmosphere.

Walter H.F. Smith (Geosciences Laboratory, NOS): For scientific breakthroughs in the application of satellite altimeter and ship data to the estimation of seafloor topography in the southern oceans, aiding earth science research around the world.

National Severe Storms Laboratory (NWS): For providing outstanding leadership leading to, and the continuous improvement of, a national Doppler radar system, significantly advancing our Nation's weather service.

Stephen Paul Freese (Northwest Region, NMFS), **Paul M. Matyskiela** (Philadelphia Regional Office, Economic Development Administration), **Bruce C. Moorehead** (Office of Industry Services, NMFS), and **Lance R. Simmens** (Office of Sustainable Development and Intergovernmental Affairs): For exemplary interagency cooperation in devising innovative aid programs for the Nation's fisheries, based on the concept of sustainable development.

SILVER AWARDS

Craig S. Long, **A. James Miller** (National Meteorological Center, NWS), **Mary C. Newton** and **Richard C. Przywarty** (Office of Meteorology, NWS): For the design, development and implementation of the nationwide Ultraviolet Index, which raised public awareness of the possible harmful effects of ultraviolet radiation.

Christopher J. Cuoco (Western Region, NWS): For fire weather forecast support to fire management agencies during the disastrous fire weather season of 1994, serving as the sole source of weather information for firefighters during life-threatening situations for 44 days.

Jerry Galt (Office of Ocean Resources Conservation and Assessment, NOS): For saving a stranger's life aboard an airplane flight to Alaska; the passenger experienced both shock and respiratory failure.

Crew of the NOAA Ship *Ferrell*: For vigilance and competence in the emergency rescue of a sailboat off the Virginia Capes during a gale, saving three sailors.

Thomas M. Wrublewski (Polar Acquisition, Systems Acquisition Office): For leadership in the coordination and technical management of NOAA and NASA activities resulting in the successful launch of the NOAA-12, NOAA-13 and NOAA-14 satellites.

James K. Angell (Air Resources Laboratory, OAR): For research on long-term changes in ozone and temperature in the upper atmosphere.

Ramon J. Conser Jr. (NW Fisheries Science Center, NMFS): For pioneering research on risk-based fishery decisions making methods and improved analyses for species whose age cannot be determined.

Ray E. Habermann and Allen M. Hittelman (National Geophysical Data Center, NESDIS): For leading the Federal government in improved access to environmental data in a

format-independent software package.

William T. Turnbull (Environmental Informational Service, NESDIS): For service to the Nation through on-line access to data, integration and modernization of NOAA data services and the National Environmental Data Index.

Chandrakant M. Bhumralkar (National Sea Grant College Program, OAR): For exceptional leadership of atmospheric and oceanic research uniting Federal, state and academic partners to achieve crucial national goals.

Timothy P. Boyer, Jeffrey P. Burney, Jennifer E. Campbell, Margarita Conkright-Gregg, Daphne R. Johnson, Sydney Levitus, Linda Stathoplos (National Oceanographic Data Center, NESDIS): For leadership in the acquisition, analysis and publication of the World Ocean Atlas 1994, a landmark event in oceanography, making climate studies of interannual to decadal scale ocean variability possible.

BRONZE AWARDS

OFFICE OF NOAA CORPS OPERATIONS

Gerry Bloom, Joe Colvin, Than Loi (Electronic Engineering Division, Atlantic Marine Center and the Port Captain, Northeast Marine Support Facility): For outstanding scientific electronics and support capability which allowed NMFS to meet its data collection requirements in the absence of the *Delaware II*.

Richard Whitehead, Jr.: For eight years of exemplary, dedicated service as Chief Steward aboard NOAA ship *Heck*.

OFFICE OF ADMINISTRATION

John C. Kyler, Eugene C. McDowell: For the creation of the NOAA Headquarters Network Operations Center.

John T. Sedovic: For recognition of his vision, leadership and commitment to excellence in supporting the National Weather Service Facility Modernization Program.

OFFICE OF COMPTROLLER

Joseph F. Giza: For long-standing contributions to improving financial management, implementing financial policy, and service to the Department of Commerce, NOAA and its predecessor organizations.

SYSTEMS ACQUISITION OFFICE

Susan L. Callis, Julie Scanlon, John A. Milholland, Philip G. Cragg, David R. Smiley (Electromagnetic Interference Resolution Team): For resolution of electromagnetic interference problems with NEXRAD Systems.

David B. Caldwell, Nancy L. Buck, James L. Higgins, Joseph A. Jankoviak,

Charles E. Kinsey, Peter C. Lyden, Gary E. Rice, Miguel A. Rosario-Felix (NEXRAD Spare Parts Plan and \$39M Savings Team): For development and implementation of the NEXRAD Spare Parts Procurement Plan.

NATIONAL OCEAN SERVICE

Gary S. Farr, Martin J. Yellin: For technical development contributions to the Digital Raster Chart Program.

Douglas B. Graham: For implementing a Digital Delivery System for aeronautical data.

Dennis J. Hill: For outstanding achievements in the continuing development of digital hydrographic data processing.

David Poltilove, Mark W. Munsell, Gene E. Page: For development of the Super Computer-Assisted Revision System.

Aeronautical Charting Division: For achievement of critical program goals

in the development, production, and distribution of the Nation's Aeronautical Charts.

ELPIS/Maitland Coral Reef Restoration Project Team: For successful settlement, design, implementation, and completion of coral reef restoration projects in the Florida Keys.

Thomas F. Lapointe, Eliot Hurwitz, Marcia Orenca, Michael J. Shelby, John Paul Tolson (NOS Multimedia Project Team): For production of an NOS Multimedia CD-ROM, *Turning The Tide: America's Coasts at a Crossroads* for use in public education facilities.

NATIONAL WEATHER SERVICE

Huug M. van-den-Dool, Ming Ji, Arun Kumar, Ants Leetma, Edward O'Lenic, Anthony G. Barnston, Jeanne L. Hoadley, James P. Travers: For leadership in developing and implementing an ocean-atmosphere climate prediction system and operational U.S. forecasts out to one year in advance.

Betty A. Borger: For the transition of the Eastern Region Cooperative Program in conjunction with the modernization and restructuring of the National Weather Service

Lloyd G. Dean: For permitting a possible partnership to exist between the meteorological community and communication services companies to share limited frequency spectrum.

Mary des Jardins: For the development of GEMPAK (Generalized Meteorological Software Package) and its wide distribution to the research and operational meteorological community.

Robert C. Embleton, Howard Diamond, Kelly Greene, Lewis Kozlosky, Dirk Staubs: For development and implementation of a "Rapid" Change Management System for NWS data products.

Mark J. Fenbers: For the development of software to transfer precipitation and temperature forecaster between WFOS (Weather Forecast Offices), RFCS (River Forecasts Centers) and the NWS National Centers.

Jerry A. Stephens, Walid Bannoura, Norman Courchesne, Gregory Dalyai, Kevin E. Kay, Joel Nathan, Roger Shriver, Janet Soslow,

Avia Spruill, Terry L. Praisner (AFOS S/230 Computer Placement Project Team [Automation of Field Operations and Services]): For acquisition and deployment of an innovative replacement computer for the primary NWS Field Data Processing and Communication System.

Darryl L. Modracek: For maintaining NOAA's Weather Radio network through national maintenance transition without missing a single storm warning.

Danial V. Wilson: For superior leadership and support in the development and start-up of multiple national and regional electronics maintenance programs benefiting the National Weather Service.

NATIONAL MARINE FISHERIES SERVICE

Allen J. Bejda: For serving as lead NMFS representative in the design, construction and equipping of Howard Marine Sciences Laboratory's sophisticated new experimental facility.

Patricia H. Bradley: For maintaining and improving protected species permit database management systems and preparing reports for program management and the public.

Charles Caillouet Jr., Andrea Cannon, Marcel J. Duronslet, Clark T. Fontaine, Sharon A. Manzella-Tirpak, Dickie B. Revera, Erick K. Stabenau, Jo Anne Williams,

Theodore D. Williams: For developing techniques in sea turtle husbandry, head-starting, tagging, submergence physiology & support of the Sea-Turtle Stranding & Salvage Network.

William W. Fox Jr., Dean M. Wilkinson, Michael F. Tillman: For negotiating an end to the practice of using marine mammals as crab bait in Chile and averting an embargo of crab products while free trade talks were conducted.

Kevin D. Friedland: For scientific research, planning and organization in support of management efforts to reduce high sea catches of USA origin Atlantic salmon.

Susan M. Gold: For continued outstanding accomplishments in the redesign and implementation of complex computer systems.

Raymond M. Glass, Gerry W. Gray, James W. Sargent, Richard L. Schween, Mark C. Holiday: For development and implementation of the National Marine Fisheries Service's Management and Information System.

Robert R. Kifer: For leadership and vision in habitat conservation, fisheries management, and seafood safety to resolve issues vital to NOAA/NMFS, the fisheries industry and U.S. consumers.

James H. Lecky, Gary R. Stern: For leadership and innovation in finding ways to protect endangered salmon while imposing minimum necessary economic impacts on California water users.

Margaret F. Hayes, Pamela M. Mace Dean Swanson, Will E. Martin (Office of International Affairs), **Samuel G. Pooley, Andrew A. Rosenburg, Robin L. Tuttle:** For support to the U.S. Delegation to the United Nations Conference on conservation and management of

straddling land highly migratory fish stocks.

Frederic H. Beaudry, John F. Mitchell, Charles A. Oravetz, James E. Barbour, Kendall M. Falana, Jack Forrester, Eric G. Hawk, Wilbur A. Seidel, Robert D. Stevens: For contribution in sea turtle recovery and conservation through the international use of Turtle Excluder Devices (TEDs).

Timothy R. Osborn, Rimas Liogys, Teresa A. McTigue, Erik C. Zobrist, Beverly J. Eggeman, Richard Hartman, Jan Koellen, Thomas J. Minella, Rickey N. Ruebsamen, Gordon Thayer: For implementing protection and restoration activities of benefit to over 25,000 acres of fishery habitat in coastal Louisiana under the CWPPRA (Coastal Wetland Planning, Protection and Restoration Act of 1990) program.

Allen E. Peterson, Jr.: For directing management and research efforts successfully by reducing the high-sea harvest of U.S. origin Atlantic salmon stocks.

Kenneth Sherman: For his creativity, leadership and persistence in developing and implementing world-wide ecosystem based monitoring and assessment programs.

Sherry L. Smrstik: For extraordinary services to NOAA and the marine mammal community in development of the National Marine Mammal Laboratory Library.

Restricted Access Management Division: For implementation of the Pacific Halibut and Sablefish Individual fishing Quota (IFQ) Program.

State, Federal, and Constituent Program Division: For executing emergency fishing industry grants of the Northeast Fisheries Assistance Program with urgency and extraordinary efficiency.

NATIONAL ENVIRONMENTAL SATELLITE DATA AND INFORMATION SERVICE

Norman C. Grody, Ralph R. Ferraro, David G. Forsyth: For development and production of the first global precipitation climatology from satellite microwave radiometer data.

John J. Jacobs, Harold M.

Craddock, Everitt W. Kendall: For superb team efforts in the design and installation of a state-of-the-art information technology LAN and for the move of computer systems into the new National Climatic Data Center facility.

Michael Mignogno: For contributions in furthering U.S. leadership in land remote-sensing through implementation of Department of Commerce's role and responsibilities.

C. R. Nagaraja Rao, Tsan Mo, Jerry T. Sullivan, Charles C. Walton: For improving the calibration of NOAA's satellite instruments leading to greater data accuracy.

Peter M. Steurer: For facilitating rapid identification of and access to National Climatic Data Center archives via innovative automated records management.

Benjamin Watkins: For innovative leadership resulting in the creation of the first NESDIS Diversity Council and diversity management position.

Richard Cram, Robert Boreman, Larry Griffin, John Kobar, Everitt Kendall (NCDC Next Generation Radar [NEXRAD] Team): For successful development of a dynamic program to process, archive and manage large amounts of data generated by NOAA WSR-88D Doppler Radar System.

Richard Borneman, Mark Ruminski (NESDIS Synoptic Analysis Branch): For adaptability to rapidly changing customer needs and quality results exceeding customer expectations during several flood events.

OFFICE OF OCEANIC AND ATMOSPHERIC RESEARCH

Bruce W. Bartram, Kurt A. Clark:

For designing, maintaining, and operating two advanced radar systems for the collection of data needed for oceanic and atmospheric research.

Lawrence P. Griffin, Dennis E.

Nealson: For fabrication of a mobile Doppler weather radar, The Doppler-on-wheels, for close-in probing of severe supercell thunderstorms and tornadoes.

Gary R. Heckman: For outstanding industry, expertise, and vision in innovatively evolving the delivery and products of NOAA's space environment services.

James McVey: For developing NOAA's aquaculture program into the premier program in the United States and for his international leadership in aquaculture science and technology.

James F. Olander: For outstanding efforts in improving grants management processes and financial management practices in the Office of Oceanic and Atmospheric Research.

ADMINISTRATOR'S AWARDS

OFFICE OF INTERNATIONAL AFFAIRS

Thomas L. Laughlin, III: For creative leadership in NOAA, nationally and internationally in addressing issues of marine pollution and marine ecosystem management.

OFFICE OF OCEANIC AND ATMOSPHERIC RESEARCH

Brian J. Eadie: For significant scientific research achievements and contributions in NOAA's aquatic research programs in the Great Lakes and Coastal Oceans.

Rene E. Eppi: For his creative use of foreign policy tools in furthering NOAA's scientific mission.

James R. Holbrook: For leadership and guidance in developing and demonstrating the utility information management technologies to improve both internal and external access to NOAA's Environmental data and value-added products.

Lester Machta: For leadership in the studies of radioactive fallout, trace gas measurements, acid rain and atmospheric transport and dispersions that have fostered pioneering advances in our understanding of the global atmosphere.

Ronald Zwicky: For his leadership in arranging for real-time solar wind data to be broadcast from NASA's Advanced Composition Explorer (ACE) spacecraft.

Winston T. Luke, David L. Auble, Robert J. Backlund, James M. Barr, Timothy L. Crawford, Laureen Gunter, Ray T. Huddleston, Robert T. McMillen, Bradley T. Patten, Thomas B. Watson, Dennis L. Wellman, Stan W. Wilkinson (Twin Otter Instrumentation Team): For outstanding team efforts in the modification and successful operation of NOAA's Twin Otter aircraft in major ozone field studies in Nashville in June and July 1995.

OFFICE OF ADMINISTRATION

Donald E. Humphries: For outstanding leadership in the management of NOAA's Office of Administration during a critical period of downsizing, streamlining and budgetary reductions.

Darrell G. Wallace: For leadership in establishing the National Logistics Support Center as a model of customer service excellence and one which sets standards in the logistics management community.

SYSTEMS ACQUISITION OFFICE

Steven W. Thornton, Madan Kar, Cornelius Willis: For procurement excellence in enhancing performance of the NEXRAD acquisition program.

NATIONAL ENVIRONMENTAL SATELLITE, DATA AND INFORMATION SERVICE

Kenneth Davidson: For his contribution toward the NOAA effort in reinventing government, his support of international climate data activities through the World Meteorological Organization and in his oversight of the National Climatic Data Center move.

Anne O'Donnell: For developing NOAA's home page and the national environmental data index prototype, enabling Internet users to find environmental information from six federal agencies.

NATIONAL MARINE FISHERIES SERVICE

Robert V. Miller: For the development and administration of the Marine Mammal project of the US-Russia Environmental Protection Agreement.

Philip M. Payne: For contributions

to NOAA's environmental stewardship mission through efforts to develop and implement conservation programs for marine mammals.

Mary Jane McFarland, Regina Spallone, Peter Christopher, Beverly Freedman, Lucille Helvenston, Sharon Martin, Katherine McTeague, Mary Shanahan, Marianne Taylor, Deborah Welch, Esther Young (Fisheries Management Limited Access Permit Qualification Team): For contributions during implementation of a limited access program for the American lobster fishery.

NATIONAL OCEAN SERVICE

Mark S. Schenewerk: For contributions to geodesy and geophysics through the development of Global Positioning System data processing and analysis techniques for precise orbits and positioning.

NATIONAL WEATHER SERVICE

Gary Carter: For bringing up-to-date and relevant science and technology into daily weather forecasting via a wide array of training and professional development efforts.

Nancy W. Huang: For sustained vision, leadership and innovation in the NOAA Asian/Pacific American community, and for notable involvement and significant contributions to the diversity objectives of NOAA and the National Weather Service.

William R. Sammler: For building a partnership with the emergency management community.

Daniel S. Starosta: For his major accomplishments in information systems in support of the National Weather Service modernization.

Bradley R. Colman, William (Josh) Korotky, Ronald W. Przybylinski, Steven M. Zubrick, Kraig B. Gilkey, James L. Partain Jr. (NWS Science & Operations Officers' Program): For providing motivation and significant contributions to the benefit of NWS operations, the research community and academia.

Robert Saffle, Paul Greaves, Jeffrey L. Payne, Therese Pierce, Curtis Stanford (Secretary's Report Team): For developing and delivering credible documents under extreme political and administrative pressures and schedules.

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improvements to our coastal habitats. In addition, NMFS completed its Florida Keys Marine Sanctuary coral reef restructuring project and implemented construction and restructuring plans for a number of other important coastal habitat sites.

Last year NMFS underwent a major transformation as its management and organization were streamlined in order to improve its efficiency. It is now a more compact and better trained operation.

NESDIS

The United States moved into a new era of weather forecasting as the second state-of-the-art environmental satellite was launched. The fully operational satellite now makes the United States the most technically advanced weather forecasting country in the world.

A major agreement was signed mid year by NOAA, NASA and the Department of Defense to combine the Nation's military and civilian weather satellite programs into a single system. This is estimated to save taxpayers as much as \$300 million through 1999 and additional

savings through the program's duration. The pact will allow inter-agency cooperation while at the same time allowing each agency to carry out its important mission requirements.

And, the United States and Japan kicked off an unprecedented exchange of environmental data under the Global Observation Information Network that enables researchers and policy makers from both countries to access data from the other by computer. This data is critical to predicting and preparing for natural

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disasters such as the Kobe, Japan, earthquake.

NOAA Corps

The NOAA ship *Malcolm Baldrige* set sail for an 11-month deployment to the Indian Ocean in support of six NOAA programs. Port calls included Durban, South Africa; Colombo, Sri Lanka; Muscat, Oman; and, Darwin, Australia. The ship is working its way back across the Pacific Ocean where it is servicing the Tropical Ocean-Atmosphere array of oceanographic moorings.

NOAA's P-3 "hurricane hunter" aircraft were kept aloft during the second most busiest Atlantic storm season flying into seven named storms, a total of 21 flights—the most ever undertaken in one year. Seven experiments to collect data were conducted including cyclone convection, subcloud layer inflow dynamics, and clouds and climate. In December, NOAA Corps pilots flew into Pacific Northwest coastal storms to study how mountain ranges affect weather systems.

The Teacher At Sea program received resounding enthusiasm as educators from across the country used summer leave to get hands-on scientific research and nautical charting experience on board ships operated and managed by the NOAA Corps.

Oceanic and Atmospheric Research

A wealth of information was gathered by a team of government and university scientists during the tornado season which concluded in June. The team got up close and personal with ten tornadoes in states in the central and southern plains. The Verification of the Origin of Rotation in Tornadoes Experiment (VORTEX) allowed scientists to document the entire life cycle of a tornado providing insight into the

behavior of the deadly storms.

A fleet of 18 to 20 chase cars and vans, loaded with sophisticated equipment, hunted down the storms while guided by NOAA's P-3 storm chaser aircraft. By gaining a crucial understanding of tornadoes it is hoped that in the future many lives can be saved.

NOAA scientists and colleagues from 43 research institutions from 11 countries embarked on one of the largest-ever experiments to study the link between atmospheric pollution and global climate change. The international team will measure gasses and airborne particles over the Pacific Ocean south of Australia. Samples will be collected over a month's time using a wide array of equipment, including the NOAA ship *Discoverer* and the Australian research vessel *Southern Surveyor*. In addition, atmospheric aircraft, four satellites, and balloons laden with instruments will be used during the experiment.

National Ocean Service

The first high precision map of the world's ocean floor received worldwide attention when it was released in the fall. The map, created by NOAA's scientists using declassified Navy data, reveals a wide array of details of the seabed, including additional seamounts and new details of the tectonic structure of the earth's crust. Scientists from around the world hailed the new image which promises to unearth new areas of investigation, such as new fishing areas and oil sites.

The FY '95 budget showed the first increase for NOAA's mapping and charting functions which reversed a decade-long decline. Many of the nautical charts are based on 50-year-old data that was collected by primitive technology. Charting and mapping is a very valuable service to the marine community given the increased traffic and size of commer-

cial ships that are negotiating new waters such as those in Alaska.

In addition, the NOS issued the first digital nautical charts on computer disc, culminating years of development in partnership with a group of private businesses.

Office of Sustainable Development

OSD organized and hosted a two-day national teleconference in September to discuss the future of coastal communities. Business, civic, and local government representatives from some 180 communities took part in the event. Vice President Al Gore and Commerce Secretary Ron Brown were among the many speakers.

In 1995, \$53 million of disaster assistance was made available for fishermen in Northeast, Northwest and Gulf states. Fisheries in the Northwest were hit hard by the effects of El Niño. Floods and sediment deposits in the Gulf plagued fishermen there. In the Northeast, overfishing and other man-influenced challenges wreaked havoc on the fishing industry. The \$53 million is being used to obtain long-term solutions to these fisheries disasters while helping to get fishermen back on their feet.

—Gregory Hernandez

NOAA Report is a monthly publication for NOAA employees from the Office of Public and Constituent Affairs, Washington.

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July 23, 2010