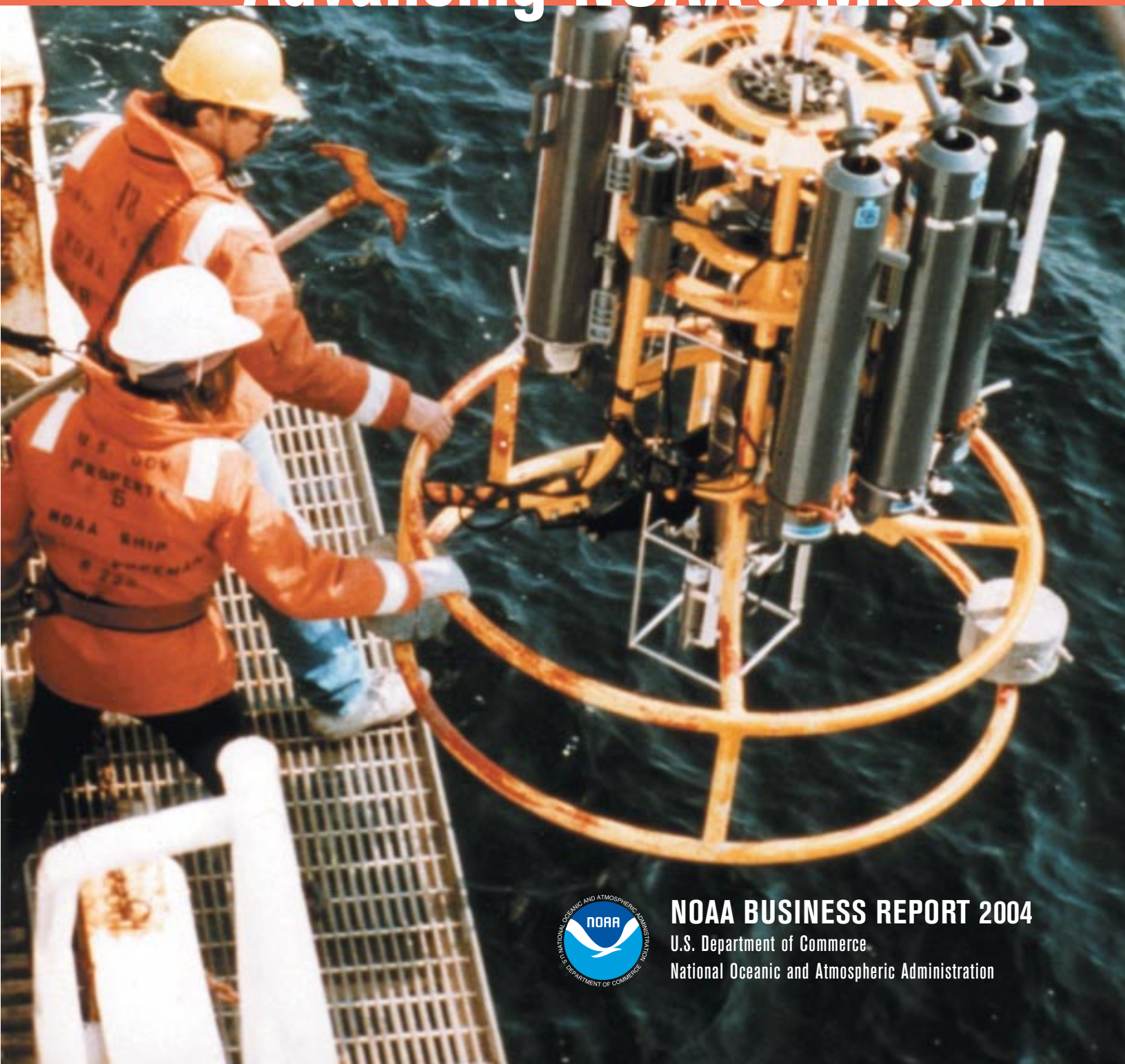
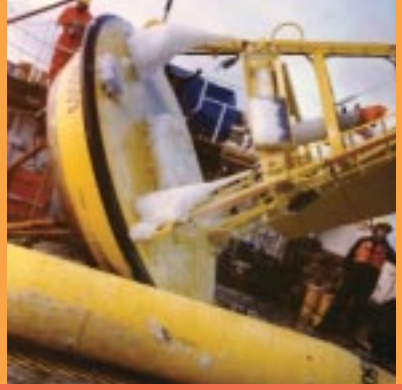
Advancing NOAA's Mission



NOAA BUSINESS REPORT 2004

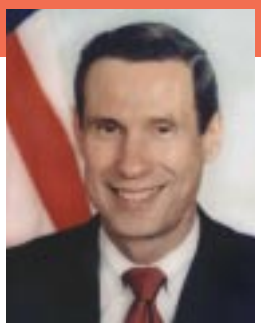
U.S. Department of Commerce
National Oceanic and Atmospheric Administration





Advancing NOAA's Mission

Building an Effective, Efficient, Unified NOAA



Conrad C. Lautenbacher, Jr.
Under Secretary of Commerce
for Oceans and Atmosphere

The National Oceanic and Atmospheric Administration (NOAA), a key component of the U.S. Department of Commerce, plays a vital role in the everyday lives of our citizens. From weather forecasts to fisheries management, from safe navigation to coastal services, from remote sensing to climate research and ocean exploration, NOAA is addressing many of this Nation's most critical issues. NOAA's 12,500 employees and $3.9 billion budget provide vital support to domestic security and global competitiveness and enhance the lives of our citizens, directly and indirectly, every day.

NOAA plays a pivotal role in the U.S. economy, providing products and services that affect 30 percent of the Nation's gross domestic product (GDP) every year. Waterborne cargo alone contributes over $740 billion to our GDP and supports jobs for more than 13 million citizens. The commercial fishing industry adds approximately $28.5 billion to the national economy on a yearly basis. NOAA's Web site at www.noaa.gov provides a wealth of knowledge to schools and young people across the Nation, as well as to industry and scientific enterprises.

MAJOR FY 2004 ACCOMPLISHMENTS

During FY 2004, NOAA continued its efforts to provide increasingly more accurate predictions of severe weather; enable a deeper understanding of long-term climate and environmental trends that can impact daily lives; sustain healthy marine habitats, robust ecosystems, and coastal environments; and address safety and environmental compliance issues affecting NOAA's number one resource—our people. NOAA achieved great program successes and strides to strengthen and promote economic growth, enhance national products, and improve management performance. NOAA's FY 2004 major accomplishments were:

NOAA'S VISION

An informed society that uses a comprehensive understanding of the role of the oceans, coasts, and atmosphere in the global ecosystem to make the best social and economic decisions.

NOAA'S MISSION

To understand and predict changes in the Earth's environment and conserve and manage coastal and marine resources to meet our Nation's economic, social, and environmental needs.

NOAA'S CORE VALUES

People, Integrity, Excellence, Teamwork, and Ingenuity
Science, Service, and Stewardship

- co-chairing the Group on Earth Observation meeting with representatives from South Africa, Japan, and the European Commission in Cape Town, South Africa, to finalize the draft Framework of the groundbreaking 10-year implementation strategy for a Global Earth Observation System of Systems (GEOSS);
- demonstrating substantial scientific leadership by continuing NOAA's unique contributions to advancing the understanding of global climate change through the rapidly expanding Global Earth Observation program;
- reopening the Hawaii longline and Northeast distant-water fisheries, and rebuilding programs for New England multispecies and West Coast groundfish fisheries, including a capacity reduction buyback;
- upgrading two NOAA ships;
- constructing the first of four planned fisheries survey vessels;
- managing approximately 50 construction projects valued at $590 million;
- developing and implementing a NOAA-wide safety policy;
- aiding over 252 life-saving rescues with the Search-and-Rescue Satellite-Aided Tracking (Cospas-Sarsat) system;
- issuing over 55,000 weather and water warnings and over 6,000 weather, water, and climate forecasts;
- producing 12 months of nearly flawless operation of 17 satellites and transitioning 14 experimental satellite products into operation;
- implementing a new global coupled atmospheric–ocean Climate Forecast System model; and
- issuing air quality forecasts for the northeastern United States.

DELIVERING FIRST-CLASS WORK

NOAA will continue to respond to key customers and stakeholders, and to leverage its programs and investments by developing associations that most effectively provide the means for successfully meeting NOAA's mission requirements. NOAA has achieved genuine progress from the NOAA Program Review and the subsequent introduction of new NOAA business practices. Drawing on NOAA employees' talent, dedication, and application of our new best practices, we can bring America and the world even stronger societal value from NOAA science. With the broad goal of advancing NOAA's mission by delivering first-class work that is reflected in outstanding performance measures, NOAA's new business processes are vital to keeping pace with difficult and rapidly accelerating 21st-century challenges. NOAA has the opportunity and mandate to pave the way for a remarkably improved quality of life for a growing world population.

NOAA's mission is to understand and predict changes in the Earth's environment and conserve and manage coastal and marine resources to meet our Nation's economic, social, and environmental needs.

Conrad C. Lautenbacher, Jr.
Vice Admiral, U.S. Navy (Ret.)
Under Secretary of Commerce for
Oceans and Atmosphere and
NOAA Administrator

NOAA HIGHLIGHTS

Management Improvements

Building an Effective, Efficient, Unified NOAA

Articulating NOAA's 21st-Century Priorities

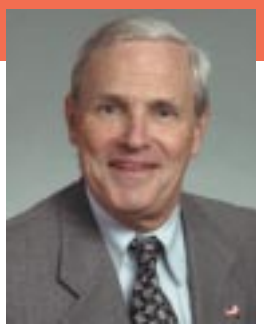
During FY 2004, NOAA revised its Strategic Plan for 2005–2010. The revision resulted from the efforts of NOAA employees working to implement the goals of NOAA's FY 2003–2008 Strategic Plan to reflect recent external events, changes to NOAA's operations, and nine months of advice and data received and collected from stakeholders across the Nation.

Strategic planning at NOAA is an ongoing effort that works best when those who benefit from NOAA's activities and those who provide NOAA's products and services can contribute to the process. Only by involving stakeholders, employees, and partners can we fulfill NOAA's vision and mission. NOAA's Strategic Plan is an important link between budget and performance. It is a critical tool to help steer NOAA in the best direction for the future, and to help design and create programs, allocate resources, and perform with better accountability for results. Through this plan, NOAA will advance toward achieving its goals and serving society in the best possible way.

Integrating Decision-making and Management Processes

NOAA achieved significant improvements in its corporate decision process by introducing matrix management and establishing a NOAA-wide, requirements-based management process linked with the agency's

James R. Mahoney, Ph.D.
Assistant Secretary of Commerce for Oceans and Atmosphere



Brig. Gen. Jack Kelly, USAF (Ret.)
Deputy Under Secretary of Commerce for Oceans and Atmosphere

Scott Rayder
Chief of Staff to NOAA Under Secretary of Commerce

Timothy R.E. Keeney
Deputy Assistant Secretary of Commerce for Oceans and Atmosphere

Photo: Scripps Institution of Oceanography

NOAA'S MISSION GOALS AND STRATEGIES–FY 2005–FY 2010

Mission Goals

NOAA's Line and Staff Offices execute activities required to achieve mission goals through NOAA's programs. The domains of the five mission goals are interrelated, sharing common science and technology challenges and stakeholder interests.

- Protect, Restore, and Manage the Use of Coastal and Ocean Resources Through an Ecosystem Approach to Management
- Understand Climate Variability and Change to Enhance Society's Ability to Plan and Respond
- Serve Society's Needs for Weather and Water Information
- Support the Nation's Commerce with Information for Safe, Efficient, and Environmentally Sound Transportation
- Provide Critical Support for NOAA's Mission

planning,
programming, and budgeting processes. The Planning, Programming and Budget Execution System (PPBES) is a formal, systematic structure for making decisions on policy, strategy, capability development/ deployment, and resource allocations to accomplish NOAA's mission.

NOAA has reached a major milestone in implementing the first full cycle of the PPBES process. The substantive work completed has yielded a clearer understanding of NOAA's capabilities for achieving its current mission, how well the agency is positioned toward moving NOAA into the future, and insights essential to the program plans currently being developed by NOAA goal teams.

Strengthening Links between NOAA Research and Operations

The NOAA Research Review Team was established in 2003 under the auspices of the NOAA Science Advisory Board (SAB) as a Federal Advisory Committee Act committee. This blue-ribbon panel reviewed NOAA's research enterprise and recommended ways to improve its efficiency and effectiveness.

The Review Team made recommendations for strengthening links between NOAA's research programs and operational units, and assessing the relevancy of NOAA's research programs to the needs of its operational units. The team presented its findings to the SAB. NOAA is working to implement these recommendations. The external review will be completed in August 2005, one year after the publication of the Research Review Report.

Improving NOAA's Administrative Services

During FY 2004, NOAA funded a study toward improving the quality and efficiency of the agency's financial and administrative functions. On September 20, 2004, NOAA established a Transition Management Assessment Team to assess the study's recommendations. Though a departure from NOAA's current approach to doing business, the study's new "Concept of Operations" supports a more streamlined organization that will improve customer service at significant cost savings. As a first step, the Transition Management Assessment Team will undertake a high-level assessment of the Budget, Finance, Acquisitions, Grants, Workforce Management, Information Technology, Facilities Management, and Environmental Compliance and Safety functions in NOAA's Line Offices.

Implementing a Functional Management Model

NOAA is implementing a functional management model for centralized administrative and financial services to establish direct lines of accountability from Headquarters business managers to financial and administrative staff located in NOAA's Administrative Support Centers. Functional business managers will be responsible for customer service and will be authorized to set policies, define procedures, direct staff, and align and allocate resources. Besides improving the existing management model, the functional management model will provide a clear point of accountability for senior functional managers, and should ensure more consistent policy application and service levels. Pending notification of the Appropriations Committees of both Houses of Congress of NOAA's intent to formally adopt a functional management approach, as an interim measure NOAA will institute matrix management in the financial and administra-

NOAA manages coastal and ocean resources to optimize benefits to the environment, the economy, and public safety. Photo: William B. Folsom, NOAA Fisheries

Strategies

NOAA's strategies address an end-to-end process that covers the following five fundamental activities.

- Monitor and observe the land, sea, atmosphere, and space to create an observational and data collection network that tracks Earth's changing systems.
- Understand and describe how natural systems work together through investigation and interpretation of information.
- Assess and predict the changes of natural systems, and provide information about the future.
- Engage, advise, and inform individuals, partners, communities, and industries to facilitate information flow, ensure coordination and cooperation, and assist in the use, evaluation, and application of information.
- Manage coastal and ocean resources to optimize benefits to the environment, the economy, and public safety.

Excellence in NOAA's Leadership

DISTINGUISHED CAREER AWARDS

The following NOAA employees received the Distinguished Career Award, which recognizes long-term achievement in advancing NOAA's mission and goals:

Raymond Assel, Office of Oceanic and Atmospheric Research

Linda Brown, National Environmental Satellite, Data and Information Service

Larry Carr, National Environmental Satellite, Data and Information Service

Bruce Collette, National Marine Fisheries Service

Alfred Corea, Office of Civil Rights

Walton Dickhoff, National Marine Fisheries Service

Thomas Grayson, National Weather Service

John Irwin, Office of Oceanic and Atmospheric Research

Warren Keenan, Office of Oceanic and Atmospheric Research

Patricia Kurkul, National Marine Fisheries Service

Rosalind Ledford, National Environmental Satellite, Data and Information Service

Melvin McLaughlin, National Weather Service

Bruce Morehead, National Marine Fisheries Service

Richard Parrish, National Marine Fisheries Service

Edith (Aida) Pettegrue, National Ocean Service

Gordon Thayer, National Ocean Service

Reyna Sabina, Yeun-Ho Daneshzadeh, and Claudia Schmid (left to right), flanked by NOAA Administrator Lautenbacher and NOAA Research Director Richard Rosen, were honored for pioneering the development of a system to deliver quality-controlled, global ocean data in real time to international operational and research oceanographic communities.
Photo: Ron Bell, Department of Commerce

DEPARTMENT OF COMMERCE AWARDS

Gold and Silver Awards

Six individuals, 11 groups, and 5 organizations in NOAA received the Department of Commerce Gold and Silver Medals. These awards annually recognize extraordinary achievements that support the Department's mission. The Secretary awards the Gold Medal, the Commerce Department's highest honorary award, for distinguished performance characterized by extraordinary, notable, or prestigious contributions to the Department and/or one of its operating units. The Silver Medal is awarded for exceptional performance characterized by noteworthy or superlative contributions.

Bronze Awards

The Under Secretary presented the Department's Bronze Award to 18 individuals, 41 groups, and 8 NOAA organizations. This medal is the highest form of honorary recognition for superior service to NOAA and the Department of Commerce.

NOAA AWARDS

Individuals and groups received the following NOAA awards during a ceremony held May 25, 2004:

- Administrator Awards, recognizing employees or groups who have made significant contributions to NOAA;
- Diversity Spectrum Awards, recognizing those who have made a special effort to enhance the NOAA workplace;
- Technology Transfer Awards, recognizing innovation; and
- Career Awards, recognizing long-term achievement in advancing NOAA's goals and mission

Key Congressional Hearings Highlights

Debra Larson, Director, Office of Legislative Affairs

Supporting Congressional Activities

The Office of Legislative Affairs coordinated briefings for all key members of Congress and Authorizing and Appropriations Committee Offices on the President's FY 2005 Budget Request. The briefings provided the factual basis for member support for the budget request in both the House and the Senate. To increase understanding about NOAA's programs, the Legislative Affairs Office coordinated site visits to Hawaii, Alaska, and other NOAA facilities for key Appropriations and Authorizing Committee staffs. In addition, Congressional members were continually updated on the series of destructive hurricanes and tropical storms that hit the Southeast and Caribbean, which culminated in the House's passage of a resolution commending NOAA.

Promoting the Conservation of Atlantic Tunas

Admiral Lautenbacher testified before the House Committee on Resources, Subcommittee on Fisheries Conservation, Wildlife, and Oceans that "Under NOAA's leadership, the International Commission for the Conservation of Atlantic Tunas (ICCAT) adopted several new measures to promote effective monitoring and reporting by members, ensure full compliance with ICCAT measures, and expand the scope and use of trade measures to deter illegal, unregulated, and unreported fishing.

Protecting and Restoring Coastal Resources

Dr. Richard W. Spinrad, Assistant Administrator, National Ocean Service, reported to the Subcommittee on Water Resources and the Environment Committee on Transportation and Infrastructure that: "NOAA is leading an interagency Portfields project to help coastal communities like New Bedford, Massachusetts, Tampa, Florida, and Bellingham, Washington, address contamination, restoration, and economic redevelopment issues related to port development, dredging, and Brownfields redevelopment. NOAA is also providing technical assistance, training, and support to states and communities (with increased efforts in the Great Lakes) to strengthen local and regional capabilities to restore or redevelop contaminated sites. These partnerships will restore valuable coastal resources and revitalize coastal communities in key areas."

FY 2004 KEY EVENTS

October 8, 2003

Secretary of Commerce Don Evans met with CEOs of the domestic shipbuilding industry to discuss the importance of domestic shipbuilding to the U.S. economy, as well as recommendations on how to aid manufacturing industries as a whole.

November 5, 2003

NOAA assessed penalties of over $500,000 and 1,350 days of vessel permit sanction against the owners and captain of a shrimp trawler for violating the Endangered Species Act and the Magnuson–Stevens Fishery Conservation and Management Act. A NOAA investigation revealed the trawler had been shrimping off the Texas coast for over 50 days with four turtle excluder device escape openings sewn shut and no bycatch reduction device.

November 13, 2003

The National Weather Service (NWS) forecast office in Little Rock, Arkansas, presented the John Campanius Holm Award to veteran weather observer Brother Anselm Allen, a monk at the Benedictine Abbey in Subiaco, Arkansas. Brother Anselm has been an NWS cooperative observer since 1965, but monks at the abbey have been taking weather observations for the last 105 years. More than 11,000 volunteers across the Nation take observations on farms, in urban and suburban areas, national parks, seashores, and mountaintops. The Holm Award is presented to 25 Cooperative Observer Program participants annually, and is one of the highest awards an observer can receive.

November 13–15, 2003

NOAA Fisheries and the eight regional fishery management councils co-hosted the inaugural fisheries management conference in Washington, D.C. "Managing Our Nation's Marine Fisheries–Past, Present, and Future" educated the public, policymakers, and the media on the fisheries management process; highlighted successful management and research initiatives; helped bridge the gap between perception and reality regarding fisheries management; and provided a forum for exchanging information and soliciting a wide range of perspectives on future management and marine research directions.

November 28–30, 2003

Vice Admiral Lautenbacher led the U.S. delegation to the second meeting of the Group on Earth Observation in Baveno, Italy, serving as U.S. Co-Chair. At this meeting the Group received initial reports from the subgroups on architecture, data utilization, capacity building, user requirements, and international cooperation.

KEY CONGRESSIONAL HEARINGS–FY 2004

Date	Congressional Committee	Subject	NOAA Witnesses
		2003	
October 14	House Committee on Resources, Subcommittee on Fisheries Conservation, Wildlife, and Oceans	Non-native Oysters in Chesapeake Bay	Frederick G. Kern III, Acting Chief, Coastal Resource Health Branch, National Centers for Coastal Ocean Science
October 22	Senate Committee on Commerce, Science, and Transportation, Subcommittee on Oceans, Fisheries, and the Coast Guard	Amendment 13, New England Groundfish	Dr. William T. Hogarth, Assistant Administrator, NOAA Fisheries
October 30	House Committee on Science, Subcommittee on Environment, Technology, and Standards	Space Weather	Dr. Ernest G. Hildner III, Director, Space Environment Center
October 30	House Committee on Resources, Subcommittee on Fisheries Conservation, Wildlife, and Oceans	International Commission for the Conservation of Atlantic Tunas	Dr. William T. Hogarth, Assistant Administrator, NOAA Fisheries
		2004	
February 26	House Committee on Resources, Subcommittee on Fisheries Conservation, Wildlife, and Oceans	H.R. 1856, Harmful Algal Bloom and Hypoxia Research Amendments Act of 2003	Dr. Richard Spinrad, Assistant Administrator, National Ocean Service
February 26	House Committee on Transportation and Infrastructure, Subcommittee on Water Resources and the Environment	FY 2005 NOAA Budget Request	Dr. Richard Spinrad, Assistant Administrator, National Ocean Service
March 9	Senate Committee on Energy and Natural Resources	Drought and Water Issues	Dr. Louis Uccellini, Director, National Centers for Environmental Prediction
March 11	House Committee on Resources, Subcommittee on Fisheries Conservation, Wildlife, and Oceans	FY 2005 NOAA Budget Request	Vice Admiral Conrad C. Lautenbacher, Jr., U.S. Navy (Ret.), Undersecretary of Commerce for Oceans and Atmosphere and NOAA Administrator
March 18	House Committee on Resources, Subcommittee on Fisheries Conservation, Wildlife, and Oceans	H.R. 3883, Reauthorization of the Atlantic Striped Bass Conservation Act	John H. Dunnigan, Director, Office of Sustainable Fisheries, NOAA Fisheries
April 1	House Committee on Resources, Subcommittee on Fisheries Conservation, Wildlife, and Oceans	Marine Turtle Conservation Act of 2004	Dr. Rebecca Lent, Deputy Assistant Administrator, NOAA Fisheries
April 15	House Committee on Resources, Subcommittee on Fisheries Conservation, Wildlife, and Oceans	Invasive Species in Hawaii	Timothy R.E. Kenney, Deputy Assistant Secretary of Commerce for Oceans and Atmosphere
April 29	Senate Committee on Commerce, Science, and Transportation	FY 2005 NOAA Budget Request	Vice Admiral Conrad C. Lautenbacher, Jr., U.S. Navy (Ret.), Undersecretary of Commerce for Oceans and Atmosphere and NOAA Administrator
April 29	House Committee on Resources, Subcommittee on Fisheries Conservation, Wildlife, and Oceans	International Fishery Conservation and Management Issues	Dr. William T. Hogarth, Assistant Administrator, NOAA Fisheries
June 16	House Committee on Resources, Subcommittee on Fisheries Conservation, Wildlife, and Oceans	Data Programs for Fisheries Management Purposes	Dr. Michael Sissenwine, Chief Science Advisor, NOAA Fisheries
June 29	Senate Committee on Appropriations; Departments of Commerce, Justice, and State; the judiciary and related agencies	Coastal Erosion and Flooding in Alaska	Dr. Thomas R. Karl, Director, National Climatic Data Center
July 13	House Committee on Resources, Subcommittee on Fisheries Conservation, Wildlife, and Oceans	Ocean and Coastal Observing Systems	Dr. Richard Spinrad, Assistant Administrator, National Ocean Service
July 15	House Science Committee, Subcommittee on Environment, Technology and Standards	NOAA Organic Acts	Theodore W. Kassinger, Deputy Secretary of Commerce

December 9–11, 2003
NOAA Fisheries' Marine Fisheries Advisory Committee (MAFAC) met in New York City to discuss bycatch implementation plans, budget status, aquaculture, ecosystem-based management, the status of the Ocean Commission's report, and a summary of the NOAA Fisheries' regional constituent meetings. MAFAC is federally chartered to advise the Secretary of Commerce on issues relating to the management of marine resources. The 21-member committee represents a broad cross-section of geographic, cultural, and political views.

December 10, 2003
NWS and representatives from NOAA's Office of Oceanic and Atmospheric Research and the U.S. Environmental Protection Agency (EPA) hosted an air quality constituent group meeting in Washington, D.C. Participants included representatives from state and local government, and private-sector air quality management/forecasting agencies. This meeting updated stakeholders on plans for and progress toward launching the NOAA–EPA air quality forecasting capability in the summer of 2004, and provided input to NOAA on the planned operational capabilities for air quality forecasting.

December 11–12, 2003
NOAA's Air Resources Laboratory and the Mississippi–Alabama Sea Grant Consortium convened a special meeting in Biloxi, Mississippi, to discuss collaborative efforts in mercury research, education, and outreach in the Gulf of Mexico and to identify mercury-related issues that need additional research. Information from this meeting is being used to develop a "life cycle of mercury" program that will follow mercury from its sources to its eventual bioaccumulation in living tissue.

December 15, 2003
Assistant Administrator for Fisheries Bill Hogarth addressed the annual meeting of the Atlantic States Marine Fisheries Commission (ASMFC) in New York City, regarding the partnership the Department of Commerce (DOC) shares with ASMFC toward rebuilding and sustaining healthy Atlantic coastal fisheries. Composed of 15 member states, the ASMFC focuses on interstate fisheries management, research and statistics, habitat conservation, recreational fisheries, and law enforcement.

December 22, 2003
NOAA Fisheries scientist Charles Fowler published a paper in the *Proceedings of the Royal Society, Biological Sciences* titled "Is Humanity Sustainable?" Raising the question of the sustainability of a species that is out of balance with other species, Fowler compared humans to other species of a similar size to determine if humans are a statistical anomaly with respect to several variables (e.g., geographic range, food consumption, population size). In all cases, he found that humans are well outside the statistical range, being several orders of magnitude more abundant than any other mammal of similar size.

January 28, 2004
The National Ocean Service brokered a partnership with Ekkosoft.us to provide faster, easier access to tide prediction data. Ekkosoft.us, a wireless application development firm, is providing tide information over cellular phones via data from NOAA's Center for Operational Oceanographic Products and Services, using an Ekkosoft.us program called Salt Water Tides. The program accesses data from NOAA servers to generate tide prediction graphics for thousands of coastal locations around the United States, providing high-tide, low-tide, sunrise, sunset, and moon phases for more than 2,300 locations.

February 3, 2004
Vice Admiral Lautenbacher presented to Maryland's Gov. Robert Ehrlich and Lt. Gov. Michael Steele a satellite image of Hurricane Isabel, which was processed by NOAA's offices of Satellite Operations and Satellite Data Processing and Distribution. Isabel caused major damage in much of Maryland, with extensive flooding in Baltimore and Annapolis.

February 3, 2004
NWS hosted a meeting with national fire management agencies in Boise, Idaho, to review the 2003 fire weather season in light of the 2003 "Interagency Agreement for Meteorological Services between the Wildland Fire Agencies and the NWS" and to discuss lessons learned during the season and ways to improve this partnership. Participants included fire weather representatives from the U.S. Forest Service, U.S. Bureau of Land Management, U.S. Fish and Wildlife Service, U.S. Bureau of Indian Affairs, and the National Association of State Foresters.

February 18, 2004
Vice Admiral Lautenbacher delivered welcoming remarks at the Space at the Crossroads Conference, hosted in Washington, D.C., by the United States Space Foundation in association with DOC, the Satellite Industries Association, the National Space Society, and the Washington Space Business Roundtable. The Admiral spoke on the value of Earth observations and NOAA's satellite programs, and underscored the importance of industry partnerships in these endeavors.

February 23–27, 2004
Vice Admiral Lautenbacher led the U.S. delegation to the third meeting of the Group on Earth Observation in Cape Town, South Africa, where the Framework document was fully negotiated and prepared for distribution to countries for comment and clearance.

March 19, 2004
Vice Admiral Lautenbacher, Deputy Under Secretary for Oceans and Atmosphere Jack Kelly, and Assistant Administrator for Weather Services David Johnson announced the Spring Hydrology and Drought Outlook. The event was held in DOC's Herbert C. Hoover Building in Washington, D.C.

March 23, 2004
Assistant Administrator for Fisheries Bill Hogarth met with key seafood buyers for the WalMart Corporation at its headquarters in Bentonville, Arkansas, to discuss the U.S. supply of shrimp and other seafood products. This was an effort by NOAA to broker a partnership between WalMart and the U.S. shrimp industry to relieve the economic impacts on the industry from increased imports of shrimp into the U.S. market.

April 13, 2004
President Bush signed into law the NOAA Corps bill (H.R. 2584), which contained a provision repealing a section of the 2004 Consolidated Appropriations Act that precluded NOAA Fisheries from spending funds to implement measures to reduce overfishing or promote rebuilding of fish stocks. In light of the repeal, NOAA Fisheries published the final rule implementing the Northeast Multispecies Fishery Management Plan.

August 2–20, 2004
NOAA scientists led a diving expedition off of the coast of North Carolina to learn more about a venomous predatory fish whose population appears to be growing in waters along Florida, North Carolina, and Bermuda. Over the past four years, the Indo-Pacific lionfish (Pterois volitans) has established itself as the first Pacific marine fish known to populate Atlantic waters, particularly around reefs off of the southeast United States. An aquarium fish popular for its brilliant colors, the venomous lionfish most likely was introduced to Atlantic waters by intentional or unintentional releases from aquariums.

August 4, 2004
Vice Admiral Lautenbacher addressed the plenary session at the Ecological Society of America's 89th Annual Meeting on "Federal Leadership in Ecological Research: Building on the Lewis and Clark Legacy." More than 4,200 policymakers, scientists, academics, and students attended.

August 5, 2004
In conjunction with the Marine Mammal Commission and partners from the scientific research, conservation, and aquaria communities, NOAA hosted the educational series "Marine Animals and Human Noise" at the National Aquarium in Washington, D.C. The series, which ran through November 2004, presented the state of the science about the types and uses of sound in marine environments, characteristics of sound and marine animal hearing, and biological and behavioral factors relevant to the effects of sound.

August 11–13, 2004
NWS participated in the annual meeting of the American Association of State Climatologists (AASC) in Ithaca, New York, briefing AASC members on the status of NWS climate services and training activities. NWS's participation strengthened its partnership with AASC and helped NWS achieve milestones related to the implementation and improvement of climate services at regional headquarters, River Forecast Centers, and Weather Forecast Offices across the Nation.

August 15, 2004
Vice Admiral Lautenbacher and other NOAA experts were featured in the Weather Channel special "High Tides." The 30-minute documentary discussed tides, the use of tide stations in coastal management efforts, and NOAA technological advances that have improved understanding of tides.

August 16–20, 2004
NOAA participated in the American Geophysical Union's 2004 Western Pacific Geophysics Meeting in Honolulu, Hawaii. NOAA researchers and NOAA-funded university scientists presented cutting-edge climate research on various topics, including the NOAA Mauna Loa Observatory, El Niño–Southern Oscillation, and climate models.

August 17–18, 2004
Assistant Administrator for Fisheries Bill Hogarth attended the Second Annual Rangeland Summit in Boise, Idaho. The summit focused on the Endangered Species Act (ESA) and how landowners, allotment holders, local and state government, and federal agencies can meet their ESA responsibilities in a collaborative approach to rangeland management. Dr. Hogarth participated in a panel discussion with representatives from the Departments of Agriculture and the Interior, the Idaho State Bureau of Land Management, and the Shoshone-Paiute Tribe.

September 10, 2004
NWS conducted a ceremony to dedicate the first Spanish-language NOAA Weather Radio All-Hazards transmitter to broadcast in the western United States. The transmitter is now on the air in the Coachella Valley of Southern California.

September 10, 2004
Rear Admiral Samuel P. De Bow, Jr., Director of NOAA's Office of Marine and Aviation Operations and NOAA's Commissioned Officer Corps, and Rear Admiral Richard R. Behn, Director of Marine and Aviation Operations Centers, assumed their new positions during a formal assumption of command ceremony. The ceremony was held at the Department of Commerce in Washington, D.C.

September 13, 2004
DOC Deputy Secretary Kassinger participated in the 50th anniversary rededication of DOC's laboratories in Boulder, Colorado. The facility includes laboratories for DOC's National Institute of Standards and Technology, NOAA, and the National Telecommunications and Information Administration. DOC's Assistant Secretary for Communications and Information Michael Gallagher and the National Science Foundation's Acting Director Arden Bement also participated.

September 13–15, 2004
DOC's White House Initiative for Asian American Pacific Islanders hosted an outreach and technical assistance event in Seattle, Washington, to inform constituents about contracting and business opportunities and grants available to their communities.

September 15, 2004
Vice Admiral Lautenbacher participated in the NOAA U.S. Coral Reef Task Force meeting and a media roundtable, where media representatives learned about NOAA's activities throughout the state of Florida. Timothy Keeney, Deputy Assistant Secretary for Oceans and Atmosphere and co-chair of the Task Force; Rick Spinrad, Assistant Administrator for Ocean Services and Coastal Zone Management; and Bill Hogarth, Assistant Administrator for Fisheries, also participated. Coinciding with this meeting, Australia's Great Barrier Reef Marine Park Authority dedicated a reef to Dr. Nancy Foster (1941–2000), a former Assistant Administrator for the National Ocean Service, to honor her commitment to and leadership toward marine conservation.

September 16, 2004
Vice Admiral Lautenbacher hosted the European Organisation for the Exploitation of Meteorological Satellites' (EUMETSAT's) new Director-General Dr. Lars Prahm and Director of Program Development Ernst Koenemann. NOAA's Initial Joint Polar System agreement with EUMETSAT for cooperation in the polar-orbiting operational satellite system was signed on November 19, 1998, enabling NOAA instruments to fly on European meteorological operational satellites beginning in 2003.

September 16–17, 2004
NOAA Research sponsored a climate change workshop at Colorado State University that brought together stakeholders representing the supply and demand sectors of carbon cycle research, research administrators, and policy analysts. Participants discussed and debated the findings of white papers and developed recommendations for a research agenda and institutional structure that will enable the U.S. Government to effectively provide carbon cycle information.

September 19–29, 2004
Dr. Michael Sissenwine, Chief Science Advisor and Director of Scientific Programs for NOAA Fisheries, led the 92nd annual meeting of the International Council for the Exploration of the Seas (ICES) in Vigo, Spain. Dr. Sissenwine serves as the president of ICES, which coordinates and promotes marine research in the North Atlantic and serves as a meet-

ing point for a community of more than 1,600 marine scientists from 19 member countries around the North Atlantic.

September 20, 2004

Assistant Administrator for Fisheries Bill Hogarth addressed the annual meeting of the Pacific States Marine Fisheries Commission in Seattle, Washington, updating the Commission on recent Administration activities affecting their member states. Representing California, Oregon, Washington, Idaho, and Alaska, the Commission is one of three interstate commissions dedicated to resolving fishery issues.

September 22–24, 2004

The Science Steering Committee of the U.S. Climate Variability and Predictability (U.S. CLIVAR) Program, a research project under the international World Climate Research Program, convened a special session sponsored by NOAA for its executive members in Woods Hole, Massachusetts. Funded by NOAA, the National Aeronautics and Space Administration, and the National Science Foundation, U.S. CLIVAR conducts research aimed at improving climate models for predicting intraseasonal to decadal climate variability. These models are being used to generate climate scenarios for the Intergovernmental Panel on Climate Change's 2007 Science Assessment Report.

September 27, 2004

Deputy Under Secretary for Oceans and Atmosphere Jack Kelly addressed the Council of State Governments' Annual Meeting in Anchorage, Alaska; Chief of Staff Scott Rayder addressed the U.S. Commission on Ocean Policy; and Assistant Administrator for Ocean Services and Coastal Zone Management Rick Spinrad joined a panel discussion on state coastal zone management programs at the meeting.

September 28, 2004

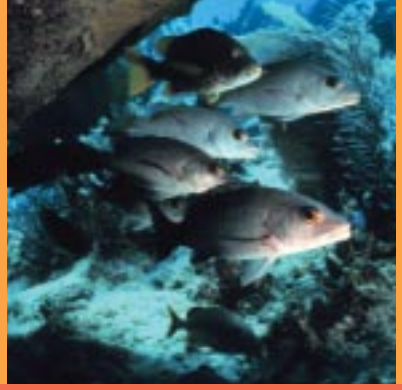
Representatives from the NWS forecast offices in Binghamton, New York, and Wayne County, Pennsylvania, dedicated a new NOAA Weather Radio All Hazards Transmitter serving the Pocono region of northeastern Pennsylvania. The NOAA All Hazards Radio Network is a nationwide network of radio stations broadcasting NWS weather warnings.

September 29, 2004

Rick Spinrad, Assistant Administrator for Ocean Services and Coastal Zone Management, spoke at the Dynamic Positioning and Marine Technology Conference in Houston, Texas. He addressed the critical need for continued research development in marine technology and dynamic positioning as the Nation moves toward a fully functioning Integrated Ocean Observing System.

September 30, 2004

Bill Hogarth, Assistant Administrator for Fisheries, was the keynote speaker at the annual Fish Expo Conference in Providence, Rhode Island. During the meeting, which was attended by representatives of the commercial fishing industry, Dr. Hogarth discussed the past, present, and future of fisheries management.



OPERATIONS, PRODUCTS, AND SERVICES

National Ocean Service

Managing and Conserving Coastal Resources

Richard W. Spinrad, Ph.D.
Assistant Administrator

The coastal environment is one of our Nation's most valuable assets. It provides food for people and essential habitat for thousands of species of marine animals and plants. A healthy coast is vital to the U.S. economy. Such industries as marine transportation, commercial and recreational fishing, tourism and recreation, and homebuilding all depend on a vibrant coastal environment. However, an ever-increasing, more concentrated population stresses the coast in many ways. The coast and its uses face threats from erosion, loss of wetlands, limited access, pollution, overdevelopment, and fierce storms. The challenge to the Nation and to the National Ocean Service (NOS) is to balance our use of coastal and ocean resources today with the need to protect, preserve, and restore these priceless realms for future generations.

ACCOMPLISHMENTS

Navigation

Online Forecasting System Launched for Galveston Bay

In June, NOS launched the Galveston Bay Operational Forecast System, which provides mariners, port managers, and emergency response teams with present and future conditions of water levels, currents, temperature, and salinity. These products will help port managers and shippers make decisions regarding maximum tonnage (based on bottom clearances) and limiting passage times, without compromising safety. The "nowcast" component of the system provides hourly updates and is driven primarily by real-time water levels and winds from the Galveston Bay Physical Oceanographic Real-Time System. The forecast component performs 30-hour forecasts, four times a day.

NowCOAST Web Site Improved

NOS released a new version of a Web mapping portal called nowCOAST, which provides spatially referenced links to real-time information from meteorological, oceanographic, and river-observing networks. In addition, nowCOAST provides links to NOAA's model forecast guidance, and weather and marine forecasts for major estuaries and seaports, the Great Lakes, and coastal regions. The improved Web site includes new links to observations from additional land and marine networks, and links to an additional 1,000 U.S. Geological Survey observing stations.

New PORTS® Stations Installed

New Physical Oceanographic Real-Time System (PORTS®) stations were installed in Tacoma, Washington, and New Haven, Connecticut. The system, which now has 12 installations across the country, provides accurate, real-time oceanographic and meteorological data to support safe, cost-efficient marine transportation. Tacoma is the fifth-largest container port in North America, handling more than 22 million tons of cargo annually, more than $5 billion in exports, and $21 billion in imports. New Haven annually handles nearly 11 million tons of cargo. Mariners will be able to use the PORTS® information to move cargo through narrow shipping lanes without their vessels running aground. In ports, water levels and currents fre-

quently differ from predictions as a result of changes in winds and water runoff. PORTS® is available online at http://tidesandcurrents.noaa.gov/d_ports.html.

Tide Information Available Via Cell Phone

This year, tide information was made available for the first time via cell phone. Working with ekkosoft.us, a wireless application development firm, NOS made vital information conveniently available to mariners, recreational boaters, fishermen, and beachgoers. Users access the information via a program developed by ekkosoft.us called *Salt Water Tides*, which generates tide prediction graphics for thousands of locations along the U.S. coast.

New Product Helps Hurricane-prone Areas

NOS launched the Storm Surge Quick Look, a new product that integrates storm-tracking information with water level storm surge and meteorological data from stations experiencing hurricane conditions. The information recorded—including wind speed, direction, gusts, barometric pressure, and temperature—will help hurricane-battered areas predict effects and determine courses of action. Much of the information used by the Storm Surge Quick Look originates from the NOS National Water Level Observation Network and from local observing systems.

New Navigation Tool Measures "Air Gap"

NOS made available a new navigation tool that measures clearance between the water surface and bridges, known as "air gap." The first sensors to measure air gap were placed on the center spans of two bridges over the Chesapeake and Delaware Canal. The sensors take readings every six minutes to account for changes in water level, volume of traffic crossing the bridges, and air temperature—all of which cause bridge clearance to fluctuate. As ships become taller, some are passing under bridges with just inches to spare. This new capability, which is available through PORTS®, provides quality-controlled oceanographic and weather data at U.S. seaports to aid navigation.

150-Year-Old Tide Station Commemorated

On June 30, San Francisco celebrated the 150th anniversary of a tide gauge that has collected an unbroken tide series since its installation. Part of the National Water Level Observation Network, the tide station has collected one of the longest continuous records of sea level in the world, and has transcended the maritime history of San Francisco. Its data have been instrumental in developing the area's nautical charts, delineating its shoreline, providing key information for regional restoration efforts, and estimating global sea level rise. A commemorative ceremony took place at the San Francisco Maritime National Historical Park

NOS surveys 95,000 nautical miles of U.S. coastline to provide an accurate and official delineation of the national shoreline for nautical chart production and coastal resource management. Photo: National Geodetic Survey

NOS Center for Operational Oceanographic Products and Services employees preparing to install a tide gauge on a pier in New England. This station will include a data collection platform, acoustic sensor with a protective tube, satellite antenna, various meteorological sensors, and a solar panel to keep the station battery charged.

Visitor Center, a park that welcomed more than 4 million visitors in 2003.

NOAA Continues to Build Outside Positioning Capabilities

NOAA's National Geodetic Survey (NGS) conducted 28 height modernization forums and meetings in 17 states. Some of these states have existing height modernization programs. Many, however, were formally introduced for the first time to the enormous benefits of height modernization. Height modernization provides accurate height information by integrating global positioning system (GPS) technology with existing survey techniques. For years, GPS has been used to determine accurate latitude and longitude (horizontal) positions. Now GPS can efficiently establish accurate elevation (vertical) data for all types of positioning and navigational needs. An independent report projected in some cases a 90 percent cost savings over conventional surveying methods.

Airborne LIDAR Used in Airport Surveys

Data derived from light detection and ranging (LIDAR) airborne surveys are now being used by the Federal Aviation Administration (FAA) to develop and publish an aircraft approach procedure. NOS provides the data on airport obstructions to the FAA, which is used to design runways approaches to help pilots land in bad weather. NOS conducted LIDAR surveys at two airports to ensure the data's accuracy, and NOS scientists are developing guidelines to be used in LIDAR surveys.

National Tidal Datum Epoch Updated

This year, NOS updated the National Tidal Datum Epoch (NTDE)—a 20–25-year record of relative sea level changes attributed to global sea level changes and long-term local land mass adjustments resulting from subsidence or glacial rebound. Known as the 1983–2001 NTDE, the new Epoch includes updated tidal datum and benchmark elevation information essential to coastal zone activities. This more accurate tidal information is useful for hydrographic surveys, mapping activities, navigation operations, wetland restoration activities, marine boundary delineation, coastal engineering, storm warnings and modeling, hazard mitigation, and emergency management.

More Electronic Navigational Charts Downloaded

By July 2004, 3 million electronic navigational charts (ENCs) had been downloaded from NOS's suite of online navigation tools—a significant milestone. Built to international standards, ENCs are considered "smart charts" that provide users with more

President Bush observed Earth Day 2004 and National Volunteer Day at Wells National Estuarine Research Reserve in Maine and Rookery Bay National Estuarine Research Reserve in Florida, respectively.

accessible and customizable nautical charts. They can be incorporated into GPS satellite data and other sensor information (e.g., water levels, winds, and weather) to warn mariners of navigation hazards and situations where a vessel's current direction will lead it into a dangerous area. ENCs are available online at http://nauticalcharts.noaa.gov/mcd/enc/.

New Research Vessel Commissioned, Hawaiian Coral Reefs Studied

In September, the newest NOAA research vessel, the *HI'IALAKAI*, was commissioned and began its inaugural mission in the Northwest Hawaiian Islands Coral Reef Ecosystem Reserve to monitor and assess the coral reefs. Together with the U.S. Geological Survey, the National Park Service, and the U.S. Virgin Islands (USVI) Division of Fish and Wildlife, NOS conducted a seafloor characterization and biological resource inventory of the USVI National Coral Reef Monument and Buck Island Reef National Monument. This research was part of the Coral Reef Ecosystem Integrated Observing System.

Ecosystems

Inventory of Estuaries Restoration Projects Released

In 2004, the NOAA Restoration Program released the National Estuaries Restoration Inventory, an Internet-accessible database of coastal habitat restoration projects across the country. The database includes information on restoration techniques and monitoring results. Users can search for projects via an interactive mapping tool, download project reports, and enter their own project information.

Pribilof Islands Restoration Project Nearly Complete

By the end of FY 2004, NOS had completed 90 percent of its planned cleanup activities in Alaska's Pribilof Islands. The islands, which are hundreds of miles off the Alaskan mainland in the Bering Sea, were contaminated by petroleum and heavy metals. NOS removed and treated or disposed of more than 50,000 cubic yards of contaminated soils and sediments, and installed 100 groundwater monitoring wells. Cleanup activities began in 1999, and have been carefully documented.

Plan for Operating Largest Marine Protected Area Completed

Over a three-year period, NOS staff held dozens of public meetings regarding the management of the 130,000-square-mile Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve. They facilitated discussions among partners and advisors, reviewed 27,000 public comments, and created guidelines for managing the reserve. The result of these efforts is a newly released operations plan that prioritizes issues, including marine debris, cultural resources, and research and monitoring activities. In addition, NOS is working to ensure the reserve is designated an official sanctuary.

Sanctuary Volunteers Help California Harbor Seals Rebound

With the help of dedicated volunteers, NOS has been able to stem the decline of harbor seals in the Gulf of the Farallones National Marine Sanctuary, off the coast of California. Since 1998, volunteers who are part of the Sanctuary Education, Awareness and Longterm Stewardship (SEALS) program have helped NOS staff create buffers around harbor seal rookeries to minimize disturbances and educate visitors about the seals. Their efforts have resulted in an astounding drop in seal pup deaths, with pup counts rising from around 20 in 1998 to more than 80 in 2003.

By the end of FY 2004, NOS had completed 90 percent of its planned cleanup activities in Alaska's Pribilof Islands. Photo: NOS Office of Restoration

Transplanted Corals Find New Home in Florida Keys

In 2004, the Florida Keys National Marine Sanctuary led an unprecedented effort to remove and save more than 3,500 colonies of coral in Key West Harbor before the U.S. Navy conducted a maintenance dredging project in the area. The saved corals are available to scientists all over the United States for research, aquaria, aquaculture demonstration projects, and transplantation for restoring sites where boats have grounded.

Coastal Hazards

CAMEO® Software Updated

Jointly developed by NOAA and the U.S. Environmental Protection Agency, the Computer-Aided Management of Operations (CAMEO®) System, a software application for chemical emergency planners and responders, contains a database of more than 6,000 hazardous chemicals and 80,000 synonyms and product trade names. Users can access, store, and evaluate information for developing emergency response plans.

New Coastal Response Research Center Created

In 2004, NOS and the University of New Hampshire (UNH) created the Coastal Response Research Center at UNH to focus on national spill response and restoration issues, to pursue response-related science and technology, and to serve as a principal resource for research in spill preparedness, response, and assessment.

NOS research divers help develop knowledge and products on living marine resource distributions and ecology throughout the Nation's estuarine, coastal, and marine environments to provide managers and scientists with an improved ecosystem basis for making decisions.

Forecast System for Harmful Algal Blooms Activated

During FY 2004, the Gulf of Mexico Harmful Algal Bloom (HAB) Forecast System became operational as the result of a major collaboration within NOS. The new ecological forecast system provides twice-weekly bulletins that can be used to determine the current and future locations and intensity of HABs and their likely impacts. Best known as the "red tides" caused by the toxic alga Karenia brevis, HABs can lead to shellfish closures, fish kills, dolphin and manatee deaths, and breathing problems in humans. They occur yearly along the coasts of all five Gulf Coast states. State and local managers can use the bulletins to guide their monitoring and response efforts. The new forecast system is a collaboration among NOAA, the Florida Fish and Wildlife Research Institute, the Florida Department of Agriculture, and the Mote Marine Lab.

High-resolution Imagery Provided During Record Hurricane Season

NOS played an active role in supporting those affected during this year's record hurricane season. At the request of the U.S. Coast Guard and state agencies, NOS provided 2,000 high-resolution digital images of the altered Florida and Alabama coastlines after Hurricane Ivan made landfall. NOS provided additional digital images of the Florida coastline following Hurricane Jeanne. NOS posted these images of the damaged areas on the Internet at www.geodesy.noaa.gov/ivan and www.geodesy.noaa.gov/jeanne within two days of each hurricane's landfall. These and other digital images support the nation's damage assessment and emergency response activities. In addition, the images will be used in

PRODUCTS AND SERVICES

Nautical Charts

NOS produces the Nation's nautical charts in paper and electronic formats. These charts are indispensable to safe, efficient marine transportation and national security.

Shoreline Mapping

NOS surveys 95,000 nautical miles of U.S. coastline to provide an accurate and official delineation of the national shoreline for nautical chart production and coastal resource management. The growth and sustainability of U.S. shipping, manufacturing, exports, and coastal development depend on accurate shoreline mapping.

Real-time Data

By providing real-time information about water levels, tides and currents, salinity, and weather conditions in ports, Physical Oceanographic Real-Time Systems® (PORTS®) mitigate coastal hazards and minimize delays in marine transportation. Recreational boaters also use PORTS® to avoid groundings and collisions during inclement weather.

Unique Ocean and Coastal Areas

NOS manages a system of 13 National Marine Sanctuaries and 25 National Estuarine Research Reserves. These unique areas foster scientific research, public education and recreation, and environmental stewardship through Federal, state, local, and private partnerships. They also contribute jobs and dollars to local economies.

Coastal Ecosystem Monitoring

By measuring water quality, contaminants, sources of pollution, biodiversity, and changes in the use of coastal land and waters, NOS helps states and communities to sustainably use and protect their valuable resources.

ongoing research to develop standards and specifications for acquisition of digital imagery.

Coastal Communities

Partnership Project Supports San Francisco Bay

In an effort to better manage and restore subtidal habitats, NOS and NOAA Fisheries developed a multidisciplinary collaborative project to support critical activities for San Francisco Bay. The recently updated San Francisco Bay Watershed Database and Mapping Project gives NOAA and its partners a geospatial framework in which to collect, explore, and analyze data on sediment and tissue chemistry, conduct bioeffects studies, and assess the quantity and quality of the bay's existing subtidal habitats.

NOS Leads Efforts to Revitalize Port Communities

Through the NOS-led Portfields initiative, federal, state, and local partners are working together and leveraging resources to assist three pilot ports in revitalizing waterfront areas, improving marine transportation, and restoring coastal habitat. Portfields is helping the City of New Bedford, Massachusetts, to streamline regulatory processes to expedite navigational dredging of New Bedford Harbor, which will enhance the local economy, improve the harbor environment, and increase pubic access to the waterfront. In Bellingham, Washington, Portfields leveraged resources to assist salmon restoration and waterfront revitalization, and is streamlining the permitting process. Portfields assisted Florida's Tampa Port Authority in planning and designing stormwater improvements to improve water quality in Tampa Bay and to serve as a national model for innovative stormwater management.

Restoration Guidance for Coastal Managers Published

The NOS Center for Operational Oceanographic Products and Services, Office of Response and Restoration, National Geodetic Survey, and NOAA Restoration Center recently published *Addressing Elevation and Inundation Issues in Habitat Restoration Planning and Implementation*. The guidance document is geared toward coastal restoration professionals in government, industry, academia, and nongovernmental organizations who need to know whether and how to use water-level information, geodetic positioning tools, and other technologies to support restoration project planning and implementation. Through three case studies, the document illustrates how NOS's navigation-based tools and methods can be applied to restoration projects. The report is available online at http://response.restoration.noaa.gov/cpr/library/publications.html.

NOS uses a variety of instrumentation to measure water quality, tide levels, current direction, and contaminates to help states and communities manage their natural resources.

Emergency Response

NOS responds to more than 100 marine oil and chemical spills every year, providing information to the U.S. Coast Guard for containing and cleaning up spills. NOS also works closely with the U.S. Environmental Protection Agency and other partners to protect and restore coastal resources damaged by releases of hazardous materials.

Pinpoint Positioning

NOS maintains the National Spatial Reference System, which serves as a baseline for all types of highly accurate navigation, survey, and positioning work. For example, the system enables ships to pinpoint their location within three to five meters at all times and in all weather, and is used as the basis for all Global Positioning System data.

Decision-making Support

NOS provides a wealth of science, training, and tools to help coastal communities make decisions about such concerns as land use, waterfront development and revitalization, habitat conservation and restoration, and water quality and quantity. For example, Geographic Information System maps of coastal habitats and information about storms and other risks help coastal managers mitigate a range of potential hazards.

Coastal Research

NOS conducts and supports research on a variety of issues that threaten coastal waters, habitats, and ecosystem and human health, including pollutants, harmful algal blooms, invasive species, and changes in land use and climate.

(Left to right) Terry Thompson (Education Coordinator), Senator Ted Stevens, Carmen Field (Outreach Coordinator), Amy Alderfer (Event Coordinator), VADM Lautenbacher, and Dr. Rick Spinrad at Kachemak Bay National Estuarine Research Reserve.

Coastal and Estuarine Land Conservation Program Progresses

The Office of Ocean and Coastal Resource Management implemented the FY 2004 portion of the Coastal and Estuarine Land Conservation Program. This year, the program awarded approximately $51 million to state and local governments for 35 projects around the contiguous United States to help preserve coastal and estuarine lands with significant conservation, ecological, recreation, historic, and aesthetic values. Once acquired, the lands will be protected in perpetuity as wildlife habitat and/or open space. Where appropriate, the sites will provide public access for passive recreation activities such as walking, birdwatching, and canoe and kayak launching.

Education and Outreach

U.S. Coast Guard Honors NOS HAZMAT

In March 2004, the NOS Office of Response and Restoration's Hazardous Materials Response Division (HAZMAT) received a U.S. Coast Guard (USCG) Certificate of Merit in recognition of its 20-plus years of support to the USCG during emergencies. NOAA HAZMAT first lent support to the USCG in 1976 during a spill from the tanker *Argo Merchant*. Since then, incidents have included oil and chemical spills, search-and-rescue operations, and natural disasters. HAZMAT's technical support ranges from weather forecasts to spill trajectories and oceanographic and biological data, which come both from HAZMAT headquarters in Seattle and field personnel permanently stationed in each USCG district.

Special Edition Published on Marine Protected Areas

The National Marine Protected Areas (MPAs) Center collaborated with the National Marine Educators Association to produce a special edition of *Current: The Journal of Marine Education* devoted to the topic of MPAs. The center worked with more than 50 authors, reviewers, editors, and illustrators from NOAA, the U.S. Department of the Interior, states, native Hawaiian organizations, and universities to published the edition. Among them was cartoonist Jim Toomey, creator of Sherman's Lagoon©. The articles cover a wide range of MPA-related topics, including the conservation of migrating birds and whales, dunes and marshes in national parks, shipwrecks in the Great Lakes, and traditional Hawaiian fisheries management. Available in both English and Spanish editions, the *Current* MPA edition will serve as the foundation for the center's educational activities in 2005.

NOS conducts research into new or improved oceanographic observing systems and designs software to improve data processing capabilities for increased navigational safety, more efficient marine transport, and better storm preparedness.

Maritime Heritage Program Launched

NOAA's National Marine Sanctuary Program has launched a comprehensive Maritime Heritage Program to enhance NOAA's stewardship responsibilities of submerged historic and cultural resources within the 14-site National Marine Sanctuary System, and to meet the goals of President Bush's Preserve America Executive Order. Among the primary federal programs addressing this important area of the American experience, the Maritime Heritage Program leverages NOAA's extensive experience in the investigation, management, and protection of shipwrecks, paleo-Indian sites, and other underwater cultural

The Center for Operational Oceanographic Products and Services collects and distributes oceanographic observations and predictions to ensure safe, efficient and environmentally sound maritime commerce.

resources. During FY 2004, the program worked in partnership with federal, state, local, and private organizations to locate, document, inventory, and protect more than a dozen historically significant shipwrecks in the United States—from the famed Civil War ironclad USS *Monitor* to the 19th-century steamer *Portland*, known as "New England's Titanic."

NOAA also neared completion of a Maritime Archaeology Center in FY 2004. Located in Newport News, Virginia, the center will provide technical assistance to sanctuary sites and will support federal, state, and local efforts to preserve America's maritime heritage for future generations.

New Center Educates Public about the Olympic Coast

During FY 2004, the Olympic Coast National Marine Sanctuary dedicated the new 800-square-foot Olympic Coast Discovery Center. The facility boasts a wide array of exhibits ranging from interactive kiosks to models of marine ecosystems, including a deep-water theater that provides visitors a firsthand experience of sanctuary research missions. The Discovery Center opening comes after nearly three years of planning and the fostering of sanctuary partnerships with numerous governmental agencies, including the National Park Service, Washington State Parks, and the Makah Tribe, as well as local citizen, tourism, and business groups. The center is expected to receive 42,000 visitors annually and will provide unprecedented educational and outreach opportunities to increase the public's awareness and enhance stewardship of precious sanctuary resources.

Extensive Research Collection Donated to Thunder Bay Sanctuary

Secretary of Commerce Donald Evans accepted the extensive Labadie/Perry Great Lakes Research Collection donated to Thunder Bay National Marine Sanctuary and Underwater Preserve. The collection is perhaps among the richest collection of 19th-century Great Lakes maritime history research material in the nation, including material reflecting the type of maritime archaeological resources in Thunder Bay National Marine Sanctuary and Underwater Preserve. The collection has a special emphasis on wooden shipbuilding technology, and includes thousands of books, manuscripts, maps and charts, shipbuilding plans, photographs, negatives, slides, vertical and card files, microfilm, and videos.

Science Channel Airs Broadcast of Sanctuary's *Portland* Steamship

In March 2004, the Science Channel, part of the Discovery Network, broadcast nationally a high-definition underwater documentary on the sinking of the steamship *Portland*. The wreck of the *Portland* resides within the Stellwagen Bank National Marine Sanctuary and is protected by sanctuary regulations. The documentary was the culmination of a multi-year project in partnership with NOAA's Office of Ocean Exploration, National Undersea Research Program, University of Connecticut, University of Maine, and Woods Hole Oceanographic Institute to conduct an archaeological assessment of this important piece of New England's maritime history. All 192 of the *Portland*'s passengers and crew perished when the ship went down during a ferocious storm on November 27, 1898.

National Marine Fisheries Service

Sustaining, Protecting, and Rebuilding Our Nation's Living Oceans

William T. Hogarth, Ph.D.
Assistant Administrator

NOAA's National Marine Fisheries Service (NOAA Fisheries) is dedicated to protecting and preserving our Nation's living marine resources and their habitats through scientific research, fisheries management, law enforcement, and habitat conservation. NOAA Fisheries is a world leader in fisheries research, providing sound scientific foundation for the stewardship of living marine resources. As a leading voice for commercial and recreational fisheries from the Atlantic Ocean and Gulf of Mexico to the Pacific Ocean, we use our interdisciplinary expertise in the biological, physical, and social sciences and in information technology to monitor, assess, and predict the status and trends of marine stocks, their natural environment, and the socioeconomic benefits they provide. NOAA Fisheries will continue to focus on conservation, management, and sustainable development as we face new challenges in the 21st century.

ACCOMPLISHMENTS

Four Fish Stocks Fully Rebuilt

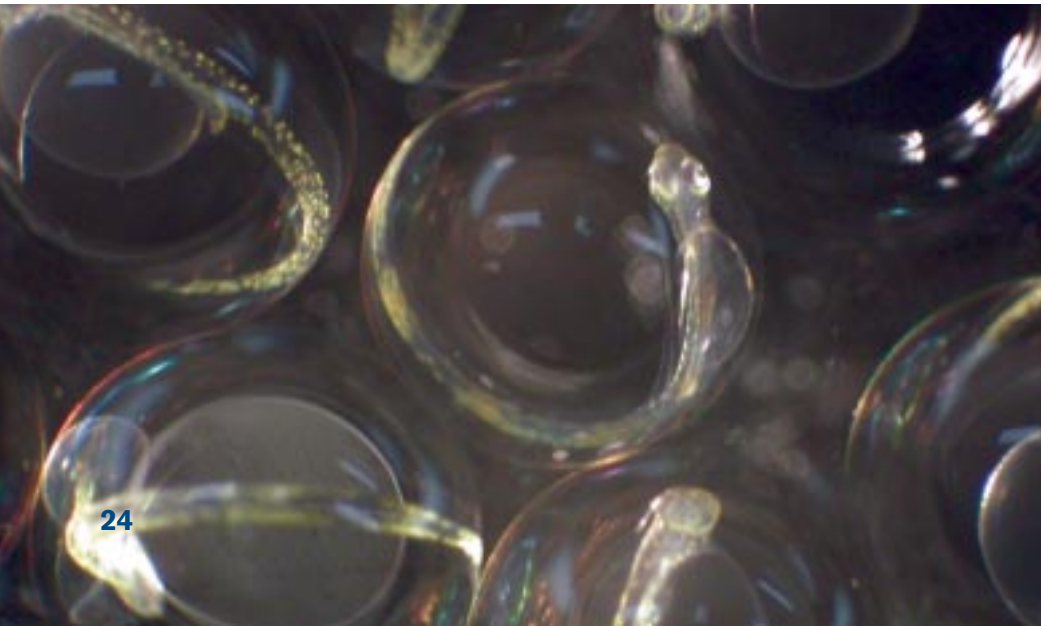
As a result of the Department of Commerce's efforts to conserve and manage the nation's fishery resources, four formerly overfished fish stocks are fully rebuilt: Georges Bank winter flounder in the Northeast, Atlantic blacktip shark, and South Atlantic and Gulf of Mexico stocks of yellowtail snapper. This is the first time that so many stocks have been declared rebuilt in a single year. This good news accompanies continued declines in the number of stocks that are overfished or subject to overfishing.

Report to Congress Shows Continued Progress

The *Report to Congress on the Status of U.S. Fisheries for 2003* showed that 10 stocks were taken off the overfished list over the last year as they continue to rebuild (76 in 2003 versus 86 stocks in 2002), and 6 stocks were taken off the overfishing list (60 in 2003 versus 66 in 2002).

Marine Debris Removed from Coral Reef

In FY 2004, the NOAA Coral Reef Conservation Program removed 61 tons of marine debris from the Northwest Hawaiian Island Coral Reef Ecosystem Reserve. To date, the



During FY 2004, the Department of Commerce reached a milestone in fully rebuilding four formerly overfished fish stocks in a single year. Shown here are fish eggs seen through a microscope.

In FY 2004, the NOAA Coral Reef Conservation Program removed 61 tons of marine debris from the Northwest Hawaiian Island Coral Reef Ecosystem Reserve.

program has removed 424 tons of marine debris, which has significantly reduced the threat of physical injury to coral reefs in this area.

Vessel Monitoring Significantly Increased

NOAA Fisheries is providing near-real-time tracking of more than 2,250 vessels in 14 different fisheries via a satellite-based vessel monitoring program. This is a 36 percent increase over 2003, and the coverage is expected to increase fivefold (8,308 vessels) by 2009. The program provides near-perfect compliance with open and closed seasons, closed areas, and international boundaries and management areas. It also provides critical information in support of the U.S. Coast Guard's search-and-rescue mission and, in some fisheries, provides a real-time communications link for transmitting to NOAA daily catch and effort information for use in managing fisheries quotas.

Fishery Observer Coverage Expanded

NOAA Fisheries expanded its observer coverage to 42 fisheries in FY 2004, monitoring nearly 60,000 fishing days, up from 45,000 in 2000. NOAA Fisheries also significantly improved its data quality by enhancing data checking and quality assurance procedures, emphasizing statistically valid and unbiased sampling methodologies, and providing better observer training that focuses on implementing new safety standards and incorporating more hands-on practice methods. New technologies were tested to digitally record all critical observer data, to improve access to real-time data, and to supplement observer coverage through electronic monitoring (video cameras).

Regulatory Streamlining Continues to Progress

NOAA Fisheries is continuing to make the regulatory process more efficient and effective for both the agency and its constituents. The Magnuson–Stevens Act Operational Guidelines, which describe the process and procedures for fisheries management by Regional Fishery Management Councils and NOAA Fisheries, have been overhauled to

NOAA Fisheries expanded its observer coverage to 42 fisheries in FY 2004, monitoring nearly 60,000 fishing days, up from 45,000 in 2000.

NOAA Fisheries' comprehensive blueprint addresses the most significant known threats to Atlantic right whales and proposes a suite of domestic and international changes in shipping operations and practices to reduce collisions with vessels.

simplify processes and document requirements. Advanced information technology has been implemented for capturing public comments on regulations electronically, and additional e-rulemaking features of notices, constituent comments, and *Federal Register* filings have been initiated. These efficiencies will help shorten the regulatory review and analysis cycle and make it easier to create an administrative record of policy decisions. Delegations of authority to regional managers have helped simplify the decision process.

Combining additional training and quality control steps in regulatory analysis and process, the agency is winning more litigation decisions while reducing future vulnerabilities. NOAA Fisheries has won 27 cases (87 percent) in 2004. This is a significant improvement compared to the 1997–2001 time period immediately following passage of the Sustainable Fisheries Act amendments, when the winning percentage averaged just 45 percent.

Protection Increases for Right Whales

Between 1975 and 2002, 38 collisions between ships and Atlantic right whales were reported. In FY 2004, NOAA Fisheries released its strategic plan to reduce ship strikes of this highly endangered species. The comprehensive, multi-year, multi-agency blueprint addresses the most significant known threats to Atlantic right whales and proposes a suite of domestic and international changes in shipping operations and practices to reduce collisions with vessels.

Collaborative Research Reduces Bycatch of Sea Turtles

Working with shrimp and longline fishermen, NOAA Fisheries scientists have developed a new soft Turtle Excluder Device (TED) and a highly effective double-flap hard TED that the shrimp industry has adopted to reduce the incidental capture of endangered and threatened sea turtles. Use of these devices promises to resolve risks of closures of the $406.5 million Gulf and South Atlantic fishery. Combined with full protection of Kemp's ridley nesting turtles and their nests in Mexico, these bycatch reduction initiatives have produced an increasing population trend for this endangered species.

Collaborative research on developing and testing new fishing techniques and circle hooks has also produced new longline fishing practices that reduce fishing interactions with leatherback and loggerhead sea turtles. These techniques have worldwide applicability. By reducing takes of sea turtles by 92 percent in the north central Atlantic Ocean, NOAA Fisheries was allowed to re-open 2.6 million square nautical miles of ocean to the swordfish fishery. In the Pacific, NOAA Fisheries re-opened

Working with shrimp and longline fishermen, NOAA Fisheries scientists have developed a new, soft Turtle Excluder Device (TED) and a highly effective double-flap hard TED that the shrimp industry has adopted to reduce the incidental capture of endangered and threatened sea turtles.

In FY 2004, NOAA Fisheries initiated regional ecosystem management pilot projects in the Atlantic Ocean and Gulf of Mexico.

the Hawaii longline fishery in March 2004, with requirements to use specific gear, bait, and fishing practices. The fishery was closed since April 2001 because of excessive bycatch of loggerhead and leatherback turtles, resulting in harvest losses totaling $33 million a year.

Thousands of Acres of Habitat Restored

Collaboration with national and regional agencies and alliances with over 330 community groups resulted in the restoration of 5,562 acres of habitat in 2004. Since 2001, NOAA has restored 18,965 habitat acres and opened 628 stream miles, with goals of 30,000 acres restored and 13,000 miles opened over the next five years.

Ecosystem Approaches to Fisheries Management Advanced

In FY 2004, NOAA Fisheries initiated regional ecosystem management pilot projects in the Atlantic Ocean and Gulf of Mexico. This activity included grants to four Regional Fishery Management Councils to seek public consensus on broader ecosystem management objectives involving key local, state, national, and international stakeholders; research and workshops on the identification of indicators of ecosystem health; and establishment of decision support tools, including geographic information system mapping techniques, public opinion survey instruments, and economic valuation techniques for eliciting and analyzing public preferences for different ecosystem objectives.

NOAA Fisheries also developed a discussion paper on potential guidelines for implementing collaborative ecosystem approaches to management by all Federal agencies and their regional, state, and local partners. The guidelines include institutional and process recommendations for identifying and implementing a common vision and strategic goals of an ecosystem approach that derives the greatest sustainable net benefits to the Nation. To help advance an ecosystem approach, a workshop of Federal and state agencies, Regional Fishery Management Councils, and nongovernmental organizations was held to delineate major ecosystem definitions and boundaries.

Hollings Marine Laboratory Opens

The Hollings Marine Laboratory, a multimillion-dollar research facility in Charleston, South Carolina, became fully operational in FY 2004. The laboratory, which provides for the application of medical technologies to issues of ecosystem health, is a partnership of five state, Federal, and private entities: NOAA, the National Institute of Standards and Technology, the University of Charleston, the Medical University of South Carolina, and the South Carolina Department of Natural Resources.

Communications with Constituents and Stakeholders Enhanced

NOAA Fisheries aggressively pursued improvements in communications with constituents and stakeholders during FY 2004. For example, over 1,000 people attended nine regional workshops, hosted by Assistant Administrator Hogarth,

The Hollings Marine Laboratory in Charleston, South Carolina, which became fully operational in FY 2004, provides for the application of medical technologies to issues of ecosystem health.

PRODUCTS AND SERVICES

Annual Report on the Status of Fisheries

The annual *Report to Congress on the Status of the Fisheries of the United States* reviews the status of 909 fishery stocks in the U.S. Exclusive Economic Zone and identifies stocks that are overfished or are approaching a condition of being overfished, under definitions mandated by the reauthorized Magnuson–Stevens Fishery Conservation and Management Act.

Regional Stock Assessments

NOAA Fisheries Science Centers provide the scientific basis for a wide range of management options for preserving living marine resources while supporting the economic performance of the domestic fisheries sector.

Seafood Inspection Services

NOAA Fisheries provides a variety of professional inspection services to the fishing industry, to ensure compliance with all applicable Federal food regulations. Annual participants include more the 2,500 importers and exporters.

Law Enforcement

NOAA special agents are charged with protecting the Nation's living marine resources under a variety of Federal laws and regulations. Enforcement activities include investigating criminal and civil violations; seizing contraband and illegal goods; implementing advanced technologies through a Vessel Monitoring System program to monitor and verify positions of fishing vessels using satellite-based tools; and Community-Oriented Policing and Problem Solving to promote voluntary compliance through public awareness and education.

Reduction of fishery overcapacity is essential to rebuilding and sustaining fisheries.

which focused on all aspects of NOAA Fisheries' performance; an additional 400 comments were received. The comments and suggestions were organized into 16 issues for response or action, and additional follow-up workshops are being planned for 2005. NOAA Fisheries also issued a series of new policies on state–Federal communications, establishing regional and national points of contact and new procedures and practices to strengthen partnerships and collaboration on mutual conservation and recovery goals with coastal states. In addition, with the assistance of the recreational fishing industry, NOAA Fisheries co-sponsored 10 regional meetings with recreational fishing stakeholders to assist the agency in creating a new NOAA Recreational Fishing Strategic Plan.

Overcapacity in Fishing Fleets Reduced

Reduction of fishery overcapacity is essential to rebuilding and sustaining fisheries. During FY 2004, NOAA Fisheries completed a $46 million fishing capacity reduction program in the Pacific Coast Groundfish trawl fishery. Appropriations paid for $10 million of the program's cost, and a loan repayable by post-reduction landing fees financed the remaining $36 million. The program permanently removed 92 groundfish trawlers from worldwide fishing and permanently revoked 213 groundfish trawl, pink shrimp, and Dungeness crab fishing licenses.

In addition, NOAA Fisheries issued an invitation for bid in a $100-million fishing capacity reduction program in the Bering Sea and Aleutian Islands crab fisheries. A loan repayable by post-reduction landing fees will repay 100 percent of the program's cost. The program will permanently remove crab fishing vessels from worldwide fishing and will revoke accepted bidders' crab fishing licenses and histories.

Key Restoration Monitoring Information Published

The National Ocean Service and NOAA Fisheries have compiled and published key restoration monitoring information applicable to coastal habitats nationwide. *Science-Based Restoration Monitoring of Coastal Habitats, Volume One: A Framework for Monitoring Plans Under the Estuaries and Clean Waters Act of 2000* offers technical assistance, outlines steps, and provides useful tools for developing and carrying out monitoring of coastal restoration efforts. One major component is a list of recommended monitoring parameters by habitat type, from which practitioners can choose their specific project. Groups are already recommending the document as the reference guide for designing monitoring for coastal habitat restoration projects.

FUTURE OUTLOOK

NOAA Fisheries bears the stewardship responsibility for the largest exclusive economic zone in the world. New legislation, evolving management philosophies, and scientific advances have created new opportunities for managing the Nation's living marine resources. We will continue to adopt the necessary tools and apply fiscal and programmatic resources to ensure the integrity of our marine ecosystems, and to sustain their socioeconomic and intangible benefits to the American people.

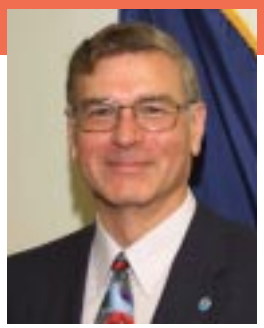
A major regulatory streamlining project is underway to enhance NOAA Fisheries' management programs for living marine resources. This project is particularly focused on integrating current statutes, such as the Magnuson–Stevens Fishery Conservation and Management Act, the National Environmental Policy Act, the Endangered Species Act, and the Marine Mammal Protection Act, as much as possible under their current structure, to address fishery actions more effectively. The project is also developing alternative collaborative processes, where appropriate, and working on permit processes.

Several other projects underway to modernize fisheries are taking advantage of recent developments in e-commerce, including a review of the Sustainable Fisheries Act, electronic rulemaking, and permit systems. In short, within two to three years NOAA Fisheries expects to significantly improve our conservation and management efforts, face fewer legal challenges, and generally providing better service to our constituents.

NOAA Fisheries provides a variety of professional inspection services to the fishing industry, to ensure compliance with all applicable Federal food regulations.

Office of Oceanic and Atmospheric Research

Where Science Comes to Life



Richard D. Rosen, Ph.D.
Assistant Administrator

NOAA's primary research and development organization, the Office of Oceanic and Atmospheric Research (NOAA Research), studies the Earth system from the deep ocean to the sun. NOAA Research delivers the products and services that help us to understand and predict environmental changes on local to global scales and at time scales from days to centuries.

The NOAA Research network consists of 12 internal research laboratories, an Ocean Exploration Program that conducts both internal and extramural research, and extramural research at 30 National Sea Grant university programs, 6 undersea research centers, a research grants program through the Office of Global Programs, and 13 cooperative institutes with academia.

Ultimately the information that NOAA Research provides is used by decision makers at all levels to prevent the loss of human life and conserve and manage natural resources while maintaining a strong economy. NOAA Research is integrated across three central research themes: ocean, coastal, and Great Lakes resources; climate; and weather and air quality.

ACCOMPLISHMENTS

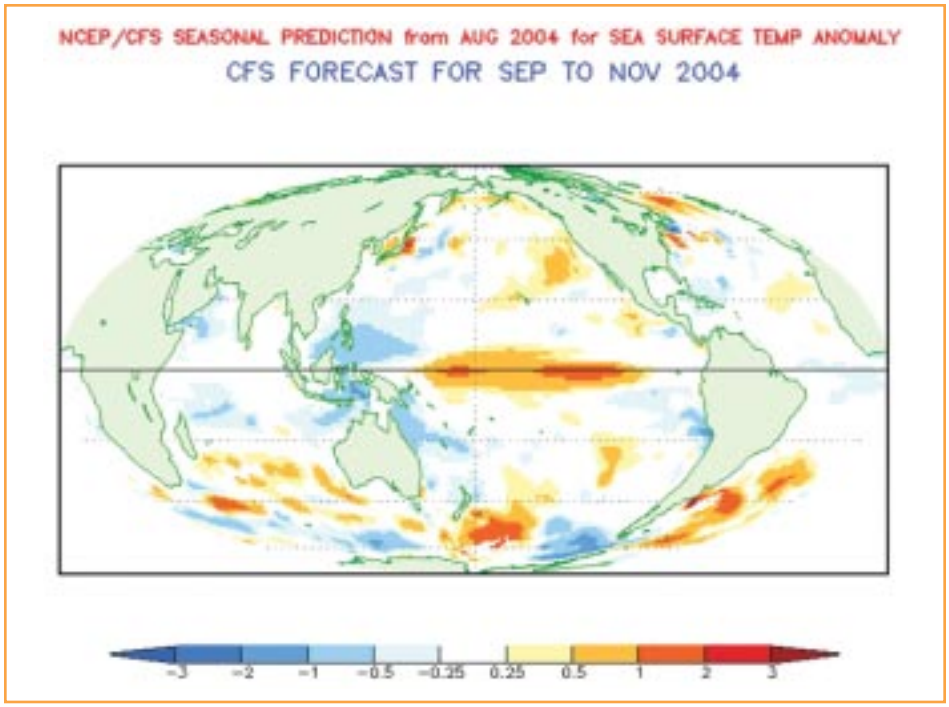
Successful Study Leads to Air Quality Forecasts

NOAA Research helped lead a multi-agency air quality and climate study that is enabling NOAA to develop the tools needed to provide reliable air quality forecasts in the United States. The research will lead to an improved understanding of the processes that influence air pollution levels and a better understanding of the linkages between air quality and climate. The study was performed under the International Consortium for Atmospheric Research on Transport and Transformation, which was based in New England in the summer of 2004.

NOAA Scientists Brave Hurricanes to Improve Forecasts

During the hurricanes that pummeled Florida and Alabama this summer, NOAA scientists were on the frontlines to advance modeling and monitoring efforts that could improve future storm forecasts. As Frances, Ivan, and Jeanne approached the United States, NOAA scientists flew into the storms and collected measurements and observations of multiple aspects of the storms, including interaction with the underlying

A NOAA scientist aboard a DC-3 aircraft studies a real-time display of ozone and aerosol data for the New England Air Quality Study.



The Climate Forecast System is a coupled model approach, representing the interaction between the Earth's oceans and the atmosphere. These interactions are critical for determining climate on seasonal time scales.

ocean as a part of the CBLAST intensity project—the Coupled Boundary Layer Air-Sea Transfer experiment.

Using the H*Wind system developed at the Atlantic Oceanographic and Meteorological Lab, scientists from the lab created "snapshots" of the wind speed and direction of each storm by incorporating multiple wind observations from surface buoys, dropwindsondes deployed from the planes, and such instruments as the Stepped Frequency Microwave Radiometer onboard the NOAA WP-3D aircraft. As the storms neared landfall, Air Resources Lab scientists dropped extreme turbulence spheres into the path of the oncoming hurricanes, and NOAA Sea Grant and the Florida Coastal Monitoring Program placed wind towers in the storms' paths. These extreme-turbulence spheres and towers, which can operate in extreme conditions, provided valuable supplemental data.

NOAA Advances Roadmap for a National Drought Information System

NOAA's Climate Program worked with Federal, state, and local government officials and the private sector to support the Western Governors' Association's development of a report titled "Creating a Drought Early Warning System for the 21st Century: The National Integrated Drought Information System." The document serves as a roadmap for the creation, operation, and management of an effective national drought information system. It focuses on user needs, observations and data requirements, tools needed, research and science, information dissemination and feedback, and recommendations to implement the system.

Critical Climate Forecast System Becomes Operational

In August, a global Climate Forecast System that models the interactions between the Earth's oceans and atmosphere became operational. These interactions are critical for determining climate in the seasons ahead. While the National Weather Service's National Centers for Environmental Prediction are the primary customers of this system's products, all customers will have access to these products in the near future. This project is a recent example of a successful transition of research into operations through long-term, ongoing collaborative efforts among scientists in NOAA's Geophysical Fluid Dynamics Lab, NOAA's Office of Global Programs, the National Centers for Environmental Prediction, the National Aeronautics and Space Administration, the National Science Foundation, and the university research community.

Key Findings Published on Carbon Dioxide in the Ocean

A landmark paper by scientists at the Pacific Marine Environmental Lab and Atlantic Oceanographic and Meteorological Lab estimates that 48 percent of the carbon released by burning fossil fuel during the industrial era has entered the ocean, making it the largest sustained sink of carbon over the last 200 years. This study represents the first observation-based inventory of anthropogenic carbon dioxide in the ocean. The potential impacts of increased anthropogenic carbon dioxide in the oceans on marine ecosystems were published in a companion paper in the same July 16 issue of *Science*. The companion paper noted that high concentrations of carbon dioxide reduced the ability of many marine organisms to produce calcium carbonate shells, including corals and animals on which other marine life feed.

New Centers to Study Linkages between Oceans and Human Health

This year, three NOAA research centers were established in Washington, South Carolina, and Michigan to study how humans affect the oceans and Great Lakes and how, in turn, those bodies of water can affect human health. The new NOAA Oceans and Human Health Initiative is designed to address these issues by

Ocean Exploration scientists launch the CTD, ("conductivity, temperature, depth") over the side of the research vessel THOMPSON *to take ocean measurements.*

bringing together expertise within NOAA and building external partnerships with experts from both the public and private sectors, including academia. The NOAA Center of Excellence for Great Lakes and Human Health at NOAA Research's Great Lakes Environmental Research Laboratory will use multidisciplinary research to develop technology for predicting the formation of toxic algal blooms, beach closings, and water quality in the Great Lakes basin.

Nationwide Mosaic of Radar Data Produced

Scientists at the National Severe Storms Laboratory, working with researchers from the Cooperative Institute for Mesoscale Meteorological Studies, have completed an ambitious project to seamlessly mosaic all 130 National Weather Service radars across the Nation. The mosaic provides the first high-resolution depiction of storms and quantitative precipitation estimation products from coast to coast in real time. The team developed a data delivery system for university, government, and private sectors, known as the Collaborative Radar Acquisition Field Test. Taking advantage of high-performance networking capabilities and other recent technological advances, the team successfully transferred the technology from the laboratory into NOAA's National Weather Service, private-sector operations, and research and educational facilities. The effort was recognized with a 2004 NOAA Tech Transfer Award.

Submarine Ring of Fire Yields Scientific Discoveries

An interdisciplinary team of 34 scientists from four nations explored the submarine volcanoes of the Mariana Arc on the so-called "Submarine Ring of Fire," discovering liquid drops of carbon dioxide rising from the sea floor, observing the co-mingling of sunlight-based life and chemical-based life, and filming for the first time an underwater volcanic eruption. Mission scientists agreed that this was the most exciting expedition they had been on from the view of the number and types of discoveries.

New Method Detects Sources of Water Pollution

NOAA Sea Grant researchers developed a method for detecting the presence of the human adenovirus, a cousin of the hepatitis A virus. The method was used to show that human viruses frequently contaminate coastal waters near river mouths in Southern California. These areas often have normal bacterial levels. The absence of a correlation between bacterial and viral contamination highlights the limita-

PRODUCTS AND SERVICES

Environmental Observation and Monitoring Networks

NOAA scientists collect air samples from all over the world to learn more about the composition of the atmosphere by monitoring ozone, recording solar radiation, and observing the oceans. Much of these data are collected through global partnerships. The measurements have allowed NOAA scientists to resolve important questions regarding oceanic and atmospheric variability. In addition, long-term observations of physical, chemical, and biological parameters are used to monitor current environmental conditions and to provide a baseline for assessing future changes.

Interagency Field Experiments

NOAA Research scientists lead field experiments focused on the study of exciting environmental phenomena. Fieldwork improves our ability to understand and predict the Earth's climate and atmosphere. Major campaign foci include exploring the links between oceans and atmosphere in the eastern tropical Pacific; natural and anthropogenic climate change by aerosols; intercontinental transport of manmade pollutants, such as ozone, fine particles, and other chemically active "greenhouse" compounds; and physical processes that occur in the ocean and atmosphere that are influenced by ocean waves.

Global Models

NOAA Research models of the atmosphere, ocean, and climate have increasingly sophisticated predictive capabilities, giving leaders in government and industry a greater understanding of the range of possible future outcomes of today's decisions.

Scientific Assessments

NOAA Research plays a leading role in periodically assessing the state of scientific understanding on many environmental issues facing government and industry decision makers, including climate change, air quality, and ozone depletion.

Operational Products

NOAA Research supports a variety of operational products, including:

- providing the Nation's official source of space weather alerts and warnings; and
- collecting real-time data from moored ocean buoys for improved detection, understanding, and prediction of El Niño and La Niña events.

Galatheid crabs and shrimp graze on bacterial filaments on mussels found at hydrothermal vents during Ocean Exploration's Ring of Fire expedition. NOAA's Ocean Exploration Program works to explore and better understand our oceans.

tions of current bacteria-based health standards. The Public Facilities and Resources Department in Orange County is using this new method to identify sources of contamination in the highly polluted Aliso Creek watershed.

Understanding of Monsoons and Regional Climate Patterns Enhanced

NOAA Research and the National Weather Service successfully completed the North American Monsoon Experiment (NAME) 2004 field campaign this summer, in collaboration with other U.S., Mexican, and Central American agencies and institutions. NAME 2004 provides an unprecedented collection of detailed atmospheric, oceanic, and land-surface observations in the core region of the North American Monsoon over northwest Mexico, the southwestern United States, and adjacent oceanic regions. The campaign will allow us to better document the evolution of the monsoon and to help understand the key physical processes for improved climate models.

NOAA Scientists Recognized for Achievements and Leadership

On June 23, Susan Solomon, senior scientist at the Aeronomy Laboratory and head of its Chemistry and Climate Processes program, was awarded the 2004 Blue Planet Prize. Solomon received the prize for identifying the mechanism that produces the Antarctic ozone hole and for her research on the linkages between ozone depletion and the Antarctic climate. In addition, Gabriel Vecchi of the Geophysical Fluid Dynamics Lab and Sim Aberson of the Atlantic Oceanographic and Meteorological Lab received the 2002 and 2003 Presidential Early Career Award in Science and Engineering for their research concerning El Niño and Indian Monsoon rainfall and hurricane track forecasts, respectively.

Sea Observatory to Study Hydrates and the Climate Connection

The NOAA Undersea Research Program-sponsored National Institute for Undersea Science and Technology at the University of Mississippi, together with the Department of Energy and the Minerals Management Service, is funding a seabed methane hydrate research observatory in the Gulf of Mexico. Research conducted at the observatory will improve the understanding of gas hydrates in relation to (1) geo-hazards to seafloor installations, (2) the significance for potential energy resources, and (3) the global climate implications of hydrocarbon gases venting into the seawater column and the atmosphere. The initial development of the observatory's first sensing elements is scheduled for 2005, with completion in 2006.

Sim Aberson of the Atlantic Oceanographic and Meteorological Lab receives an Early Presidential Career award from John H. Marburger III, Science Advisor to the President, and Donald L. Evans, Secretary of Commerce, for his research concerning El Niño and Indian Monsoon rainfall. NOAA Research has many scientists who make important contributions to meet our Nation's economic, social and environmental needs.

FUTURE OUTLOOK

NOAA Research strives to balance its near-term responsibility to address the needs of its primary customers both inside and outside of NOAA with its long-term commitment to conduct visionary research that will be critical for managing future environmental and societal threats. This dual responsibility requires us to perform research that leads to the transfer of information and new technologies, as well as to explore the unknown and develop important new concepts. Through increased dialogue with our constituents, we are working to be more responsible to our customers' and partners' needs and to engage our partners as we set new directions for research.

The NOAA Research vision is to create, through inspired research, the scientific basis for more productive and harmonious relationships between humans and their environment. Society will increasingly rely upon accurate weather and climate information to diminish the harsh impacts of droughts, flooding, and other environmental threats. NOAA Research is committed to building services that help citizens respond to these threats, as well as examining these phenomena for potential opportunities in key areas, such as agriculture and natural resource management.

National Weather Service

Working Together to Save Lives

David L. Johnson
Assistant Administrator

NOAA's National Weather Service (NWS) promotes public safety and the general welfare of the United States, its citizens, and its economy. NWS provides weather, water, and climate forecasts and warnings for the United States, its territories, adjacent waters, and ocean areas for the protection of life and property and the enhancement of the national economy. Weather services cost each American about $5 a year—roughly the cost of a fast-food meal. This investment allows NWS to issue climate, public, aviation, marine, fire weather, air quality, space weather, river and flood forecasts and warnings every day.

The United States is the most severe weather-prone country on Earth. Each year, Americans cope with an average of 10,000 thunderstorms, 2,500 floods, 1,000 tornadoes, as well as an average of 6 deadly hurricanes. Some 90 percent of all presidentially declared disasters are weather related, causing approximately 500 deaths per year and $11 billion in damage. Weather is directly linked to public safety, and about one-third of the U.S. economy (about $3 trillion) is sensitive to weather. Seasonal and interannual variations in climate, like El Niño, led to economic impacts on the order of $25 billion for 1997–98. All of these impacts are further magnified by current socioeconomic trends, such as population growth in severe weather-prone areas of the country, drought, and increasing demands for fresh water. In addition, key NOAA customers, such as industry, state and local governments, and emergency managers, are demanding more reliable and more specific weather, water, and climate information for use in key decision making. These multiple demands all point to the need to sustain and improve NWS's core observing, forecasting, and warning services.

The Nation's weather, water, and climate enterprise is conducted by many parties whose contributions complement and at times overlap. These parties are typically grouped into three sectors—government, private-sector entities, and the academic and research community—and include nongovernmental organizations and private citizens. This three-sector system has led to an extensive and flourishing set of services of great benefit to the public and the economy. NWS works closely with its partners in all aspects of the forecast process—from research, to observation collection, to forecast dissemination, to warning the public when hazards threaten. We rely on these effective partnerships to better understand and apply technology and science, continue our record of forecast improvements, and meet expanding needs for dependable, high-quality weather, water, and climate services. We are committed to foster the growth of this complex and diverse enterprise to serve the public interest.

ACCOMPLISHMENTS

Air Quality Forecasts Become Operational in the Northeast

NOAA began issuing Air Quality Forecasts (AQFs) for the northeastern United States, developed jointly by NOAA and the U.S. Environmental Protection Agency (EPA) in September 2004. The new AQFs predict hour-by-hour ozone levels through midnight of the following day, at 12-kilometer grid resolution. The information is posted and updated twice daily on NWS and EPA data servers. The AQF capability was developed and tested over the past two summers in the Northeast. Users of the forecasts may include state and local air quality forecasters, ozone-sensitive people, and private-sector partners who help distribute air quality alerts to the public. The nationwide phased implementation of the ozone air quality forecast capability will occur between 2004 and 2009.

Active Atlantic Hurricane Season Keeps NWS Busy

NWS predictions of an active Atlantic hurricane season foreshadowed a very busy August in 2004. The total of eight tropical cyclones reaching storm strength set a new August record, breaking the previous record of seven set in 1933 and 1995. Florida was hardest hit as Charley, Frances, and Ivan each pummeled the state over a six-week span, during which Americans relied on the National Hurricane Center (NHC) for predictions and information.

Of note, NHC forecasters correctly made a difficult call that Hurricane Charley would intensify before making landfall. NOAA's 5-day hurricane forecasts are as good as 3-day forecasts were 10 years ago, and forecasts of Hurricane Frances were even better than that. Numerous NWS and NOAA offices collaborated on Hurricane Ivan forecasts before and after it became the third storm in 2004 to hit Florida and then impacted interior states to the north with tornadoes, high winds, and floods. Between mid-August and mid-September, the NHC Web site had more than 2.5 billion hits, and NHC forecasters provided hundreds of television, radio, and print media interviews in the same period. In early September, a Congressional resolution was introduced to honor NOAA and its employees "for their dedication and hard work during Hurricanes Charley and Frances."

New Partnerships Protect Lives and Property

In June 2004, NOAA and the Department of Homeland Security (DHS) signed an agreement that allows DHS to send critical all hazards alerts and warnings directly through the NOAA Weather Radio All Hazards (NWR) Network. This partnership with DHS extends NWR's capabilities from primarily broadcasting weather forecasts and warnings to include a wider range of alerts and warnings, including both man-made and natural disasters, which will make critical information more readily available to the public. Alerts can be delivered nationally, regionally, or locally, giving DHS a strengthened capability to send emergency messages to national and targeted populations with minimum delay.

NOAA also collaborated in 2004 with the Consumer Electronics Association (CEA) and Environment Canada to establish a new performance standard for public alert receivers to protect lives and property. Public alert receivers for NWR broadcasts using the new industry standards will be entitled to bear a new certification from the CEA. The standard, titled CEA-2009–Receiver Performance Specification for Public Alert Receivers, defines minimum performance criteria for consumer electronic products designed to receive the digital alert signals broadcast by NWR and Environment Canada's Weatheradio network.

Secretary of Commerce Donald Evans flew aboard a NOAA P-3 Orion hurricane hunter during Category 5 Hurricane Ivan in September 2004. Photos: NESDIS and NOAA Library

Flash Flood and Monitoring Prediction Helps Pinpoint Warnings

Flash Flood and Monitoring Prediction (FFMP), a component of the NWS Advanced Hydrologic Prediction Service, gives emergency managers enough specific warning information to divert traffic away from flooded roads and bridges. For example, on May 12, 2004, a thunderstorm developed just south of Tunkhannock, Pennsylvania. The Binghamton, New York, Weather Forecast Office issued flash flood warnings about an hour before flooding hit the specific area mentioned in the warning. The thunderstorm was nearly stationary, producing more than six inches of in just a few hours. The specificity of the warning message and lead time allowed the Director of the Wyoming County Emergency Management Agency and his staff to take protective action by barricading roads and diverting school buses out of the affected area. No injuries or deaths were related to this flash flood.

NWS Introduces New Climate Forecast Model

In August 2004, NWS' National Centers for Environment Prediction (NCEP) implemented a new global coupled atmosphere–ocean Climate Forecast System (CFS) model. This is the first system capable of producing operational climate forecasts using a fully interactive computer model of the ocean–land–atmosphere system. Historically, the operational seasonal forecast process relied mostly on knowledge of past conditions and trends to make future projections. The CFS model takes into account the interactions between the ocean and the atmosphere, which are critical to determine the evolution of Earth's climate on seasonal time scales. The CFS will complement and significantly improve the existing seasonal forecasting process. Use of the CFS will lead to improvements in operational seasonal forecasts, which provide valuable guidance to many important economic sectors, including agriculture, energy, water resources, transportation, and the financial markets. NCEP's Environmental Modeling Center developed the CFS in cooperation with a number of government, university, private, and international partners.

NWS Supports Commodities Market

In February 2004, the NWS Climate Prediction Center (CPC) changed the release time for the official One- and Three-Month Outlooks and U.S. Drought Outlook products to 8:30 a.m. Eastern Standard Time in place of the previous 3 p.m. Eastern release time. Products are issued on the third Thursday of each month. Customers, especially in the commodities market and weather risk management sectors, have been requesting that CPC release its long-lead forecasts in the morning before the markets open, to provide U.S. markets an opportunity to react before foreign markets.

Wildfire Season the Worst in Alaska's History

Alaska experienced its worst fire season since officials began keeping records in 1939, with 680 fires burning over six million acres—an area larger than Maryland and Washington, D.C., combined. NWS forecasts helped ensure no loss of life from the fires, which at times ventured close to Fairbanks, necessitating evacuations. The U.S. Forest Service firefighters set up a logistical base of operations at the NOAA Fairbanks Command and Data Acquisition Station, and the Weather Forecast Office (WFO) in Fairbanks was in almost constant communication with various state and federal fire agencies during all major fire events. WFO Fairbanks prepared a record-breaking 447 spot forecasts during the season. Incident Meteorologists (IMETs) from California, Idaho, Minnesota, and Kentucky supplemented Alaska IMETs to provide on-site fire weather support, and augmented the WFO staff in response to the increase in spot forecasts and fire weather activities. Overall, the 11 IMET dispatches to fires in Alaska involved a total of 126 staff days. Although fire weather forecasts normally end the last week of August, NWS continued to provide forecasts until September 17, 2004.

NOAA Weather Radio All Hazards Alert Helps Save Lives

Following a NOAA Weather Radio All Hazards (NWR) alert, prompt action by a manufacturing plant in Roanoke, Illinois, kept as many as 140 plant workers safe in the face of an F4 tornado that devastated the

Max Mayfield, Director of NOAA's National Hurricane Center, briefed President Bush on Hurricane Frances at the Miami center on September 8, 2004. Photo: Eric Draper, White House

plant on July 13, 2004. The Parsons Manufacturing Company dispatched employee spotters based on NWR receipt of a Severe Thunderstorm Warning 12 minutes prior to the tornado. Plant management said employees were just starting to go to their designated shelters when the Tornado Warning was received seven minutes before the tornado hit. The company owner established a severe weather plan nearly 30 years ago when he started the business, and the plant had shelters made of steel reinforced concrete. The plant also holds regular emergency drills.

Following a NOAA Weather Radio All Hazards (NWR) alert in July 2004, prompt action by the Parsons Manufacturing Company in Roanoke, Illinois, kept 140 plant workers safe in the face of an F4 tornado that devastated the plant. Photos: Justin Weber (bottom right) and Steve Smedley

NEXRAD Level II Radar Data Are Available in Real Time

High-resolution radar data from the national network of Next Generation Radar (NEXRAD) were made available in real time in April 2004 to government, university, and private-sector users. NWS distributes the NEXRAD data through four top-tier sites. Three of these sites, Purdue University, the University of Oklahoma, and The Education and Research Consortium of the Western Carolinas, make Level II data available to all private-sector users equally on a cost-recovery basis without restriction on redistribution or use. The fourth site, the NWS Telecommunication Operations Center, makes data available through a collection of data communication services called the Family of Services. As an example of the value that the commercial sector places on this service, Bill Callahan of WSI Corp. stated: "Our customers are excited about what this allows us to do. Access to the full set [of NEXRAD data] allows us to see in full color, full resolution, and full volume what is going on in the atmosphere."

NOAA's DART (Deep-Ocean Assessment and Reporting of Tsunamis) system hit the bull's eye on November 16, 2003, when it detected a small tsunami generated by an earthquake near Adak, Alaska. Photo: Brett Taft, National Data Buoy Center

DART Buoys Provide Real-Time Tsunami Measurement

NOAA's Deep-Ocean Assessment and Reporting of Tsunamis (DART) system hit the bull's eye on November 16, 2003, when it detected a small tsunami generated by an earthquake near Adak, Alaska. This was the first time the DART system was able to capture tsunami data in real time since going operational in October 2003. The system is designed to be triggered into a rapid data-gathering mode by a strong earthquake's seismic waves, and then monitor and transmit real-time ocean surface data to NOAA's Tsunami Warning Centers in Palmer, Alaska, and Honolulu, Hawaii. In this event, the DART system nearest to the earthquake epicenter was triggered by the earthquake at 9:45 p.m. and captured the tsunami's arrival at 10:50 p.m. The amplitude of the small tsunami measured by the DART system confirmed expectations of the scientists on duty at the Tsunami Warning Centers and allowed the Tsunami Warning to be canceled very early in the warning process. Rapid confirmation that damaging tsunami waves have not been generated is equally important as warnings of damaging tsunami waves, eliminating the need for unnecessary, disruptive, and expensive evacuations.

American Samoa WSO Experiences First Tropical Cyclone

National Weather Service Office (WSO) Pago Pago was dedicated on November 3, 2003, just in time for the hurricane season. WSO Pago Pago is responsible for public service, coastal marine, tropical cyclone, climate, data acquisition, and facilities and electronics maintenance programs. Operating around the clock, the office issues public weather forecasts and warnings and high surf warnings in English and Samoan, and coastal and offshore forecasts out to 100 nautical miles. The WSO was put to the test in January as Category 5 Tropical Cyclone Heta passed through the Samoan Islands. WSO Pago Pago issued a Hurricane Watch with a lead time of 53 hours and a Hurricane Warning with a lead time of 16 hours. The new building, constructed to resist winds of up to 180 mph, came through with virtually no damage.

NOAA Weather Radio All Hazards (NWR) MOA Signed

To improve weather services in American Samoa, a Memorandum of Agreement (MOA) was signed by Governor Togiola Tulafono and Pacific Region Director Jeff LaDouce to establish a NOAA Weather Radio system. Under the terms of the MOA, the Government of American Samoa (ASG) through the Territorial

PRODUCTS AND SERVICES

Next-generation Radar (NEXRAD)

NWS forecasters use NEXRAD to detect and acquire information about tornados, severe thunderstorms (containing damaging winds, hail, turbulence, and lighting), and heavy precipitation (leading to flash flooding and heavy snow). NEXRAD is a tri-agency program of NWS, the Federal Aviation Administration (FAA), and the U.S. Air Force (USAF).

Automated Surface-Observing System (ASOS)

Getting more information on the atmosphere, more frequently, and from more locations is the key to improving forecasts and warnings. ASOS, the Nation's primary surface weather-observing network, observes, formats, archives, and transmits observations automatically. ASOS systems are designed to support weather forecast activities and aviation operations, along with the needs of the meteorological, hydrological, and climatological research communities. ASOS routinely and automatically provides computer-generated voice observations directly to aircraft in the vicinity of airports, using FAA ground-to-air radio. These messages are also available via a telephone dial-in port. ASOS transmits special reports when conditions exceed pre-selected weather elements thresholds. The ASOS program is a joint effort of NWS, the FAA, and the Department of Defense.

IBM SP Supercomputer

The IBM SP supercomputer runs complex numerical weather models that generate products that NWS and private-sector meteorologists use as the basis for their forecasts. The supercomputer's added capabilities and speed allow forecasters to predict extreme weather several days in advance.

Advanced Weather Interactive Processing System (AWIPS)

AWIPS is the central nervous system of NWS forecast operations and the information technology network that carries observations, data, and forecast models to NWS forecasters. With AWIPS, forecasters integrate and exploit all the data from the observing systems and numerical weather

Office of Homeland Security will pay for the system's equipment, infrastructure, and installation. NWS will operate and maintain the transmitter and will work with the ASG to establish an emergency alert system. Once in place, the system will fulfill a Homeland Security requirement for the ASG to install an all hazards early warning broadcast system for its citizens.

FUTURE OUTLOOK

In a world of rapidly expanding technology, scientific capabilities, and expectations, NWS faces the challenge of providing weather data and information to citizens, public officials, and private companies when and where they want it, in a form they can easily understand. To achieve this goal, NWS will obtain and use more data and will increase its computer power at its local offices and national centers to provide more accurate, frequent, time- and space-specific data and information than ever before. As NWS makes more of its data and information available in digital form, conversion into text, graphics, or other forms will be easier for NWS and others.

Crew members from the research vessel Kilo Moana *and the National Data Buoy Center's Lee Tretbar (right) prepare to recover the Pacific Marine Environmental Laboratory's NeMONet (New Millennium Observatory Net) Buoy off the coast of Oregon.* Photo: Brett Taft, National Data Buoy Center

State Rep. Gordon R. Pederson (R-SD, 30th District) visits with Kevin Barjenbruch (center) from the Salt Lake City Local Forecast Office and Bob Hansen (right) from NOAA's Office of Public, Constituent and Intergovernmental Affairs at the 2004 National Conference of State Legislatures annual meeting.

prediction models onto one platform. AWIPS enables rapid diagnosis of weather systems and the generation of timely, accurate warnings of severe weather.

NWS Telecommunications Gateway (NWSTG)

NWSTG is the Nation's telecommunications hub for collecting, processing, and distributing weather data and information. This telecommunications center provides national and global data exchange services using automated communication resources, transmitting a wide variety of environmental data. NWSTG operates around the clock to acquire and process observations; construct messages; and disseminate messages and files of observations, analyses, and forecast products. Customers worldwide use data processed by NWSTG, affecting a wide range of economic and emergency management decisions.

National Data Buoy Center (NDBC)

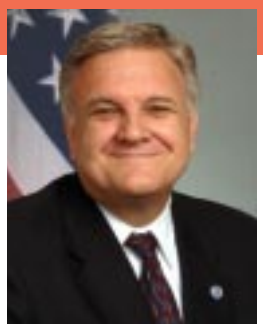
The NDBC is the focal point for data buoy and associated automated meteorological monitoring system technology. It provides operational, marine data from about 88 moored buoy stations in the Atlantic and Pacific oceans, the Gulf of Mexico, and the Great Lakes, and operates about 56 C-MAN (Coastal–Marine Automated Network) stations.

NOAA Weather Radio All Hazards (NWR)

At the end of FY 2004, 917 NWR transistors had been installed covering the 50 states, adjacent coastal waters, Puerto Rico, the U.S. Virgin Islands, and the U.S. Pacific Territories. Working with the Federal Communications Commission's Emergency Alert System, NWR is the single source for the most comprehensive weather and emergency information available to the public. NWR also broadcasts warning and post-event information for all types of hazards–both natural (such as earthquake and volcano activity) and environmental (such as chemical releases or oil spills).

National Environmental Satellite, Data and Information Service

The Nation's Eye on the Environment



Gregory W. Withee
Assistant Administrator

As the operator of the Nation's civil operational, environmental satellite system, NOAA's National Environmental Satellite, Data and Information Service (NESDIS) observes our Earth, our oceans, and our atmosphere every day and uses these observations to benefit all people and sectors of society. Composed of the Geostationary Operational Environmental Satellites (GOES) and the Polar-orbiting Operational Environmental Satellites (POES), the system provides the U.S. space-based component of a global environmental monitoring system. On behalf of the Department of Defense, NESDIS also operates the Defense Meteorological Satellite Program (DMSP) spacecraft. And on behalf of the Department of Commerce, NESDIS licenses the operation of commercial remote-sensing space systems.

NESDIS manages the largest collection of atmospheric, geophysical, and oceanographic data in the world. It contributes to the national economy by providing environmental data for energy distribution, the development of global food supplies, and the management of natural resources. NESDIS also provides data and information to a broad spectrum of users–for example, NOAA forecasters issuing severe storm warnings, researchers studying the environment, and national and international space agencies.

ACCOMPLISHMENTS

Nation Receives Critical Environmental Satellite Support

For special hurricane support, NESDIS satellite operations were reconfigured to provide rapid-scan, 5-minute imaging for an unprecedented week. This resulted in a 99.9 percent delivery rate for 584 images during hurricane Frances and a 100 percent delivery rate for 469 images during hurricane Charlie. Overall, NESDIS provided 12 months of nearly flawless operation of three satellite (GOES/POES/DMSP) constellations (consisting of 17 spacecraft), with a 99.5 percent success rate for providing mission-critical data satisfying customer requirements.

NOAA Provides International Leadership in Earth Observations

In November 2003, NOAA, as Chair of the Committee on Earth Observation Satellites (CEOS), hosted the annual plenary in Colorado Springs. At the plenary, CEOS members approved landmark principles for satellite data utilization, education, training, and capacity building that will be of direct benefit to developing nations. NOAA also played an active role in the June 2004 U.S.–India Conference on Space Science, Applications, and Commerce in Bangalore. Highlights included agreement in principle by India to installation of a National Polar-orbiting Operational Environmental Satellite System ground station in India, and agreement on both sides to pursue broader cooperation in data exchange and modeling as well as to investigate satellite instrument collaboration.

Weather Data Availability Rate Jumps from 45 Days to 3 Days

Severe weather damage results in billions of dollars in losses each year. Responding to the requests of constituents in the weather derivatives industry and other users, NOAA effectively reduced the time it takes to deliver high-quality weather observations directly to users from 45 days to no more than 3 days.

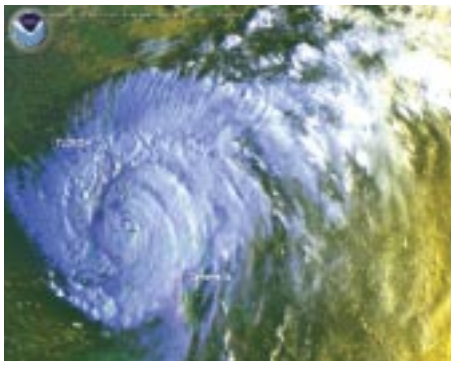
National Uncertainty about Climate Change Reduced

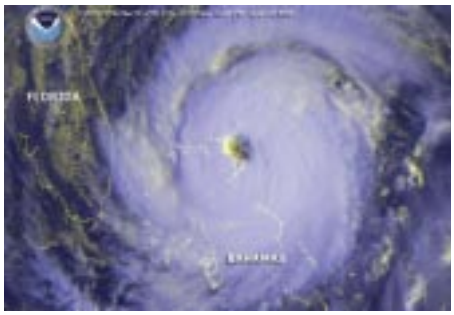
NOAA commissioned the U.S. Climate Reference Network (CRN) in January 2004 with 45 stations. By the end of FY 2004 the CRN has grown to 70 stations across the Nation. As a result, scientific uncertainty on long-term temperature and precipitation trends has been reduced from 5 percent to 3.5 percent for temperature, and from 16 percent to less than 10 percent for precipitation. An additional 19 CRN stations will be deployed in FY 2005, further reducing this uncertainty.

Plan Presented for Integrated Earth Observation and Data Management System

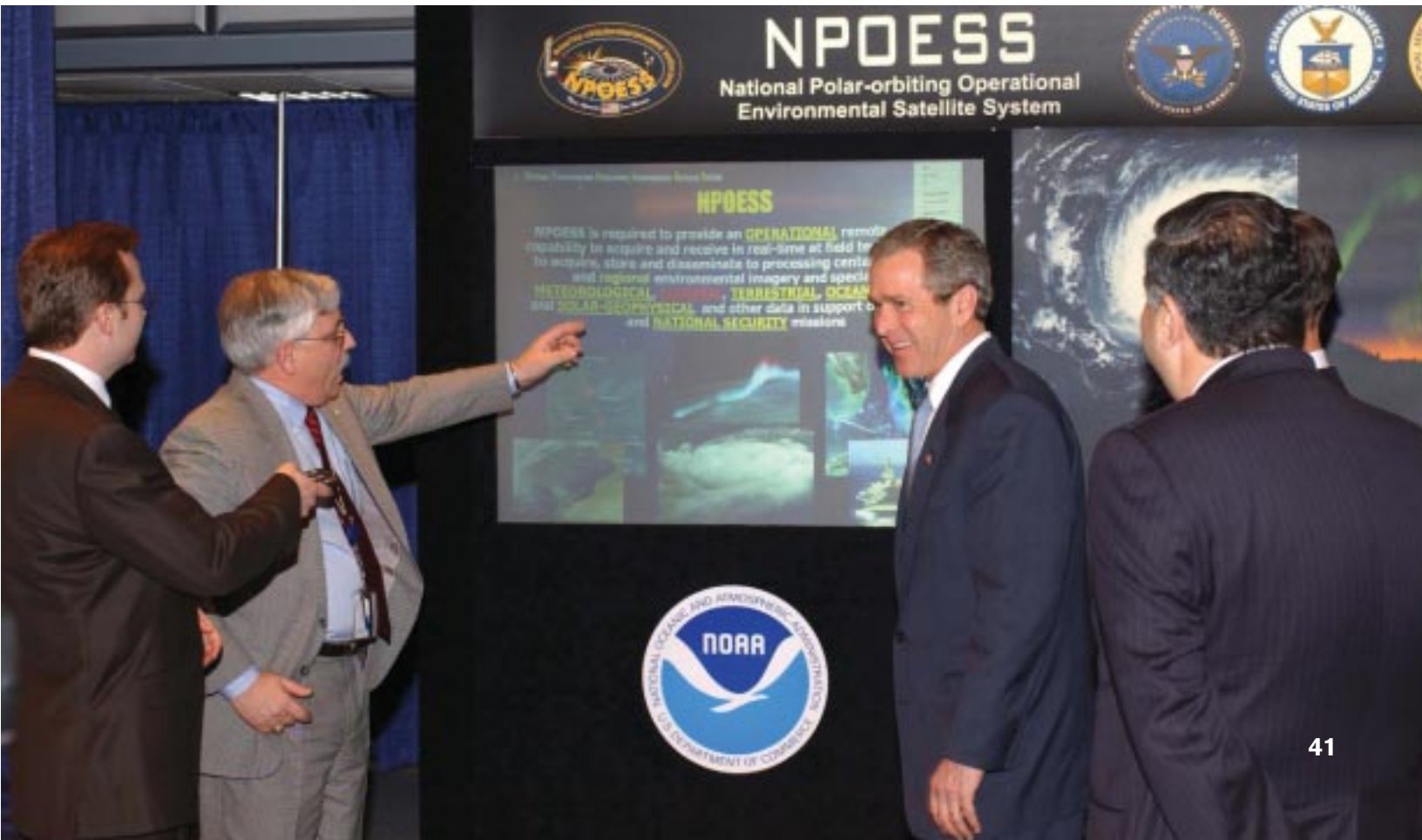
In July 2004, the NOAA Observing Systems Council published the *Strategic Direction for NOAA's Integrated Global Environmental Observation and Data Management System*. This document sets the stage for developing NOAA's integrated observation and data management system, and provides an overview of the process being used to examine requirements and prioritize observations. It describes how NOAA is addressing several challenges associated with this effort, and presents an initial observing system inventory. As part of this effort,

NESDIS Satellite Operations provided special reports for Hurricanes Frances and Charlie.





Dennis Berry (left) and John Cunningham demonstrate for President Bush and Secretary of Energy Spencer Abraham how the National Polar-orbiting Operational Environmental Satellite System is satisfying both civil and national security requirements for real-time, space-based, remotely sensed environmental data.



Dynamic view of past NOAA Satellite launch.

NOAA has documented the observation requirements across all NOAA programs and goal teams.

Continuity of Remotely Sensed Environmental Data Ensured

To maintain requirements for continuity of NOAA's remotely sensed environmental data from space, NESDIS has completed construction of GOES-N and NOAA-N and has readied them for launch. NESDIS also led the technical team in negotiating a plan to restore NOAA-N Prime to the polar-orbiting series. GOES-O and GOES-P remain on schedule to bridge to the GOES-R era.

New Environmental Data Products Developed

NOAA's National Data Centers have developed over 100 new climate, oceanic, and geophysical data products in FY 2004. In response to user demand for more timely, high-quality information, NOAA's National Climatic Data Center has developed a new automated quality control processing system that integrates data from several NOAA observing systems (surface, radar, satellites), greatly enhancing data quality and timeliness, and reducing the number of employees required for operations.

Experimental Satellite Products Transitioned from Research to Operations

NESDIS has accomplished the transition of 14 experimental products to operations in FY 2004, including surface vector winds from the National Aeronautics and Space Administration's QuikSCAT within the National Weather Service's AWIPS system at each Weather Forecast Office; the 4-kilometer-resolution Interactive Multisensor Snowmapping system; new data layers (vegetation, snow, precipitation) for the operational

PRODUCTS AND SERVICES

Weather and Climate Ocean Observation

NESDIS satellites provide a robust, integrated, comprehensive satellite observing system that protects the Nation and its economic infrastructure from the threats of severe weather, extreme environmental events, and unusual climate and their often devastating impacts. The global, continuous, environmental observations that NESDIS satellites provide drive weather and climate-forecasting models. NESDIS observations also contribute to the preservation of marine and coastal habitats, safeguard navigation and transportation, and provide search-and-rescue capability.

Geostationary Satellite System

NESDIS operates a system of environmental satellites in geostationary orbits to provide data for short-term weather warnings and forecasts. Known as GOES, these satellites orbit the Earth at 22,600 miles above the equator. Two GOES satellites remain operational at all times—one providing coverage for the eastern United States and most of the Atlantic Ocean, and the other providing coverage for the western United States and the Pacific Ocean basin.

GOES satellites provide images of the entire United States every 15 minutes. NESDIS can also acquire GOES images as frequently as every minute to monitor the development of severe weather. The National Weather Service uses GOES temperature and water vapor data in powerful numerical prediction models to form the basis of local weather forecasts and warnings of severe weather events. GOES images are also converted to videotape for use on national television weather shows.

Polar-orbiting Satellite Systems

The NESDIS Polar-orbiting Operational Environmental Satellite (POES) system provides an uninterrupted flow of critical global information used in numerical weather models. Continuous global temperature and humidity values from the POES system provide critical inputs for quality three- to five-day and long-range temperature, precipitation, and snow forecasts. The system also monitors global sea surface temperature, indicating the location, onset, and severity of such events as El Niño as early as possible. Longer lead times of these impending events allow emergency and agricultural managers to activate plans to reduce the impact of floods, landslides, and droughts.

The U.S. government has traditionally maintained two polar weather satellite systems, one for civil purposes and one for military purposes. In 1994, a Presidential Decision Directive created the National Polar-orbiting Operational Environmental Satellite System (NPOESS) to converge these programs. As implemented under the Presidential Decision Directive, NPOESS will save $1.6 billion over the life of the program, compared to the cost of continuing and upgrading the current series of POES and Defense Meteorological Satellite Program satellites. Administered by the Departments of Commerce and Defense and NASA, NPOESS will provide an improved and cost-effective, single national system capable of satisfying both civil and national security requirements for real-time, space-based, remotely sensed environmental data.

Integrated Hazard Mapping System; the National Hurricane Center SHIPS intensity forecast model with GOES and satellite altimetry data declared operational for the 2004 hurricane season; and the MODIS Polar Winds and Tropical Coral Reef Bleaching Indices.

COSPAS-SARSAT System Aids in 252 Rescues

COSPAS-SARSAT supported 224 rescues in 2003 and over 252 rescues to date during 2004. Since the COSPAS-SARSAT system became operational in 1982, it has helped to save more than 17,000 lives worldwide, including over 4,820 lives in the United States.

COSPAS-SARSAT is an international search-and-rescue system that uses satellites to detect and locate emergency beacons carried by ships, aircraft, and individuals.

Advanced NPOESS sensors will deliver higher-resolution atmospheric, oceanic, and terrestrial data, enabling more accurate short-term weather forecasts and severe storm warnings. NPOESS also offers the added advantage of serving the longer-term data-continuity requirements of the climate community for improved global climate assessment and prediction. NPOESS will also provide improved measurements and information about the space environment necessary to ensure reliable operations of space- and ground-based systems, and will continue to provide surface data collection and search-and-rescue capabilities. The tri-agency NPOESS program is well along the path to creating a high-performance integrated polar satellite system that will cost less, be more responsive to user demands, and deliver higher capability than that available today.

Environmental Data and Information Services

The NOAA Data Centers provide worldwide environmental data and information products and services in the atmospheric, marine, solid earth, and solar-terrestrial sciences to meet the needs of users in commerce, industry, agriculture, science, and engineering; the general public; and Federal, state, and local agencies. Environmental data and information maintained by NOAA are vital to practically every economic sector and are used in making decisions critical to national defense; industrial productivity; energy development and distribution; world food supplies; public health, safety, and welfare; and development of natural resources. Environmental scientists and observers also have a critical need for long time-series of historical and recent global data to assess long-term environmental trends, to evaluate the current state of the environment, and to predict future environmental conditions and events. This makes NOAA data archives a national treasure that our country must maintain.

National Oceanographic Data Center (NODC)

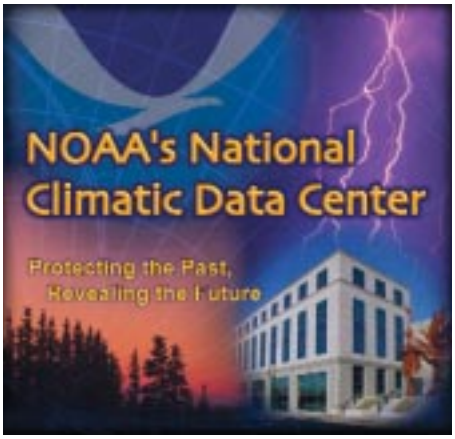
NODC in Silver Spring, Maryland, maintains the largest collection of publicly available oceanographic information in the world, including hundreds of millions of records gathered from ocean observation programs conducted over the past 150 years. These data document the physical and chemical properties of the oceans, currents, weather, and biota as observed from ships, buoys, and satellites.

The NODC provides access to these data to more than 270,000 users each year, including ocean researchers within NOAA, other agencies and academia, environmental program managers, educators, and maritime industries. Examples of these products and special topic data sets include the Marine Environmental Buoy Database, the Atlas of Surface Marine Data, and the World Ocean Circulation Experiment Data Set.

The NODC also operates the NOAA Library and Information System, which consists of the NOAA Central Library in Silver Spring, Maryland, and the Seattle and Miami Regional Libraries. The NOAA library data collection consists of more than 1.7 million volumes and thousands of visual images on topics related to NOAA's diverse missions. Access to the library collection and information services is available through the World Wide Web, which routinely handles more than 250,000 queries a month.

Draft National Plan for Integrated Earth Observation System Released

NOAA played an instrumental role in developing the draft Strategic Plan for the U.S. Integrated Earth Observation System, which the White House Office of Science and Technology Policy released for public comment on September 8, 2004. Created by the Interagency Working Group on Earth Observations, this document represents the collaborative efforts of 15 federal agencies and 3 White House offices. It describes an approach to developing a system that, over time, will benefit people and economies around the world by improving the ability to monitor, understand, and predict changes to the Earth. The release of this draft marks a significant milestone in the ongoing development of a Global Earth Observation System, involving nearly 50 other countries, the European Commission, and 29 international organizations.



NOAA'S National Climatic Data Center archives billions of meteorological observations, making it the largest climate data center in the world.

FUTURE OUTLOOK

International events and technological progress have reshaped the global context in which NESDIS operates. Anticipating this rapid pace of change is vital to creating NESDIS' vision for the future. Several factors—including future environmental observing capabilities, new information technology, and the growing needs and expectations of our numerous customers—will present opportunities for delivering improved products and services to meet future challenges.

Our national security, economy, and environment have become inextricably linked. No single environmental observing platform can fulfill all environmental remote-sensing requirements. Our customers need the best mix of observations from available and planned observing platforms and sensors. The upcoming expansion of advanced satellite instruments and data from such systems as the National Polar-orbiting Operational Environmental Satellite System and the European polar meteorological

National Climatic Data Center (NCDC)

Located in Asheville, North Carolina, NCDC archives billions of meteorological observations, making it the largest climate data center in the world. The NCDC receives, processes, archives, and disseminates surface, marine, upper air, radar, and solar radiation data and environmental observations.

The NCDC serves a large and diverse community, responding to more than one million requests a year. It makes environmental data and information available through on-line immediate Internet access and through off-line delivery of products. Users include climate researchers, engineers, agribusiness, emergency planners, attorneys, government agencies, and the public. Economic sectors benefiting from NCDC data include energy development and conservation, power and food production, healthcare, construction decision and scheduling, air pollution control, and transportation. The NCDC also performs climatic applications studies for other government agencies, including NASA, the Environmental Protection Agency, and the Departments of Defense and Energy.

National Coastal Data Development Center (NCDDC)

NESDIS established the NCDDC at the Stennis Space Center in Mississippi in 2002, to archive and provide access to the long-term coastal data record. Coastal resource managers, the research community, coastal weather forecasters, fisheries managers, and others have demanded that marine data be made more accessible to help our Nation acquire a better understanding of the health of our coastal environmental quality. The NCDDC's goal is to improve the quality of, and accessibility to, marine data characteristics, such as chemistry, biology, and geology, and such physical parameters as water levels, bathymetry, winds, and waves.

Working with Federal, state, and local agencies, academic institutions, nonprofit organizations, and the private sector, the NCDDC will create a unified, long-term database of coastal data sets. It will also develop and maintain a catalog of available coastal data, ensure the quality of these data, and provide on-line access to the coastal user community. Additionally, the NCDDC will produce retrospective analyses and trend information to help form the basis for environmental assessment and public policy.

National Geophysical Data Center (NGDC)

NGDC in Boulder, Colorado, ingests, compiles, archives, and disseminates a wide variety of scientific data ranging from information about the interior of the Earth to solar activities. The NGDC maintains more than 500 unique databases that contain information on natural hazards, such as tsunamis, volcanoes, earthquakes, and phenomena in space; studies of Earth's magnetic and gravity fields; topography and ecosystems; marine geology and geophysics; glaciology; upper atmosphere physics; and the space and solar environments.

The NGDC meets the needs of a diverse community of users, servicing more than 1.5 million requests a year. Data users include scientists; researchers; the private sector; Federal, state, and local governments; academia; and the public. The NGDC places particular emphasis on providing data to the Earth science research community to support work on global change, resource exploration, and basic science. The NGDC also operates World Data Centers for Solar-Terrestrial Physics, Marine Geology and Geophysics, and Solid Earth Geophysics at its Boulder location.

satellite program (MetOp) is a daunting challenge, as we move toward the production of significantly better forecasts from numerical weather prediction models.

In this new century, our greatest challenge is to use operational satellite observing systems comprehensively so as to extract the best-quality products possible as we plan for observing systems that serve both weather and climate system needs. We must also realize the full potential of current and future satellite and ground-based data, and provide timely environmental data relevant to current and future economic and environmental issues on local, regional, national, and global scales.

To be the source for the most comprehensive and easily accessible satellite products, data, and environmental information and assessments in the world, NESDIS will continue to operate and develop the world's premier environmental satellite systems, leading efforts with other agencies and countries to establish a global observing system to meet the world's weather, climate, ocean, and hazards support information needs. NESDIS will also implement new technologies to archive and provide access to massive amounts of new data becoming available that describe our climate, fulfilling growing customer requirements for quality and timely state-of-the art products and services. Those technologies include synthetic aperture radar, hyperspectral imaging, and the laser-based Light Detection and Ranging (LIDAR) instruments.

NOAA Search-and-Rescue Satellite-Aided Tracking (SARSAT) System Saves Lives

COSPAS-SARSAT is an international search-and-rescue system that uses satellites to detect and locate emergency beacons carried by ships, aircraft, and individuals. The system consists of a network of satellites, ground stations, mission control centers, and rescue coordination centers. Following are some highlights of SARSAT rescues during FY 2004.

Emergency beacons used in the COSPAS-SARSAT search-and-rescue system.

Rescue Dates & Sites	Rescue Details
• 11/16/03 • 66 nautical miles (NM) southeast of Barrow, Alaska	After activating their Personal Locator Beacon, two operators of broken-down snow machines were rescued and transported back to Barrow.
• 11/17/03 • 4 NM northwest of Todos Santos Island, Mexico	The Coast Guard launched a helicopter to the sailboat *Lizard*, and transported the crew member who had a seizure to a local hospital.
• 11/19/03 • 35 NM south of Lake Charles, Louisiana	The fishing boat *Miss Christine V* had lost its anchor and both engines. Once SARSAT detected an emergency radio beacon, the Coast Guard located the ailing vessel and towed it to safety.
• 7/12/04 • New Orleans, Louisiana	The *Amvina II* alerted the Coast Guard that it was taking on water. Unable to obtain the fishing boat's position because of a poor cell phone connection, the Coast Guard advised the fisherman to manually activate his emergency beacon. Once SARSAT detected the signal, the Coast Guard launched a helicopter to the area and lowered pumps to the disabled boat, which was successfully dewatered and traveled to port under its own power.
• 7/17/04 • Galveston, Texas	SARSAT detected a distress signal from *Lucky Year*, which was taking on water and barely staying afloat. The Coast Guard helped dewater the fishing boat and safely towed the Lucky Year and its crew to Galveston.
• 8/7/04 • 130 NM northeast of Bermuda	The Coast Guard launched a helicopter to the scene of a distress signal from a sailing vessel, established communications with assistance vessels *Golar*, *Olivia*, and *Maersk*, and diverted them to the scene. No injuries were reported, and everyone aboard the sailing vessel was taken safely into port.
• 8/11/04 • Tanacross, Alaska	SARSAT detected a distress signal from a hunter who had broken his leg. The hunter was located and medivaced to Alaska's Fairbanks Memorial Hospital.
• 9/15/04 • 500 NM northeast of Hilo, Hawaii	When SARSAT detected an emergency radio beacon from the sailboat *RA*, the Coast Guard launched an aircraft and located the boat, which was taking on water. The motor vessel Katsura rescued the crew of one from his life raft.
• 9/15/04 • 16 NM north of Cape Yakataga, Alaska	When SARSAT detected a distress signal, the Coast Guard launched a helicopter from Cordova, Alaska, and transported the pilot to safety.

NOAA Marine and Aviation Operations

On the Sea and in the Air

Rear Adm. Samuel P. De Bow, Jr. Director, NMAO and NOAA Corps

The mission of NOAA Marine and Aviation Operations (NMAO) is to manage, operate, and maintain the Nation's largest civilian fleet of research and survey ships and aircraft, which collect data for NOAA's environmental stewardship assessment and prediction programs. NMAO also manages NOAA's Diving Program. NMAO is composed of civilians and the NOAA Commissioned Officer Corps, one of the Nation's seven uniformed services.

NOAA ships operate worldwide, supporting a wide range of common and unique oceanic and atmospheric activities, including fisheries and coastal research, nautical charting, and long-range ocean and climate studies. The ships are equipped and designed to support NOAA and non-NOAA programs, and have data collection capabilities not found in the commercial fleet. For example, NOAA fisheries vessels can conduct joint operations of fishery stock assessments and oceanography, giving scientists a complete picture of a fish species, its habitat, and its surrounding environment.

NOAA aircraft operate throughout the Nation, collecting data for programs ranging from hurricane prediction research, to snow-pack surveys for flood prediction and water resource management, to coastline mapping for erosion studies, to marine mammal surveys. NOAA's aircraft are unique, being continually modified to carry instruments needed to support NOAA and non-NOAA missions.

NOAA Corps officers operate and manage NOAA ships and aircraft and bring their operational expertise and knowledge of platform capabilities to land-based assignments. NOAA Corps officers work in locations as diverse as NOAA's mission, serving in management and technical positions throughout all Line Offices of NOAA.

ACCOMPLISHMENTS

Aircraft Operations Center Takes on Intense Hurricane Season

During the active 2004 Atlantic hurricane season, NOAA aircraft flew 65 missions in support of hurricane surveillance, reconnaissance, and research. Storms tracked included Tropical Depression 2 (which became Hurricane Bonnie) and U.S. landfalling hurricanes Charley, Frances, Ivan, and Jeanne.

NOAA aircraft logged more than 475 flight hours, flew 100,000 nautical miles of track lines, and launched 1,200 dropsondes into storms to take meteorological observations. Aircraft flew back-to-back missions for days on end during the height of this busy period from several locations in the Caribbean and United States, while personnel endured four evacuations of NOAA's Aircraft Operations Center located on MacDill Air Force Base in Tampa, Florida.

With the cost of coastline preparation and evacuation estimated at over $1 million per mile, the recent improvement in landfall forecasts of up to 25 percent—due to data collected by NOAA's Gulfstream-IV jet and incorporated into computer models—saved many lives and millions of dollars. Wind-field data collected by special instruments carried aboard NOAA's two P-3 research aircraft were key in refining the regions of the storms where the most destructive winds were located.

The unusual frequency and intensity of storms during the 2004 hurricane season required peak performance from both the aircraft and the personnel who maintain and fly them, especially amidst an extremely challenging operations tempo and requirements to originate flights in one location and recover in another.

NMAO Supports Homeland Security Preparedness

A NOAA Corps officer is the director of NOAA's Homeland Security Program Office, and in FY 2004 NOAA Corps officers continued to be in the vanguard of those advancing NOAA's homeland security efforts—specifically, keeping the agency up and running in the event of an emergency. Along with other NOAA Line Office representatives, a rotating NOAA Corps watch officer integrates NOAA's assets and services into national homeland security operations at the Department of Homeland Security's Operations Center.

Recent national security training events and the unusually intense 2004 hurricane season required NOAA Corps officers and other Line Office personnel to staff the Operations Center with round-the-clock support. Utilizing hydrographic survey techniques, NOAA Corps officers are leading the effort to establish a mine-detection capability with the U.S. Navy and Coast Guard in the Nation's ports in support of maritime domain awareness. NOAA Corps pilots continued to support homeland security efforts by providing mapping datasets of 17 major cities to the Army Joint Precision Strike Demonstration Program Office and the National Geospatial-Intelligence Agency. This relationship with the U.S. Army allows NOAA access to its light-detection and ranging (LIDAR) systems and meets the need for a continental U.S. response capability within 24 hours of an event (which did not exist before September 11, 2001). NOAA Corps pilots support the U.S. Army by collecting LIDAR data, which will be used to create a precision, three-dimensional model for security planning and response purposes.

In March 2004, NOAA celebrated the "keel laying" of the second new fisheries survey vessel, HENRY B. BIGELOW. *A contest-winning team of students from Winnacunnet High School in New Hampshire named the ship after the renowned oceanographer Dr. Henry Bryant Bigelow.*

Ship Construction Program Records Major Milestones

Construction was completed late this year on *OSCAR DYSON*, the first of four new fisheries survey vessels. The ship is undergoing sea trials and outfitting, and will begin operations in Alaska in 2005. Named after the pioneer of Alaska's groundfish industry, *OSCAR DYSON* will focus much of its research on Alaskan pollock, one of the Nation's most profitable commercial fisheries.

In March 2004, NOAA celebrated the "keel laying" of the second new fisheries survey vessel, *HENRY B. BIGELOW*. A contest-winning team of students from Winnacunnet High School in New Hampshire named the ship after Dr. Henry Bryant Bigelow, an oceanographer renowned for his work at Harvard, his founding of Woods Hole Oceanographic Institution, and his studies of the Gulf of Maine, in which he developed the interdisciplinary, ecosystem-based approach that characterizes modern oceanography.

During the active 2004 Atlantic hurricane season, NOAA aircraft flew 65 missions in support of hurricane surveillance, reconnaissance, and research. Photo: NOAA

NOAA Ship FAIRWEATHER *crew member David Gray Eagle raises the U.S. flag during the ship's reactivation ceremony in Ketchikan, Alaska.* Photo: Hall Anderson, Ketchikan Daily News

NOAA Ship HI'IALAKAI *was commissioned in September after undergoing conversion from a former U.S. Navy T-AGOS vessel. U.S. Senator Daniel K. Inouye's support was instrumental in obtaining funding for the ship, which primarily conducts coral reef studies in the Northwest Hawaiian Islands.* Photo: Michael May Productions

Finally, an option for a contract design for a new SWATH (small waterplane area twin-hull) vessel was awarded. When completed, the SWATH will be an integrated ocean mapping vessel and will replace the NOAA ship *RUDE*.

NOAA Platforms and Charters Advance Data Collection

NMAO employs a mix of NOAA platforms and charters to fulfill NOAA's data collection needs. The data support such varied missions as climate change research, nautical charting, flood forecasting, fisheries management, and ocean exploration. During FY 2004, NOAA aircraft logged more than 2,850 flights hours, and NOAA ships recorded 3,360 operating days in support of NOAA's programs. NMAO outsourced 2,975 flight hours and 2,578 ship-operating days to meet additional program needs.

NOAA Acquires Turbo Commander Aircraft

In FY 2004, NMAO's Aircraft Operations Center acquired a Turbo Commander aircraft for $900,000 from the Justice Department's Drug Enforcement Administration. The aircraft will become operational in FY 2005 after undergoing an overhaul for avionics, and will replace an aging Turbo Commander after calibration studies are completed. The NOAA Turbo Commander conducts high-mountain snow surveys in support of the National Weather Service's National Operational Hydrologic Remote-Sensing Center in Chanhassen, Minnesota. The data collected by the aircraft are used by NOAA to forecast spring snow melt, river flooding, and water management needs.

Ship Modernization Moves Forward

Modernization of NOAA's ships moved significantly forward during FY 2004. Two former Navy T-AGOS ships were transferred to NOAA. After conversion for research, the USNS *ASSERTIVE* is planned to replace NOAA's 38-year-old *DAVID STARR JORDAN*, and the USNS *CAPABLE* will be the first NOAA ship dedicated solely to ocean exploration. The NOAA ship *FAIRWEATHER*, which had been inactive since 1988, was reactivated after a complete refurbishment and began survey operations in Alaska in September 2004. Conversion was completed on another former Navy T-AGOS ship (USNS *VINDICATOR*), which was commissioned the NOAA ship *HI'IALAKAI* before beginning operations as a mapping and coastal

PRODUCTS AND SERVICES

Outsourcing Support

NMAO provides guidance and staff support to NOAA programs interested in obtaining chartered ships and aircraft. NMAO recommends chartering options to NOAA programs and ensures the platforms are safe and outfitted to meet program requirements.

Data Collection

NOAA ships and aircraft have sophisticated data collection capabilities, such as Doppler radar on the *RONALD H. BROWN* and WP-3D Orion hurricane research aircraft, as well as the Stepped Frequency Microwave Radiometer on the P-3s. Most ships are equipped with an NMAO-developed Scientific Computer System, which integrates data from shipboard and deployed sensors into one central system, enabling scientists to make research decisions based on real-time data access and visualization. The Fisheries Scientific Computer System addresses the specific needs of fisheries data collection. Additionally, NMAO has developed capabilities that enable ships at sea to connect to the Internet on a limited basis to transmit research data, real-time images of ship personnel and scientists at work, and other valuable products and services.

NOAA Diving Program

The NOAA Diving Program oversees and manages NOAA diving personnel, equipment, and activities to ensure that all diving operations are performed safely and efficiently. The program provides beginner and specialty dive training to NOAA employees and outside agencies, including the Federal Bureau of Investigation, the U.S. Environmental Protection Agency, the U.S. Secret Service, the U.S. Fish and Wildlife Service, and local law enforcement.

oceanography vessel in Hawaii. NOAA's active fleet is now up to 17 ships (from 15), and its average age has been reduced from 33 to 28 years.

Teacher at Sea Program Goes Skyward

During FY 2004, 21 teachers from around the country participated in the NOAA Teacher at Sea program. The program also established the NOAA Teacher at Sea (TAS) Association and began to reconnect all of the previous TAS participants. As of September 2004, 100 teachers have enrolled in TAS, and several have participated in educational activities as NOAA TAS representatives at the National Science Teachers Association Conference, the NOAA Summer Camp, and other science teacher association conferences.

Also in FY 2004, NMAO instituted an offshoot of the TAS program called NOAA Teacher in the Air. Opportunities to fly on NOAA aircraft were first offered to NOAA TAS alumni; five teachers participated in the new program.

FUTURE OUTLOOK

As emerging mission requirements such as homeland security, ocean exploration, and habitat mapping place additional demand for ship and aircraft data acquisition in the future, NMAO will face the challenges of providing multi-mission capable platforms, up-to-date technology, and highly skilled personnel to support NOAA's four mission goals. NMAO will continue to seek a proper mix of in-house and contracted work to meet these needs, while working to improve the efficiency of existing NOAA platforms, modernize or replace aging platforms with platforms that have the capabilities to serve more than one Line Office, and recruit and retain a technically competent workforce.

NOAA Teacher in the Air Dan VanRavenswaay checks out the radar screen in the Gulfstream-IV with the help of Flight Director Paul Flaherty. The G-IV was flying a Pacific winter storms mission out of its temporary base in Honolulu.
Photo: NOAA Library

NOAA Commissioned Officer Corps

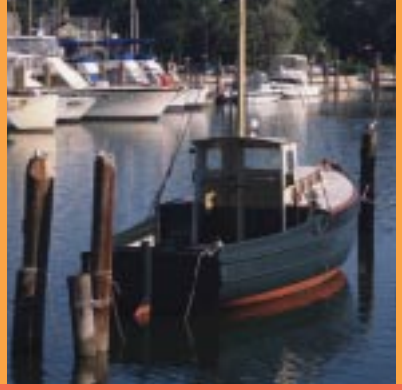
The NOAA Commissioned Officer Corps operates and manages NOAA ships and aircraft, and brings its operational expertise and knowledge to land-based NOAA programs through rotational assignments. Officers work under a personnel system similar to that of the U.S. armed forces, giving them the flexibility to move rapidly into disaster-response situations, such as flying remote-sensing missions over the collapsed World Trade Center and Pentagon after September 11, 2001. NOAA Corps officers, with their flexibility and cross-cutting research, operational, and management skills, are a great asset across all NOAA Line Offices as the agency strives to achieve its mission goals.

NOAA Teacher at Sea and Teacher in the Air Programs

Now in its 14th year, the NOAA Teacher at Sea Program has enabled more than 400 educators to gain hands-on NOAA research experience at sea. Each year, approximately 30 kindergarten- through college-level educators spend time aboard NOAA hydrographic, oceanographic, and fisheries survey and research vessels.

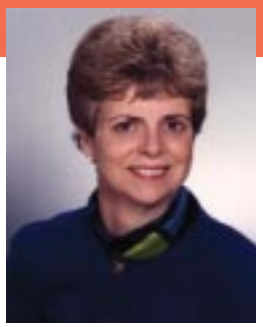
Teachers become a part of the NOAA research team and crew by living and working side-by-side with the scientists. This unique opportunity provides the teachers with a new understanding of NOAA science and shipboard life that enriches their curricula and lives. While onboard, teachers write daily logs, take photos, and interview scientists and crew. Some teachers use the Internet to communicate their experiences to students back home.

NOAA Teacher at Sea's success has led to the creation of an offshoot–NOAA Teacher in the Air–where teachers fly with NOAA on airborne missions, experiencing the same unique opportunities as their sea-going brethren.



Office of Program Planning and Integration

Guiding NOAA Strategically



Mary Glackin
Assistant Administrator

NOAA intends to meet societal needs spanning from short-term weather warnings to fishery population assessments to decadal climate prediction. To accomplish this objective, NOAA must actively engage with stakeholders to formulate strategic goals, link goals to specific program activities and objectives, and ensure that all decisions from the employee level to corporate decisions are driven by strategic vision. NOAA's Office of Program Planning and Integration (PPI) was created to lead NOAA in these important endeavors.

PPI is the product of one of the most important and creative recommendations of the June 2002 NOAA Program Review. The Program Review task force proposed an organizational structure and management process that modifies NOAA headquarters, while improving NOAA's decision-making processes. Specifically targeted are processes that are most necessary to support the Budget and Performance Integration Initiative of the President's Management Agenda.

The application of matrix management to NOAA's organization and programs is the foundation for the structural changes in NOAA that have been initiated in the past several months. It is also the driver for fundamental program and project management changes that reflect the transition of NOAA to a more corporate and integrated organization.

PPI works to ensure (1) NOAA's plans, investments, and actions are guided by a strategic plan responsive to societal needs; (2) NOAA's investments are based on sound socioeconomic policy; (3) NOAA's actions comply with the National Environmental Policy Act (NEPA); and (4) NOAA has effective programs that integrate talent, resources, and capabilities from across the agency.

ACCOMPLISHMENTS

NOAA Strategic Plan Updated

In FY 2004, PPI hosted one national and two regional stakeholder meetings to promote a dialogue on user needs. After extensive external review, PPI updated the NOAA Strategic Plan (September 2004), with a vision of: "An informed society that uses a comprehensive understanding of the role of the oceans, coasts, and atmosphere in the global ecosystem to make the best social and economic decisions." This plan retained the four mission goals from the FY 2003 version, and added a fifth goal to provide critical support for NOAA's mission.

Annual Guidance Memorandum Published

PPI prepared the FY 2007 Annual Guidance Memorandum (AGM), with input from a wide variety of internal and external stakeholders. The AGM sets NOAA's priorities for the FY 2007 cycle. These future directions are highlighted as: Integrate Global Observations; Advance NOAA's

Modeling Capability; Provide Leadership for the Oceans; Increase Climate Information, Services, and Products; Provide Critical Information for Water Resources; Support the U.S. Transportation Systems; Enhance Environmental Literacy; and Deliver Effective, Efficient Decision-Support Information.

NEPA Compliance Efforts Result in Financial Assistance

PPI led NOAA's efforts to comply fully with NEPA for financial assistance awards, with staff reviewing more than 300 NEPA categorical exclusion memos submitted to PPI. In addition, PPI developed guidance documents and provided training sessions to improve awareness of NEPA and ensure compliance within NOAA. These NEPA tools for NOAA financial assistance awards, as well as a Web-casted and -captioned training session are provided on PPI's NEPA Web site at http://www.nepa.noaa.gov/ to ensure availability to all NOAA personnel.

As an example of the products of NEPA reviews, a crumbling culvert in Anchorage, Alaska, will be replaced with a small bridge crossing. Upon completion of the NOAA NEPA Environmental Assessment, the sewage and jet fuel lines were flushed and capped, and then rerouted underneath the creek bed. This improvement removed a serious threat to salmon habitat as well as to beluga whales, which migrate in and out of the lower creek during high tide.

PPI Builds NOAA-wide Socioeconomic Capability

PPI's socioeconomic efforts concentrated on building a NOAA-wide economic and social science capability to provide timely information and cost, benefit, impact, and investment analysis to support the decision-making process. These efforts included workshops on the uses and benefits of economics and social science for mid- and senior-level NOAA management and staff across the agency; assessment of the transportation, employment, and energy impacts of Hurricane Isabel on the metropolitan Washington area; quantification of nearly $160 million in annual benefits of National Weather Service temperature forecasts in the electricity generation sector; and estimates of potential annual benefits of over $700 million from an integrated coastal ocean observing system.

Shoreline restoration of Ship Creek in Anchorage, Alaska.

In FY 2004, PPI hosted one national and two regional stakeholder meetings to promote a dialogue on user needs.

As a result of collaboration across Line Offices, the NOAA Coral Reef Conservation Program successfully launched a new Web site and public newsletter in FY 2004.

Matrix Management Strengthened

Matrix programs matured in FY 2004, their first full year of operation. PPI continued to strengthen matrix management as a key component in NOAA's transition to a more corporate and integrated organization. For example:

- As a result of collaboration across Line Offices, the NOAA Coral Reef Conservation Program successfully launched a new Web site and public newsletter in FY 2004. These tools allow NOAA to send program messages with one consistent, corporate voice, as well as provide our constituents with a single point of contact for inquiries.
- The Habitat Matrix Program has restored over 10,000 acres of coastal, marine or Great Lakes habitat and has made accessible approximately 600 stream miles for ocean, coastal, and Great Lakes resources within its first two years of developing a matrix structure.
- The Climate Program successfully integrated its numerous elements into a unified program structure with effective planning and program development, and established an independent review panel.
- PPI staffed and completed training for 14 matrix programs, and guided and reviewed Annual Operating Plans for the matrix programs.

FUTURE OUTLOOK

To meet the demands of society, NOAA must provide increasingly accurate and reliable environmental and ecological information and services. Delivering these services and providing stewardship for the Nation's coastal and marine resources is increasingly challenging, considering the scientific, social, and economic interactions from local to global scales. NOAA will work closely with stakeholders, and domestic and international partners at every level, to bring all the needed talent, resources, and capabilities together in a unified manner. PPI will facilitate these efforts by:

- continuing to foster strategic management process among Line and Staff Offices, Goal Teams, Programs, and Councils;
- strengthening planning activities with more active participation of employees, stakeholders, and partners;
- building decision support systems based on strategic plan goals and outcomes; and
- educating managers and employees on program and performance management, the National Environmental Policy Act, and the uses and benefits of socioeconomic analysis.

The Habitat Matrix Program has restored over 10,000 acres of coastal, marine or Great Lakes habitat and has made accessible approximately 600 stream miles for ocean, coastal, and Great Lakes resources within its first two years of developing a matrix structure.

PRODUCTS AND SERVICES

Strategic Planning

PPI leads the annual planning cycle as part of NOAA's Planning, Programming, Budgeting and Execution System. Driven by external and internal stakeholder input on needs and opportunities, this activity is supported by a comprehensive assessment of performance of current programs and prioritization of needed enhancements. The planning phase culminates each year with an updated five-year Strategic Plan and an Annual Guidance Memorandum that sets priorities for the programming and budgeting cycle.

PPI assists the Line and Staff Offices as they develop their respective Strategic Plans and analyzes NOAA's short- and long-term strategic issues using internal and external planning sessions as needed. A major focus of the SPO is developing and implementing a performance measurement system. SPO works with all organizations within NOAA to develop effective measures that tie to the Strategic Plan and ensures that monthly, quarterly, and annual reviews incorporate effective measures.

Socioeconomic Analysis

While NOAA is an agency focused on the physical and biological sciences of the Earth, to fulfill its mission the agency must also engage in the social sciences, including economics. NOAA must qualify and, where possible, quantify the costs and benefits of programs–not only to demonstrate value to those who contribute to and benefit from them, but also to provide the information necessary for NOAA to prioritize resources. Effectively incorporating sound socio-economic analysis is thus an increasingly important component of NOAA's success in achieving its national goals. In response to the Government Performance and Results Act, Executive Orders, and Office of Management and Budget Circulars on Cost-Benefit Analysis, PPI has taken the lead in this initiative. Through the NOAA Chief Economist, PPI conducts economic and social analysis and provides policy formulation, direction, and guidance for socio-economic analysis throughout the agency.

National Environmental Policy Act Responsibilities

Successfully meeting the requirements of the National Environmental Policy Act (NEPA) is an essential element of achieving program and NOAA-wide outcomes. The NOAA NEPA Coordinator in PPI ensures NEPA compliance in NOAA by reviewing and clearing all NEPA documents and other elements of NEPA compliance in NOAA, and by developing and training NOAA and Department of Commerce staff on national NEPA policy and guidance. The office also provides a liaison to the U.S. Environmental Protection Agency and the White House Council on Environmental Quality.

Matrix Management

Implementation of NOAA's Strategic Plan requires the effective integration of talent, resources, and capabilities from across NOAA. Matrix management is a major way NOAA achieves this integration. PPI is the focus for matrix management within NOAA, serving as one of the two supervisors for the matrix programs and acting as a program advocate. This role allows NOAA leadership and other constituents to have one point of contact for matrix management information and resources. In FY 2004, 14 of NOAA's programs were matrix managed: Habitat Restoration, Corals, Protected Areas, Invasive Species, Undersea Research and Exploration, Aquaculture, Ecosystem Research, Climate, Space Weather, Air Quality, Environmental Modeling, Weather Water Science and Technology Infusion Program, Emergency Response, and Homeland Security.

Office of International Affairs

Building Global Alliances

William J. Brennan, Ph.D.
Deputy Assistant Secretary for International Affairs

International affairs is one of NOAA's core capabilities, essential to the support of NOAA's overarching mission goals. For this reason, International Cooperation and Collaboration was designated in NOAA's Strategic Plan as one of the agency's six crosscutting priorities for the 21st century.

To advance NOAA's mission, the Office of International Affairs (OIA) provides policy advice and support with respect to negotiations, partnerships, and other NOAA international interests and activities. Over the past year, Vice Admiral Lautenbacher has met with leaders from government, industry, and academia to provide input into the international effort to develop a Global Earth Observation System, improve climate models, and conserve coral reefs. NOAA is dedicated to enhancing economic security and national safety through the predictions and research of weather- and climate-related events and providing environmental stewardship of our Nation's coastal and marine resources.

To enhance NOAA's international capabilities, an International Affairs Council has been established that is NOAA's focal point for international policy, activities, and important crosscutting topical areas. Through this Council, NOAA's international activities are managed using matrix management principles to ensure coordination, cooperation, and communication on international activities, and to enhance the visibility of NOAA's international activities and accomplishments.

ACCOMPLISHMENTS

U.S. Coral Reef Task Force Meets on Saipan and Guam

NOAA Deputy Assistant Secretary for Oceans and Atmosphere Timothy Keeney co-chaired public meetings of the U.S. Coral Reef Task Force on the islands of Saipan and Guam on October 3–6, 2003. During the meetings, the task force discussed the implementation of the U.S. National Action Plan to Conserve Coral Reefs, recognized significant contributions to coral reef conservation, identified efforts to increase local and regional management capacity through three-year local action strategies, and took public comments. Established by Executive Order 13089, the task force is charged with coordinating U.S. efforts to conserve and manage coral reef ecosystems. It consists of the heads of 11 federal agencies, the governors of seven states and territories, and the leaders of the Freely Associated States, and is co-chaired by NOAA and the U.S. Department of the Interior.

NOAA and EUMETSAT Convene Annual Bilateral Meeting

On October 15, Gregory Withee, Assistant Administrator for NOAA's Satellite and Information Service, led a NOAA delegation to the headquarters of the European Organization

for the Exploration of Meteorological Satellites (EUMETSAT) in Darmstadt, Germany. NOAA and EUMETSAT convened their annual bilateral meeting to exchange information on the status of their programs and also convened a High-Level Working Group meeting to discuss issues that affect cooperation. Among the issues discussed were the NOAA-N' satellite accident and a follow-up from Vice Admiral Lautenbacher's June trip to EUMETSAT. While in Germany, Withee led a bilateral meeting on October 17 with the German Space Agency in Oberpfaffenhoffen.

31st Meeting of CGMS Held in Switzerland

On November 10–14, a U.S. delegation composed primarily of NOAA representatives attended the 3lst meeting of the Coordination Group for Meteorological Satellites (CGMS) in Ascona, Switzerland. CGMS is an informal international group that gathers annually to coordinate the global system of operational meteorological satellites, a series of independent national or regional systems. Membership of CGMS is restricted to the operators of meteorological satellites (China, EUMETSAT (for Europe), India, Japan, Russia, and the United States) and to the World Meteorological Organization in its capacity as a major user organization.

Assistant Administrator Gregory Withee chaired and moderated a panel of Earth observation agency heads at the International Symposium on Remote Sensing of the Environment in Honolulu, Hawaii.

NOAA Chairs International Remote-Sensing Symposium

Assistant Administrator Gregory Withee chaired and moderated a panel of Earth observation agency heads at the International Symposium on Remote Sensing of the Environment (ISRSE) in Honolulu, Hawaii, on November 14. NOAA is a member of the ISRSE Executive Committee. Held every two years, the symposium is one of the premier Earth observation conferences, attracting hundreds of participants from countries around the world.

ICCAT Adopts Several New Measures

On November 15–24, 2003, Assistant Administrator for Fisheries and U.S. Commissioner to the International Commission for the Conservation of Atlantic Tunas (ICCAT) William Hogarth led a U.S. delegation to the ICCAT annual meeting in Dublin, Ireland. The 37 contracting parties to ICCAT, including the United States, met to discuss possible ways to increase compliance; expand measures that address illegal, unregulated and unreported fishing (including trade-restrictive measures); and improve data collection, reporting, monitoring, and control.

In addition to holding a special workshop on the integrated management of bluefin tuna, the Commission adopted new measures for managing bigeye and albacore tunas. In continuing efforts to protect small fish, the Commission adopted a ban on the use of driftnets for fishing on large pelagics in the Mediterranean and agreed to take the necessary steps to reduce mortality of juvenile swordfish. ICCAT also adopted a U.S. proposal on data collection and quality assurance that establishes a fund, with a startup contribution from the United States, for training in data collection and support for participation in ICCAT's scientific meetings.

NOAA Deputy Assistant Secretary for Oceans and Atmosphere Timothy Keeney co-chaired public meetings of the U.S. Coral Reef Task Force on October 3–6, 2003.

From left, Rick Spinrad, Vice Admiral Lautenbacher, Scott Rayder, and Bill Zahner attended the Oceanology 2004 Conference held in London, England. Photo: Scott Smullen, NOAA Public Affairs

NOAA Hosts 17th CEOS) Plenary and IGOS Partners Meeting

On November 18, NOAA hosted the 17th Plenary Session for CEOS, a meeting of the Integrated Global Observing Strategy (IGOS) Partnership, and associated events in Colorado Springs, Colorado. During 2003, Gregory Withee, Assistant Administrator for NOAA's Satellite and Information Service, chaired CEOS. More than 100 participants attended, representing 23 space agencies and 9 international organizations.

NOAA Co-sponsors Climate Prediction Workshop

On April 19–22, 2004, NOAA Research co-sponsored a Climate Prediction Workshop with the International Climate Variability and Predictability World Climate Research Programme, the Coupled Ocean Atmospheric Processes and European Climate Programme, and the Center for Global Atmospheric Modeling. Held at the University of Reading in Berkshire, England, the workshop aimed to assess the state of knowledge concerning the predictability of climate in the Atlantic Sector, with particular emphasis on the role of the Atlantic Ocean; to improve communication between the operational prediction centers and identify gaps in knowledge and in observing systems required for the further development of systems for forecasting Atlantic Sector climate; and to recommend priorities for future research, observational programs, and development of prediction systems.

Second Earth Observation Summit Held in Tokyo

Vice Admiral Lautenbacher participated in the second Earth Observation Summit on April 25 in Tokyo, Japan. Lautenbacher represented the United States, along with U.S. Environmental Protection Agency Administrator Michael Leavitt and John Marburger, Science Advisor to the President. The summit was a continuation of the work accomplished during the first Earth Observation Summit, co-hosted by Secretary Evans in July 2003, toward developing a comprehensive, coordinated, and sustained Earth observation system.

NCDC and MSC Host Bilateral Meeting in Toronto

On August 31 and September 1, NOAA's National Climatic Data Center (NCDC) and Canada's Meteorological Services Canada (MSC) hosted a bilateral meeting in Toronto regarding their collaboration in the climate monitoring area. Part of a series of meetings, this event coordinated the two countries' climate and weather monitoring activities. At the meeting NOAA and MSC signed a Memorandum of Understanding (MOU) on Cooperation in Environmental Data Acquisition and Utilization. The third annex of the MOU, entitled the North American Strategic Plan for Monitoring Climate and Weather Extremes for Improved Decision Making, incorporated several projects, including the North American Drought Monitor; a joint project between Canada, the United States, and Mexico; and the co-placement of U.S. and Canadian climate measurement stations.

NCDC Attends Meeting in Beijing

NOAA's National Geophysical Data Center attended the 18th meeting of the Committee on Earth Observation Satellites/Working Group on Information System and Services (CEOS/WGISS) in Beijing, China. Held on September 6–10, the meeting was sponsored by China's National Remote Sensing Center. CEOS is an international collaborative mechanism charged with coordinating international civil spaceborne missions designed to observe and study Earth. Comprising 23 mem-

bers and 21 associates, CEOS is recognized as the major international forum for the coordination of Earth observation satellite programs and for the interaction of these programs with users of satellite data worldwide.

NOAA Assists Romania's Weather Service

Assistant Administrator for the National Weather Service (NWS) D.L. Johnson attended a celebration on September 20 marking the 120th anniversary of the founding of Romania's weather forecast services with the President of Romania. During the celebration, Johnson signed a Memorandum of Agreement between the Ministry of Water and Environment Protection and the NWS. As part of a project to modernize flood forecasting services and to mitigate flood losses, NWS assisted the Romania Weather Service in implementing the NWS River Forecast System throughout the country

NOAA Sponsors Forum on Earth Observations

Secretary Evans addressed the NOAA Forum on Earth Observations on September 22 in Washington, D.C. The forum convened leaders from government, industry, and academia to provide input into the international effort to develop a Global Earth Observation System of Systems. Under Secretary Lautenbacher presented an overview of the recently released draft of the *Strategic Plan for the U.S. Integrated Earth Observation System*, which was developed by the Interagency Working Group on Earth Observations, composed of representatives from more than 15 U.S. government agencies.

NOAA Shares Spill Response Knowledge with Vietnamese Delegation

NOAA hosted a delegation from Vietnam on September 27 to share U.S. knowledge about responding to oil spills. The delegation included representatives from Vietnamese organizations dealing with emergency response, oil spills, environmental issues, natural resources, and the petroleum industry. This visit was part of a U.S. Agency for International Development program designed to increase Vietnam's capacity to prevent and respond to oil spills.

NOAA Conducts Largest Whale Study

NOAA Fisheries and the National Ocean Service conducted the largest North Pacific humpback whale study ever undertaken. Known as SPLASH (Structure of Populations, Level of Abundance and Status of Humpbacks), the study brought together hundreds of researchers from the United States, Japan, Russia, Mexico, Canada, Costa Rica, Panama, Nicaragua, Guatemala, and the Philippines in an effort to understand the population structure of humpback whales across the North Pacific and to assess the status, trends, and potential human impacts on humpback populations. Humpback whales were listed as an endangered species in 1973. Current assessments indicate the stock numbers around 7,000 animals—less than half of the pre-whaling population of approximately 15,000 animals.

NOAA Hosts Climate Change Workshop

On September 16–17, the Science Steering Committee of the U.S. Climate Variability and Predictability Program (U.S. CLIVAR) convened a special session sponsored by NOAA for CLIVAR's executive members in Woods Hole, Massachusetts. A research project under the international World Climate Research Program, CLIVAR is funded by NOAA, the National Aeronautics and Space Administration, and the National Science Foundation. CLIVAR conducts research aimed at improving climate models for predicting intraseasonal to decadal climate variability. These models are being used to generate climate scenarios for the 2007 Intergovernmental Panel on Climate Change Science Assessment Report. NOAA's CLIVAR funding is approximately $6 million a year.

NOAA Fisheries and the National Ocean Service conducted the largest North Pacific humpback whale study ever undertaken.

FINANCIAL OVERVIEW

Office of the Chief Financial Officer

Managing NOAA's Resources

Maureen E. Wylie
Chief Financial Officer

The Chief Financial Officer (CFO) serves as the principal financial manager for NOAA's appropriated resources. The CFO Act of 1990 requires the CFO's Office to provide the leadership necessary for NOAA to obtain a yearly-unqualified opinion in the audit of its consolidated financial statements. Under the direction of the CFO, the Budget and Finance Offices perform studies using methods and procedures analysis, and systems and organizational analysis support senior management in making executive decisions to ensure operational efficiencies within NOAA.

The Budget Office coordinates the preparation of NOAA budget submissions to the Department of Commerce, the Office of Management and Budget (OMB), and Congress, including data on budget authority, obligations, outlays, permanent positions, and full-time equivalent employment. It also provides for the proper allocation and control of the execution of all budgetary resources, as required under the Congressional Budget and Impoundment Act of 1974 and related statutes, and as specified by OMB. The Budget Office also maintains a staff that focuses on outreach and communication, particularly with the staff of Congressional appropriations committees, as well as other Executive Branch agencies.

The Finance Office works to ensure that NOAA's consolidated financial statements and reports accurately reflect NOAA's fiduciary status at the end of the fiscal year, as required of all government agencies under the CFO Act. It operates NOAA's financial management system to ensure that NOAA's managers have access to timely financial data necessary to make informed programmatic decisions. The Finance Office is also responsible for ensuring that NOAA's bills are paid in a timely manner.

NOAA FY 2004 RESOURCE ALLOCATIONS

The 21st century poses complex challenges for NOAA. Every aspect of NOAA's mission—from managing coastal and marine resources to predicting changes in the Earth's environment—faces a new urgency, given intensifying national needs related to the economy, the environment, and public safety. As the new century unfolds, new priorities for NOAA action are emerging in the areas of ecosystem management, climate change, freshwater supply, and homeland security (Table 1).

TABLE 1
NOAA Resources by Mission Goals

Ecosystem Management	$1,459,959,000
Climate Change	$445,738,000
Weather and Water	$1,507,536,000
Commerce and Transportation	$329,474,000

NOAA's resources fund programs that increase our scientific understanding of the oceans and atmosphere, with the ultimate goal of sustaining America's environmental health and economic vitality. From weather forecasting to fisheries management, from safe navigation to coastal services, from remote sensing to climate research and ocean exploration, NOAA is at the forefront of many of this Nation's most critical issues (Table 2).

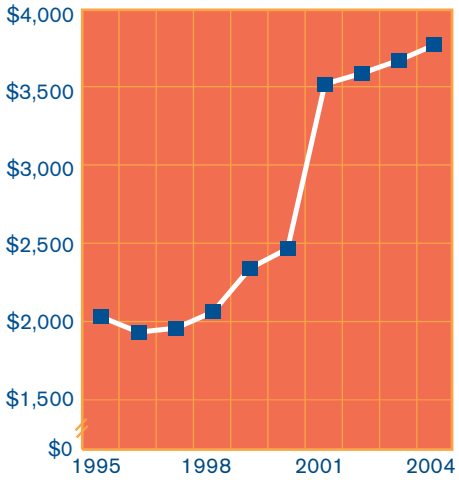
TABLE 2
NOAA Resources by Line Office

National Ocean Service	$602,433,000
National Marine Fisheries Service	$759,713,000
Office of Oceanic and Atmospheric Research	$414,584,000
National Weather Service	$824,874,000
National Environmental Satellite, Data and Information Service	$827,056,000
NOAA Marine and Aviation Operations	$154,368,000
Planning, Program and Integration	$1,979,000

NOAA's total budget appropriation was $3.7 billion for FY 2004. These funds were directed toward fulfilling NOAA's statutory and legal obligations, as well as Congressional responsibilities. They provided for equipment, direct labor, and other expenses that support NOAA's mission. Over the last 10 years, NOAA's appropriated funding level has grown by 84 percent (Figure 1).

NOAA's budget is composed of several appropriations and special fund accounts. NOAA's two main appropriations are Operations, Research and Facilities (ORF) and Procurement, Acquisition and Construction (PAC). The ORF account funds core NOAA operations, such as advanced, short-term forecast and warning services; management of fisheries and protected species; and responsibilities for sustaining the health of coastal ecosystems. NOAA's PAC account was created in FY 1999 in response to requirements of the Federal Acquisition Streamlining Act of 1996. This account captures funding for multi-year capital projects and seeks advanced appropriations for projects that are in the acquisition stage. NOAA's other accounts, aggregated in the Non-ORF Total Budget Authority, include the Damage Assessment and Restoration Revolving Fund, the Coastal Zone Management Fund, and various fisheries funds.

FIGURE 1
NOAA Budget Growth (in billions)



CONSOLIDATED FINANCIAL STATEMENT

Assets

The FY 2004 Consolidated Balance Sheet reflects total assets of $7.3 billion (Table 3) and primarily consists of: Fund Balance with Treasury; Accounts Receivable, Net; Loans Receivable and Related Foreclosed Property, Net; Inventory and Related Property; and General Property, Plant, and Equipment.

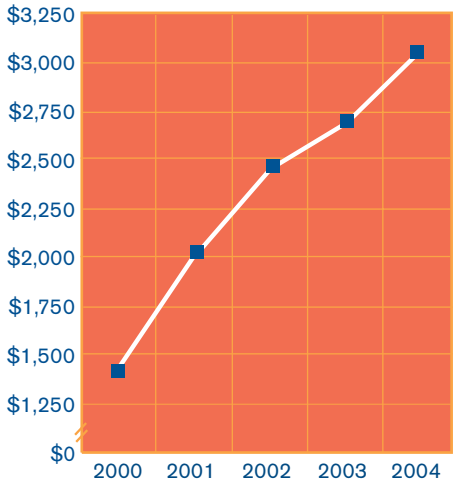
TABLE 3
Assets (in thousands)

	FY 2004	FY 2003
Intragovernmental Assets	**$3,144,690**	**$2,801,877**
Fund Balance with Treasury	3,036,863	2,716,116
Accounts Receivable, Net	71,090	57,504
Advances and Prepayments	36,737	28,257
Non-intragovernmental Assets	**$4,208,573**	**$4,182,445**
Cash and Other Monetary Assets	1,688	2,395
Accounts Receivable, Net	39,246	36,252
Loans Receivable and Related Foreclosed Property, Net	249,017	190,321
Inventory, Materials, and Supplies	72,642	75,246
General Property, Plant, and Equipment, Net	3,827,199	3,867,375
Advances and Prepayments	14,510	4,882
Other	4,271	5,974
TOTAL ASSETS	**$7,353,263**	**$6,984,322**

Fund Balance with Treasury

The Fund Balance with Treasury of $3.0 billion primarily consists of appropriated funds to pay current liabilities and finance authorized purchase commitments (Figure 2).

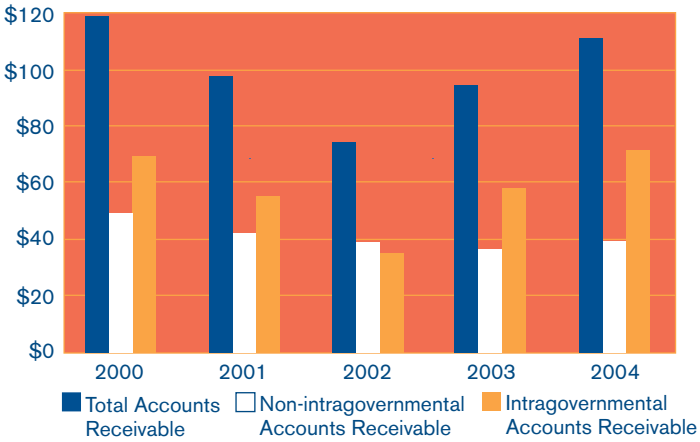
FIGURE 2
Fund Balance with Treasury (in millions)



Accounts Receivable, Net

Accounts Receivable, Net of $110.3 million consists of intragovernmental (Federal agency) accounts receivable of $71.1 million and non-intragovernmental accounts receivable of $39.2 million (Figure 3). Outstanding billed and unbilled reimbursable services provided to other Federal agencies comprise the majority of NOAA's accounts receivable. Accounts receivable are established to receive payments for direct and indirect costs of services provided to another Federal agency or to a non-intragovernmental entity.

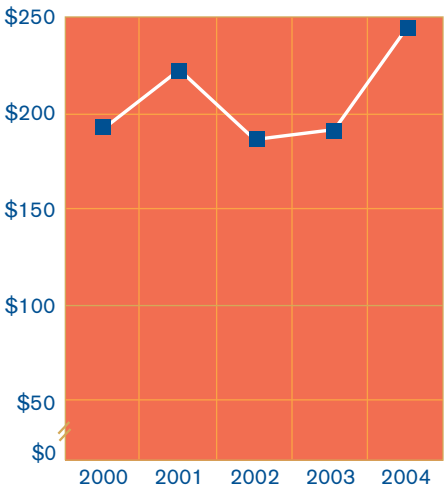
FIGURE 3
Accounts Receivable, Net (in millions)



Loans Receivable and Related Foreclosed Property, Net

Loans Receivable and Related Foreclosed Property, Net of $249.0 million consists of monies disbursed by the Fisheries Finance Program to private lenders for guaranteed loans in default, and monies disbursed as direct loans to finance various National Marine Fisheries Service loans totaling $11.4 million and $237.6 million, respectively (Figure 4).

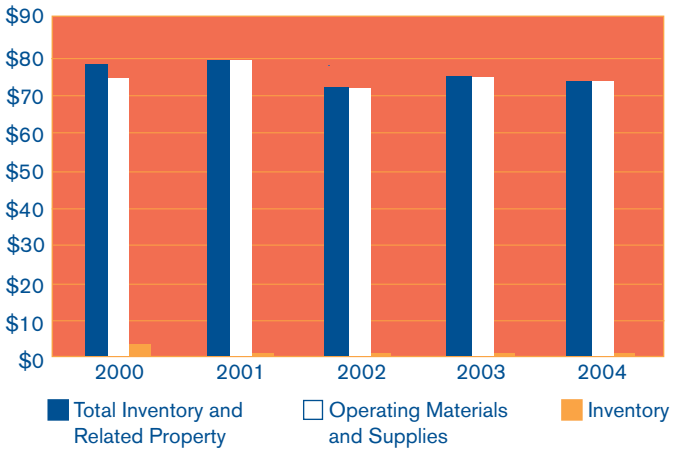
FIGURE 4
Loans Receivable and Related Foreclosed Property, Net (in millions)



Inventory and Related Property

Inventory and Related Property of $72.6 million consists solely of operating materials and supplies, which in turn consist of tangible personal property to be consumed in normal operations (Figure 5). The majority of operating materials and supplies are located at the National Logistics Support Center and are used mainly by the National Weather Service. NOAA's inventory, comprised primarily of maps and charts, was transferred to the Federal Aviation Administration during FY 2001.

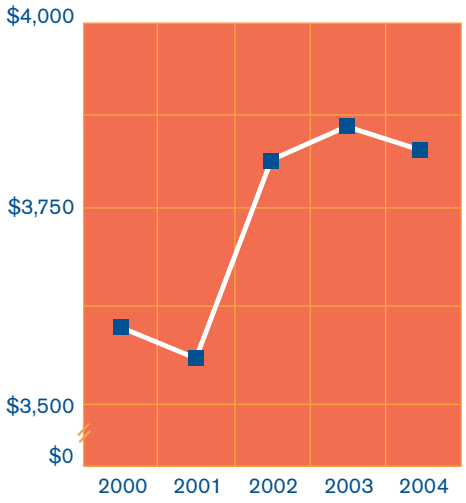
FIGURE 5
Inventory and Related Property (in millions)



General Property, Plant, and Equipment

General Property, Plant, and Equipment is stated at net book value of $3.8 billion (Figure 6). It consists mainly of construction work in progress, satellites and weather systems, structures and facilities, and other personal property with net book values of $2.5 billion, $0.8 billion, $0.2 billion, and $0.3 billion, respectively. Satellite and launch services are generally procured under long-term, multi-satellite contracts, which provide for payments by NOAA over the contract periods.

FIGURE 6
General Property, Plant, and Equipment (in millions)



Liabilities

The FY 2004 Consolidated Balance Sheet reflects NOAA liabilities totaling $1.2 billion (Table 4). The following significant liabilities represent monies owed for goods and services that have been received but for which payment has not yet been made.

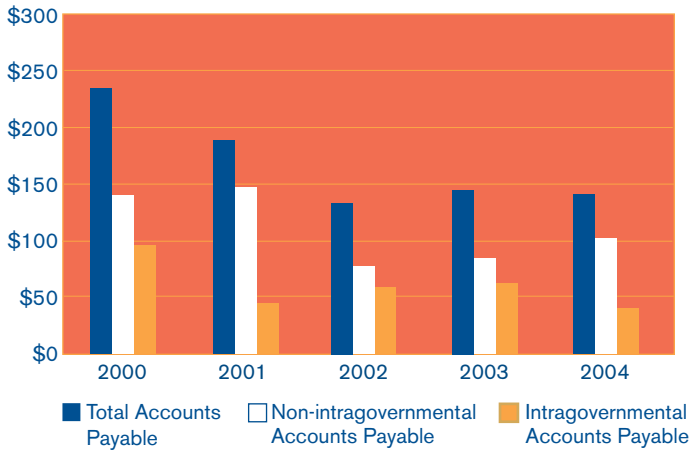
TABLE 4
Liabilities and Net Position (in thousands)

	FY 2004	FY 2003
Intragovernmental Liabilities	**366,081**	**$323,605**
Accounts Payable	40.091	62,696
Debt to Treasury	245,226	182,501
Resources Payable to Treasury	9,752	12,251
Unearned Revenue	52,007	47,442
Other	19,005	18,715
Non-intragovernmental Liabilities	**$824,361**	**$794,653**
Accounts Payable	102,923	84,936
Accrued Payroll and Annual Leave	119,258	107,137
Actuarial FECA Liability	59,133	53,631
NOAA Corps Pension	335,700	326,600
NOAA Corps Retirement Health Benefits	42,800	42,077
Accrued Grants	33,890	38,678
Environmental and Disposal Liabilities	41,998	49,161
Capital Leases	14,338	15,880
Unearned Revenue	47,600	31,745
Other Liabilities	**26,721**	**44,808**
TOTAL LIABILITIES	**$1,190,442**	**$1,118,258**
Net Position	**$6,162,821**	**$5,866,064**
Unexpended Appropriations	2,756,492	2,424,514
Cumulative Results of Operations	3,406,329	3,441,550
TOTAL LIABILITIES & NET POSITION	**$7,353,263**	**$6,984,322**

Accounts Payable

Accounts Payable of $143.0 million consists of $40.1 million of intragovernmental accounts payable and $102.9 million of non-intragovernmental accounts payable (Figure 7).

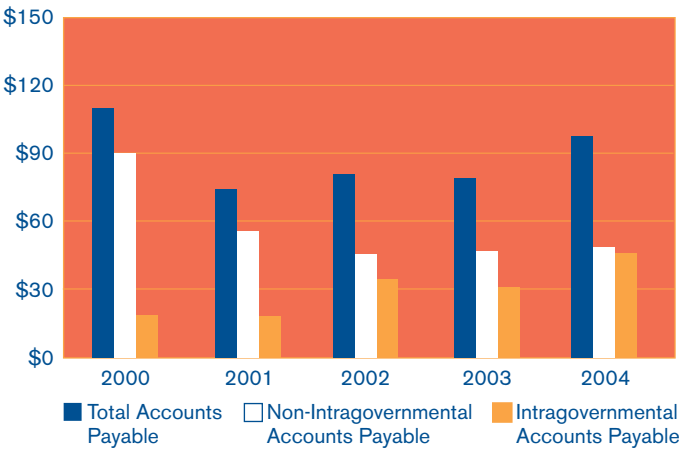
FIGURE 7
Accounts Payable (in millions)



Unearned Revenue

Unearned Revenue of $99.6 million consists of intragovernmental and non-intragovernmental unearned revenue of $52.0 million and $47.6 million, respectively (Figure 8). The majority of NOAA's unearned revenue consists of amounts advanced to NOAA by other Federal entities (such as the Departments of Defense and Transportation), and non-intragovernmental entities, for goods and services to be furnished.

FIGURE 8
Unearned Revenue (in millions)



Future Funding Requirements

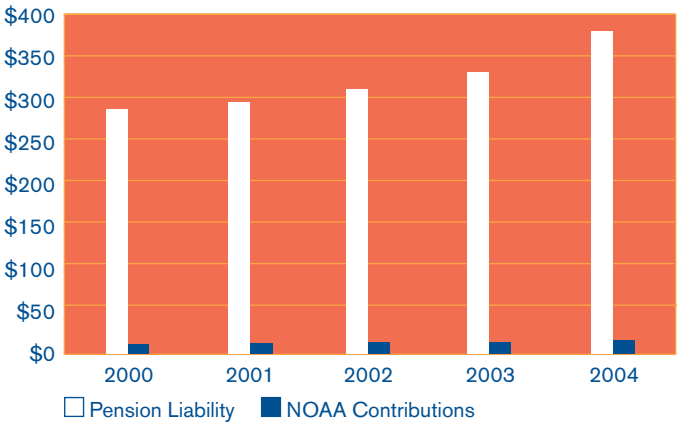
Future Funding Requirements of $609.1 million represent liabilities not funded by budgetary resources, including a NOAA Corps pension liability of $335.7 million, NOAA Corps retirement health benefits of $42.8 million, accrued leave balances of $87.5 million, Federal Employee Compensation Act actuarial and accrued liabilities of $70.8 million, environmental cleanup costs of $42.0 million, capital lease liabilities of $9.4 million, contingent liabilities of $18.6 million, and other liabilities of $2.3 million.

Liabilities not covered by budgetary resources result from the receipt of goods or services in the current or prior periods, or from the occurrence of eligible events in the current or prior periods, for which appropriations, revenues, or other financing sources of funds necessary to pay the liabilities have not been made available through Congressional appropriations or current NOAA earnings. As of September 30, 2004, the total amount of liabilities classified as unfunded exceeded the $358.5 million in available unobligated appropriations by $250.6 million. These liabilities are presented as unfunded, rather than allocating portions of each of them to appropriated funds.

NOAA Corps Pension Liabilities

NOAA Corps Pension Liabilities of $378.5 million, as mentioned above, represent non-intragovernmental liabilities not covered by budgetary resources relating to the NOAA Corps Retirement System (Figure 9). The NOAA Corps Retirement System is a noncontributory, defined-benefit plan covering all active-duty officers, retiree annuitants, and surviving families totaling 631 as of September 30, 2004. During FY 2004, NOAA contributed $18.6 million to the NOAA Corps Retirement System.

FIGURE 9
NOAA Corps Pension Liabilities (in millions)



Fluctuation Analysis

The following balance sheet fluctuations were noted between FY 2003 and FY 2004 financial statements:

Total Assets

NOAA's total assets increased by approximately $368.9 million from September 30, 2003, to September 30, 2004. The majority of the increase in total assets is attributable to increases in Fund Balance with Treasury and Loans Receivable and Related Foreclosed Property of $320.7 million and $58.7 million, respectively.

Total Liabilities

Overall, NOAA's total liabilities remained constant between September 30, 2003, and September 30, 2004.

Equity

NOAA's Net Position increased by approximately $296.8 million from FY 2003 to FY 2004. The $6.1 billion of net position consists of $2.7 billion of Unexpended Appropriations and $3.4 billion from Cumulative Results of Operations.

Appropriated Capital Used

The FY 2004 Statement of Changes in Net Position reports the beginning net position, the items that caused net position to change during the year ended, and the ending net position. The majority of the activity in this statement involves two components of net position—net cost of operations and appropriations used (revenues), totaling $3.6 billion and $3.4 billion, respectively.

Appropriated capital used represents revenue or a financing source to NOAA made available through Congressional appropriations. Appropriations are recognized as financing sources at the time the related expenses are incurred and the assets are consumed in operations (Figure 10).

Budgetary Resources

The FY 2004 Statement of Budgetary Resources details how budgetary resources were made available, as well as their status at the end of the period. NOAA received approximately 83 percent, or $3.8 billion, of its budgetary resources of $4.6 billion through appropriations (Figure 11). Of the $3.8 billion, NOAA's ORF appropriation received $2.7 billion. Other major sources of budgetary resources include unobligated balances carried over from FY 2003 and spending authority from offsetting collections, totaling $400.0 million and $284.1 million, respectively. Of the total budgetary resources of $4.6 billion, $4.2 billion was obligated during FY 2004.

FIGURE 10
Appropriated Capital Used (in millions)

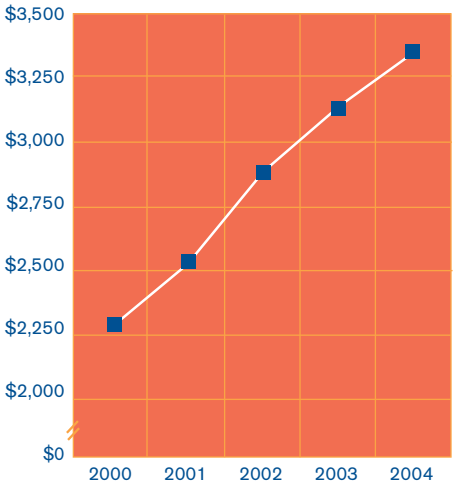
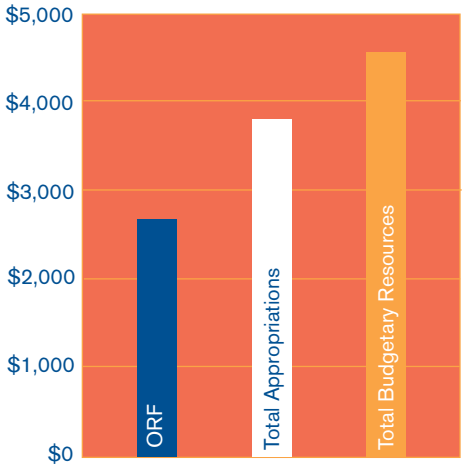


FIGURE 11
Budgetary Resources (in millions)



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UNITED STATES OF AMERICA