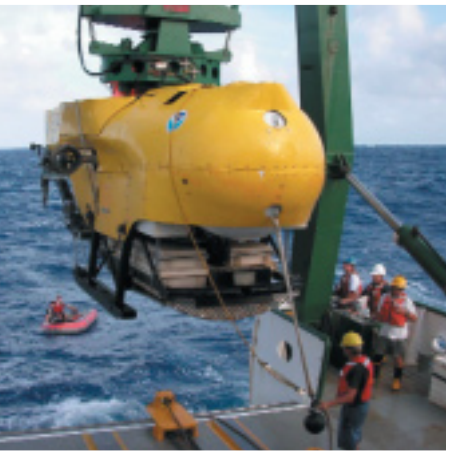
NOAA—Where Science Adds Value

NOAA BUSINESS REPORT 2005

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



NOAA—Where Science Adds Value

Understanding and Predicting Changes, Conserving and Sustaining Resources

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

The National Oceanic and Atmospheric Administration (NOAA) is a key component of the U.S. Department of Commerce. NOAA's work touches the daily lives of every person in the United States and in much of the world. From weather forecasts to fisheries management, from safe navigation to coastal services, from remote sensing to climate research and ocean exploration, NOAA's products and services contribute to the foundation of a healthy economy and affect approximately one-third of the Nation's gross domestic product. In addition to using science and technology to create jobs and improve economic prosperity, NOAA is directing resources toward disaster prevention, to improve understanding of disasters and minimize the loss of life and property from them. NOAA's Web site at www.noaa.gov provides a wealth of knowledge to schools and people across the Nation, as well as to industry and scientific enterprises.

MAJOR FY 2005 ACCOMPLISHMENTS

During FY 2005, NOAA continued its record of success toward providing more accurate predictions of severe weather, enhancing understanding of long-term climate and environmental trends, sustaining healthy coastal and marine habitats and ecosystems, and addressing safety and compliance issues. Major FY 2005 accomplishments included the following:

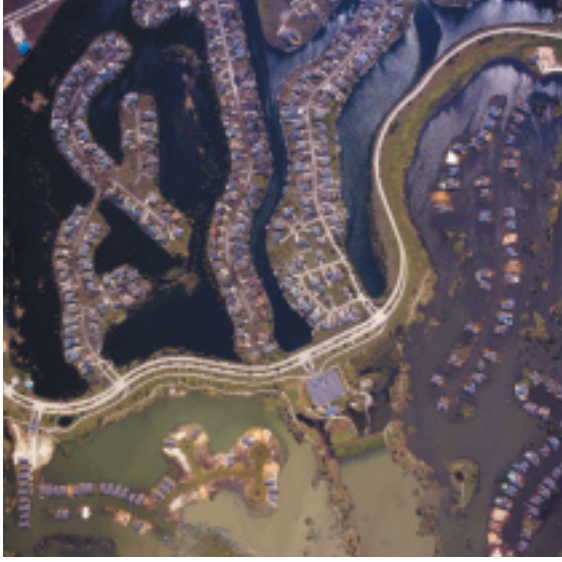
- NOAA-N, a polar-orbiting operational environmental satellite, was successfully launched from Vandenburg Air Force Base on May 20, 2005. The launch of this satellite will enable NOAA to continue to share satellite instrument data and products with our partners.
- Following Florida's hurricanes, Congressional approval of the FY 2005 Emergency Supplemental provided additional resources that allowed NOAA to launch seven new weather data buoy stations to expand marine observations.
- NOAA facilitated international progress on the Global Earth Observation System of Systems (GEOSS). The intergovernmental Group on Earth Observations (GEO) endorsed the 10-year implementation plan in February 2005 at the Third Global Earth Observation Summit.
- NOAA developed a plan to expand U.S. tsunami detection and warning capabilities as part of the GEOSS, the international effort to develop a comprehensive, sustained, and

integrated Earth observation system. The plan, which commits $37.5 million over the next two years, will enable enhanced monitoring, detection, warning, and communication designed to protect lives and property in the United States and a significant part of the world. The United States has been a leader in the GEOSS effort since 2003, when the G-8 called for establishing a global observation system. The GEO now has 60 participating nations, including India, Indonesia, and Thailand.

- One formerly overfished stock—Pacific whiting—was fully rebuilt. In addition, six stocks are no longer considered to be overfished (black sea bass (mid-Atlantic), lingcod, golden tilefish, king mackerel (Gulf group), Pacific Ocean perch, and Pacific whiting), and overfishing has been eliminated on three stocks (black sea bass (mid-Atlantic), Pacific whiting, and red drum).
- NOAA has received an "unqualified opinion" on its financial statements each year since 1998—a good indication of effective internal controls and accurate financial systems.

Reducing the Vulnerability of Coastal Communities

The 2005 Atlantic hurricane season was one of the busiest in recorded history. Hurricane Katrina was the costliest economic, environmental, and public health disaster on record in the Gulf Coast region. NOAA played integral roles in preparedness, response, and recovery efforts in the region. Activities included conducting aerial surveys over the affected areas, navigational surveys in hurricane-affected waterways, and ecological assessments of affected resources; helping officials identify evacuation routes; and maintaining valuable tidal information.



Hurricane Katrina was the costliest economic, environmental, and public health disaster on record in the Gulf Coast region.
Photo: National Geodetic Survey

NOAA's work to protect the public's safety is continuing long after the end of the hurricane season. Katrina won't be the last major hurricane to hit a vulnerable area, and New Orleans isn't the only location vulnerable to a large disaster from a land-falling hurricane. Houston/Galveston, Tampa Bay, southwest Florida, the Florida Keys, southeast Florida, New York City/Long Island, and New England are all especially vulnerable to a large disaster from a land-falling hurricane. Besides focusing on post-storm redevelopment strategies for communities hard-hit by Katrina and other storms, we are working with our partners to reduce the vulnerability of coastal communities to major storms by helping them manage and anticipate these extreme events.

It is critical that we work to protect and restore natural features along the Gulf and other coastal areas, such as dunes, wetlands, and other vegetated areas that offer protection against coastal flooding and erosion. And we will continue to improve our hurricane tracking, intensity, and storm surge forecasting capabilities, as well as provide technical tools and planning expertise to state and local governments.

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

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

NOAA HIGHLIGHTS


TSUNAMI

Management Improvements

Focusing on Strategic Priorities

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

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

Scott Rayder
Chief of Staff to NOAA Under Secretary of Commerce

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

As an agency with responsibilities for maintaining and improving the viability of marine and coastal ecosystems, for delivering valuable weather, climate, and water information and services, for understanding the science and consequences of climate change, and for supporting the global commerce and transportation upon which we all depend, NOAA must remain current and responsive in an ever-changing world.

The NOAA Strategic Plan clearly articulates our vision and path for the future. Every year we re-evaluate our progress and priorities, look for efficiencies, and take advantage of new opportunities to improve our information, products, and services. Strategic planning and management of NOAA's activities work best when those who benefit from these activities and those who provide NOAA products and services are able to contribute to the process. Only by involving stakeholders, employees, and partners can NOAA fulfill its vision and mission.

MAJOR ACCOMPLISHMENTS

NOAA Updates Strategic Outlook

Significant events of FY 2005—the extent and ferocity of the 2004 and 2005 hurricane seasons, the devastating Indian Ocean tsunami, and the prolonged drought in the western United States—all underscore the importance of NOAA's mission to the Nation and the world. To maximize societal benefits, NOAA must continuously calibrate its programmatic and managerial priorities, taking into account new and emerging events to determine where to direct additional resources. Updates to strengthen near-term priorities are reflected in the budget. Long-term updates and guidance are incorporated through issuance of the Annual Guidance Memorandum, which is available at www.ppi.noaa.gov. During FY 2005, NOAA

identified the following strategic priorities:

- *People and Infrastructure*—Focus on the operations and maintenance of NOAA vessels, critical enhancements to marine safety, and end-to-end resource management.
- *Integrated Global Observing System*—Build an integrated Global Earth Observation System of Systems (GEOSS) that includes observing platforms in space, the atmosphere, the oceans, and on land, as well as components for data management and calibration.
- *Ecosystem Approaches to Resource Management*—Expand assessments of fish stocks and protected species, restore vital fisheries habitats, reduce vulnerability to coastal hazards, improve management of watersheds and marine resource areas, expand research to include the development of aquaculture and ecological forecast modeling, and build local capacity to protect coral reefs.
- *Climate Services*—Continue to make observations of the carbon cycle, research the role of aerosols on global climate, and investigate how society can cope with drought conditions resulting from changes in climate.
- *Weather and Water Information*—Strengthen NOAA's ability to warn against extreme weather events by collecting more data with buoy systems, new aircraft instrumentation, and the NOAA Profiler Network; continue to distribute hydrometeorological information through the National Weather Service Telecommunications Gateway.
- *Commerce and Transportation*—Expand NOAA's ability to collect water vapor and oceanographic observations to improve the safety of aviation and marine navigation; achieve greater transportation efficiencies with electronic navigational charts and the VDatum geodesy tool.
- *Facilities Construction*—Modernize existing facilities; construct the Pacific Region Center in Honolulu and NOAA's Center for Weather and Climate Prediction in College Park, Maryland.

NOAA is working to restore vital fisheries habitats and to build local capacity to protect coral reefs.
Photo: NOAA Photo Library

NOAA Leads implementation of *U.S. Ocean Action Plan*

NOAA has been designated a lead agency in implementing the *U.S. Ocean Action Plan*, the Administration's response to the 2004 report of the U.S. Commission on Ocean Policy. The plan identifies steps to be undertaken to ensure continued conservation of coastal and marine habitats and living marine resources, and at the same time guarantee that the public can continue to derive benefits from those resources.

NOAA Guides Global Efforts to Integrate Earth Observations

In a major development at the third Earth Observation Summit

NOAA STRATEGIC GOALS

- 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.

NOAA researchers recover current meters and floats. NOAA scientists understand and describe how natural systems work together through investigation and interpretation of information.
Photo: NOAA Photo Library

NOAA's P-3 hurricane hunter gathers data in the eyewall of Hurricane Katrina. A strategic NOAA priority is to enhance the agency's ability to warn against extreme weather events by collecting more data with buoy systems and new aircraft instrumentation.
Photo: NOAA Photo Library

during FY 2005, nearly 60 countries and more than 40 international organizations agreed to a 10-year implementation plan for integrating Earth observations worldwide. As a key member of the U.S. Group on Earth Observations, NOAA has revised its FY 2005 Strategic Plan to reflect these and other drivers toward achieving this goal, while maintaining a commitment to continue to serve society with NOAA's long-standing products and services.

NOAA Publishes Short- and Long-Term Corporate Research Plans

To make the best decisions about managing and sustaining marine and coastal resources and protecting the public against extreme weather events, policymakers need a comprehensive understanding of the role of the oceans, coasts, and atmosphere in creating these events. Research provides the foundation for that understanding.

NOAA has completed its first corporate *Five-Year Research Plan* and *20-Year Research Vision*. Developed by the NOAA Research Council, a committee of senior scientists from across NOAA, these two planning documents will guide the direction of NOAA's long- and short-term research, and will ensure that research supports NOAA's mission goals. The plans address growing challenges, as well as the need to integrate NOAA's research across the agency.

The *Five-Year Research Plan* focuses on short-term outcomes, such as creating an Earth system model, developing the Global Earth Observation System of Systems, studying ocean phenomena, and improving climate predictions and projections. It supports the four mission goal areas identified in the NOAA Strategic Plan—Ecosystems, Climate, Weather and Water, and Commerce and Transportation—while underscoring the importance of research that cuts across traditional disciplinary boundaries.

The *20-Year Research Vision* anticipates NOAA's future research direction. By 2025, the world will depend on NOAA's reliable information products and services to make optimal decisions to respond rapidly to a range of key issues affecting societies and economies.

NOAA Finalizes Grants Online System

During FY 2005, the NOAA Grants Online system became operational. Grants Online is the premier Federal solution for managing and processing full life-cycle grants. In addition to requiring user authentication through user names and passwords, the system uses a combination of role-based

and office-based access. Grants Online allows flexibility for internal access—e.g., a Program Officer can view all requests for grant applications. Regarding external access, in FY 2006, the system will allow current grant recipients to view information about their grants; submit post-award action requests, progress reports, and financial reports; and correspond with NOAA program officers and grant specialists. NOAA staff generates funding notices, reviews grant applications, selects applications for awards, processes selected applications and awards, manages grants, and corresponds with grant recipients.

Business Process Reengineering Completed for Budget and Grants

The vision for an efficient and effective financial and administrative services program was the driving force behind the assembly of the Transition Management Team (TMT) in late FY 2004. NOAA charged the TMT with completing an assessment of how financial and administrative service programs are performed within NOAA's program offices.

There are four phases to the Business Process Reengineering (BPR) effort: tailored training, "As-Is" assessment of eight functional areas, design of "To-Be" processes, and implementation of BPR.

The BPR for the Budget and Grants functional areas is complete. Phase III activities for the workforce management functional area analyzed current business processes, created new business processes, and developed the implementation plan for BPR in the Budget formulation and execution processes and the Grants planning, management, and award processes. Other administrative areas will also be re-engineered. The timeline for these has yet to be determined.

As part of this assessment, the TMT has provided recommendations for moving forward in each selected process. These recommendations identify the degree and scope of change deemed necessary to improve the efficiency and effectiveness of NOAA's financial and administrative services. This effort requires the buy-in and support of NOAA management, Functional Managers, and Line Offices. NOAA management will determine the scope and breadth of change to be implemented in each of the selected processes. During FY 2005, NOAA adopted a functional management model to deliver administrative and financial services. This change will establish direct lines of accountability from headquarters business line managers to all NOAA financial and administrative staff located in the field. This action will improve consistency in decisions, optimize resource allocation NOAA-wide, and promote more effective customer service.

FUTURE OUTLOOK

On the front lines as always, NOAA will provide the public with easy-to-use, seamless, integrated information products and services that will revolutionize the way Americans lead their daily lives. NOAA will dramatically improve severe event warnings and air quality forecasts, and will offer increasingly confident decadal predictions of climate. Improvements will be made in the management of fisheries, estuaries, and protected resources based on ecosystem-level scientific information.

A strategic NOAA priority is to focus on the operations and maintenance of NOAA vessels, such as the FAIRWEATHER, *which was recently reactivated in Ketchikan, Alaska.*
Photo: NOAA Photo Library

Excellence in NOAA's Leadership

PRESIDENTIAL RANK AWARDS—2004

John L. Hayes, former Deputy Assistant Administrator for Ocean and Coastal Zone Management, National Ocean Service

Issac Held, Senior Scientist, Geophysical Fluid Dynamics Laboratory, Office of Oceanic and Atmospheric Research

Michael McPhaden, Senior Research Scientist, Office of Oceanic and Atmospheric Research

Alan Neuschatz, Associate Assistant Administrator for Management and Chief Financial Officer/Chief Administrative Officer, National Ocean Service

A.R. Ravishankara, Senior Scientist, Aeronomy Laboratory, Office of Oceanic and Atmospheric Research

Dusan Zrnic, Senior Scientist, National Severe Storms Laboratory, Office of Oceanic and Atmospheric Research

DEPARTMENT OF COMMERCE AWARDS

Gold and Silver Medals—2005

Six individuals, 11 groups, and 15 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 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 Medals—2005

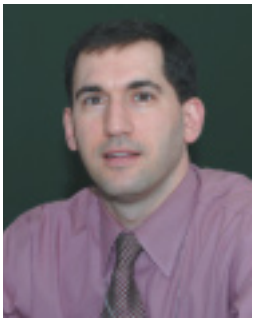
The Under Secretary presented the Department's Bronze Award to 17 individuals, 42 groups, and 22 NOAA organizations. This medal is the highest form of honorary recognition for superior service to NOAA.

NOAA AWARDS

Individuals and groups received the following NOAA awards during a ceremony held May 13, 2005:

- 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 achievements in advancing NOAA's goals.

Key Congressional Hearings Highlights



Eric Webster, Director
Office of Legislative Affairs

Tsunamis Warnings

Brig. Gen. David L. Johnson, Assistant Administrator for the National Weather Service, testified before the House Committee on Science that tsunamis are natural disasters that can form in all of the world's oceans and inland seas, and in any large body of water near seismic activity. Each region of the world appears to have its own cycle of frequency and pattern for generating tsunamis that range in size from small events presenting no hazards to large, highly destructive events. Eighty-five percent of tsunamis occur in the Pacific Ocean and its marginal seas. This is not surprising, as the Pacific Basin covers more than one-third of the Earth's surface and is surrounded by a series of mountain chains, deep-ocean trenches, and island arcs called the "ring of fire." The Bush Administration has a plan to upgrade the current U.S. tsunami warning system. NOAA's contribution to this plan includes upgrading and expanding the DART network to 32 new Pacific stations and 7 new Atlantic stations.

Successful Team Approach to Hurricane Season

In testimony before the House Committee on Resources, Subcommittee on Fisheries Conservation, Wildlife, and Oceans, Vice Admiral Lautenbacher noted that NOAA forecasters accurately predicted an above-average hurricane season. The record-setting four hurricanes that hit Florida in the summer and early fall of 2005 presented NOAA with the challenge of providing vital information about where the storms would strike and aiding recovery efforts once the storms were over. NOAA received praise from many directions, including letters addressed to Vice Admiral Lautenbacher from citizens affected by the storms. NOAA aircraft logged more than 800 flight hours, covered more than 100,000 nautical miles of track lines, and deployed more than 1,900 dropsondes into storms during the 2004 hurricane season. These instruments, which are dropped into storms from reconnaissance aircraft, are helping forecasters to make great strides in understanding and predicting hurricane behavior.

Reauthorization of the Magnuson–Stevens Fishery Conservation and Management Act

John H. Dunnigan, former Director of the Office of Sustainable Fisheries, testified before the Committee on Commerce, Science, and Transportation on the reauthorization of the Magnuson–Stevens Fishery Conservation and Management Act. He stated that fishery management regulations require industry compliance to be effective. Compliance is achieved through voluntary behavior, effective fisheries law enforcement, and effective financial and penal sanctions. To discourage particularly serious violations of the Magnuson–Stevens Act, NOAA must be able to use sanctions that have significant consequences. When fisheries regulations are ignored, it is not only the resource that pays a price, but also the fishers who obey the regulations. Increasing the level of fines and penalties, as well as expanding the types of offenses that can be criminalized under the Magnuson–Stevens Act will help to ensure that sanctions are not simply accepted by violators as the cost of doing business.

NOAA aircraft logged more than 800 flight hours, covered more than 100,000 nautical miles of track lines, and deployed more than 1,900 dropsondes into storms during the 2004 hurricane season. Photo: Office of Marine and Aviation Operations

Key Congressional Hearings—FY 2005

Date	Congressional Committee	Subject	NOAA Witness
January 26	House Committee on Science	Tsunami warnings	Brig. Gen. David L. Johnson, U.S. Air Force (Ret.), Assistant Administrator, National Weather Service
February 3	Senate Committee on Commerce, Science, and Transportation	Tsunamis	Brig. Gen. John (Jack) Kelly, Jr., U.S. Air Force (Ret.), Deputy Under Secretary of Commerce for Oceans and Atmosphere
February 16	House Committee on Transportation and Infrastructure, Subcommittee on Water Resources and the Environment	FY 2006 NOAA budget request for programs that protect and restore coastal and marine resources	Dr. Richard Spinrad, Assistant Administrator, National Ocean Service
February 24	Alaska State Legislature, House Committee on State Affairs	Proposed changes to the Alaska Coastal Management Program	Eldon Hout, Director, Office of Ocean and Coastal Resources Management, National Ocean Service
March 1	House Committee on Resources, Subcommittee on Fisheries Conservation, Wildlife, and Oceans	Coral Conservation Act	Timothy R.E. Keeney, Deputy Assistant Secretary for Oceans and Atmosphere
March 9	House Committee on Resources, Subcommittee on Fisheries Conservation, Wildlife, and Oceans	Global Earth Observation System of Systems (GEOSS)	VADM Conrad C. Lautenbacher, Jr., U.S. Navy (Ret.), Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator
April 14	House Committee on Resources, Subcommittee on Fisheries Conservation, Wildlife, and Oceans	Reauthorization of the Magnuson–Stevens Act and the National Environmental Policy Act	Dr. William T. Hogarth, Assistant Administrator, National Marine Fisheries Service
April 19	House Committee on Resources, Subcommittee on Fisheries Conservation, Wildlife, and Oceans	H.R. 1489, Coastal Ocean Observing System Integration and Implementation Act	Dr. Richard Spinrad, Assistant Administrator, National Ocean Service
April 26	House Committee on Resources, Subcommittee on Fisheries Conservation, Wildlife, and Oceans	H.R. 1428, National Fish and Wildlife Foundation Reauthorization Act	Timothy R.E. Keeney, Deputy Assistant Secretary for Oceans and Atmosphere
May 17	House Committee on Government Reform, Subcommittee on Federal Workforce and Agency Organization	Federal Food Inspection Programs	Richard Cano, Acting Director, Seafood Inspection Program, National Marine Fisheries Service
May 19	House Committee on Resources, Subcommittee on Fisheries Conservation, Wildlife, and Oceans	H.R. 50, NOAA Administration Act	VADM Conrad C. Lautenbacher, Jr., U.S. Navy (Ret.), Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator
May 19	Senate Committee on Environment and Public Works, Subcommittee on Fisheries, Wildlife, and Water	Endangered Species Act	James Lecky, Senior Advisor for Intergovernmental Programs, National Marine Fisheries Service
May 24	House Committee on Resources, Subcommittee on Fisheries Conservation, Wildlife, and Oceans	NOAA's role with the federal fish hatcheries	D. Robert Lohn, Northwest Regional Administrator, National Marine Fisheries Service
May 25	Senate Committee on Commerce, Science, and Transportation	S. 360, a bill reauthorizing the Coastal Zone Management Act	Thomas Kitsos, Associate Deputy Assistant Administrator, National Marine Fisheries Service
May 26	Senate Commerce on Appropriations, Subcommittee on Justice and Science	FY 2006 Commerce Department budget request, including NOAA	Carlos Gutierrez, Secretary, U.S. Department of Commerce
June 8	Senate Commerce Disaster Prediction and Prevention Subcommittee	NOAA's homeland security mission	VADM Conrad C. Lautenbacher, Jr., U.S. Navy (Ret.), Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator
June 8	House Resources Fisheries and Oceans Subcommittee	Scientific review of ocean systems	Dr. Steve Murawski, Chief Science Advisor, Director of Scientific Programs, National Marine Fisheries Service
June 15	Senate Commerce Ocean Policy Study Subcommittee	Management of invasive species in ballast water and threats to coral reefs	Timothy R.E. Keeney, Deputy Assistant Secretary for Oceans and Atmosphere

Date	Congressional Committee	Subject	NOAA Witness
June 29	Senate Commerce Disaster Prediction and Prevention Subcommittee	NOAA's severe weather programs	Max Mayfield, Director, National Hurricane Center, National Weather Service; Dennis McCarthy, Director, Climate, Water, and Weather Services, National Weather Service
July 6 and 8	House Resources Fisheries and Oceans Subcommittee	Fisheries management successes in Alaska and Reauthorization of the Magnuson–Stevens Fishery Conservation and Management Act	Susan J. Salveson, Assistant Alaska Regional Administrator for Sustainable Fisheries, National Marine Fisheries Service
July 20	Senate Commerce Global Climate Change and Impacts Subcommittee	U.S. climate policy and the $5 billion budget request for climate-related science and technology in FY 2006	Dr. James R. Mahoney, Assistant Secretary for Oceans and Atmosphere
July 27	Senate Commerce Disaster Prevention and Prediction Subcommittee	All Hazards Alert Systems Logistics, and Acquisition Division	Mark Paese, Director, Maintenance, National Weather Service
August 1	Senate Commerce Fisheries and Coast Guard Subcommittees	Implementation of the Oil Pollution Act in Washington State	Douglas Helton, Incident Operations Coordinator, NOAA Office of Response and Restoration
September 9	House Government Reform Regulatory Affairs Subcommittee	NOAA's current research priorities for invasive species, New Baltimore, Michigan	Dr. Stephen Brandt, Director, Great Lakes Environmental Research Laboratory
September 19	Special *ad hoc* committee chaired	Great Lakes restoration efforts, Chicago, Illinois	Patricia Montanio, Chief, Damage Assessment Center
September 20	Senate Commerce Disaster Prevention and Prediction Subcommittee	Lifesaving role of accurate hurricane prediction	Max Mayfield, Director, National Hurricane Center, National Weather Service
September 22	Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina	NOAA hurricane forecasting	Brig. Gen. David L. Johnson, U.S. Air Force (Ret.), Assistant Administrator, National Weather Service; Max Mayfield, Director, National Hurricane Center, National Weather Service
September 29	Joint hearing of the House Committee on Resources, Subcommittee on Fisheries Conservation, Wildlife, and Oceans and the Transportation and Infrastructure Coast Guard and Maritime Transportation Subcommittee	S. 362, Marine Debris Research, Prevention and Reduction Act	Timothy R.E. Keeney, Deputy Assistant Secretary of Commerce for Oceans and Atmosphere

FY 2005 KEY EVENTS

October 4–9, 2004
Physical Scientist Dr. Thomas Peterson, of NOAA's National Climatic Data Center, participated as an invited expert to the joint International Research Programme on Climate Variability and Predictability workshop to develop regional climate indices in Southwest Asia, Alanya, and Turkey. The Regional Climate Change Workshop brought together people and data from all areas of Southwest Asia, including Yemen, Oman, Iran, Turkey, Georgia, and Azerbaijan.

October 5, 2004
Vice Admiral Lautenbacher met with the President's Council of Advisors on Science and Technology in Washington, D.C. As a panelist addressing the "Future of Transatlantic Science Collaborations—Success Stories and Trends," and as NOAA's Administrator, Lautenbacher discussed the Global Earth Observation System in the context of international partnerships.

October 5–6, 2004
NOAA Climate Diagnostics Center (CDC) scientists Drs. Henry Diaz and Martin Hoerling joined other climatologists from the United States and Europe in Bologna, Italy, to assess the nature of changes in the climate of the Mediterranean region for the past few centuries. Dr. Diaz, a senior scientist with the Office of Oceanic and Atmospheric Research (NOAA Research), was one of the organizers of this effort to compare the different patterns of change with the Mediterranean climate regions of the western United States. The meeting was held in connection with the United States–Italy Bilateral Agreement on Cooperation in Climate Change Research and Technology. Attendees evaluated possible causes of climate changes and provided a long historical perspective of recent climatic episodes, including the severe droughts in southern Europe and the western United States, and the western European extreme heat wave of 2003, which may have caused approximately 20,000 deaths.

October 7, 2004
Vice Admiral Lautenbacher delivered the keynote address at the National

Space Club Luncheon in Washington, D.C., discussing the ongoing national and international efforts regarding Earth observation and offering a perspective on the future of NOAA satellites.

October 15–17, 2004
NOAA's Assistant Administrator Dr. William Hogarth led the U.S. delegation in a trilateral meeting with Canada and Japan and a quadrilateral meeting with the European Community in Vancouver, British Columbia. The meetings were planned to identify and discuss common objectives and approaches for addressing highly migratory species issues, in preparation for the November annual meeting of the International Commission for the Conservation of Atlantic Tunas.

October 27–28, 2004
NOAA participated in the International Symposium on Climate Change in Beijing, China, as an appointed member of the Scientific Steering Committee. NOAA presented a paper and provided feedback on several topics pertaining to climate change.

October 29–30
NOAA participated in the U.S. Department of Energy–People's Republic of China Science Team meeting.

November 4–6, 2004
The New England Fishery Management Council met to select management measures that will substantially reduce fishing mortality on many stocks of groundfish. The amendment to the Northeast Multispecies Fishery Management Plan was highly controversial due to the relatively large fishing mortality reductions proposed, industry concerns regarding the potential economic and social impacts of further restrictions, as well as disagreement about the underlying science and the fact that the amendment is mandated by a court order.

November 10–14, 2004
A U.S. delegation, comprised primarily of NOAA representatives, attended the 31st annual meeting of the Coordination Group for Meteorological Satellites (CGMS) in Ascona, Switzerland. CGMS is an informal international group gathered to coordinate the global system of operational meteorological satellites, a series of independent national or regional systems. Membership of the CGMS is restricted to the operators of meteorological satellites and to the World Meteorological Organization (WMO) in its capacity as a major user organization. Membership includes China, EUMETSAT (for Europe), India, Japan, Russia, the United States, and the WMO.

November 13, 2004
The National Weather Service (NWS) Weather 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. The NWS Cooperative Observer Program (COOP) is the Nation's weather and climate observing network of, by, and for the people. More than 11,000 volunteers take observations on farms, in urban and suburban areas, national parks, seashores, and mountaintops. The data are truly representative of where people live, work, and play. The John Campanius Holm Award is given to 25 COOP observers annually, and is one of the highest awards an observer can receive.

November 13–15, 2004
NOAA's National Marine Fisheries Service 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" aimed to educate the public, policymakers, and the media on the fishery management process, highlight successful management by region and current management and research initiatives, help bridge the gap between perception and reality regarding fisheries management, and provide a forum for information exchange and solicit a wide range of perspectives on future management and marine research directions.

November 15–24, 2004
Dr. William Hogarth, Assistant Administrator for Fisheries and U.S. Commissioner to the International Commission for the Conservation of Atlantic Tunas (ICCAT), led a U.S. delegation to the Commission's annual meeting in Dublin, Ireland. The 37 Contracting Parties to ICCAT met to discuss 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. The parties are also holding a special workshop on the integrated management of bluefin tuna.

December 10, 2004
NWS, along with representatives from NOAA Research and the U.S. Environmental Protection Agency (EPA), hosted an air quality constituent group meeting in Washington, D.C. This meeting provided opportunities for public- and private-sector stakeholders in air quality forecasting to hear more about progress and plans for launching the NOAA–EPA air quality forecasting capability next summer, as well as to provide input to NOAA on the planned operational capabilities for air quality forecasting.

December 11–12, 2004
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. The discussion identified mercury-related issues that needed to be addressed with additional research. Information from the meeting was used to develop a "life cycle of mercury" program that will follow mercury from its sources to its eventual bioaccumulation in living tissue. There is strong scientific disagreement as to whether the impact of mercury emissions is concentrated in local areas or spread more widely.

February 3, 2005
Vice Admiral Lautenbacher presented Maryland Gov. Robert L. Ehrlich, Jr., and Lt. Gov. Michael S. Steele a satellite image of Hurricane Isabel in Annapolis, Maryland. Isabel caused major damage in much of Maryland, with extensive flooding in Baltimore and Annapolis. The NOAA offices of Satellite Operations and Satellite Data Processing and Distribution where the images were acquired and processed are located in Suitland, Maryland.

February 3, 2005
NWS hosted a meeting with national fire management agencies in Boise, Idaho. Participants reviewed the 2003 fire weather season in light of the 2003 "Interagency Agreement for Meteorological Services between the Wildland Fire Agencies and the NWS" and discussed lessons learned during the season and ways to improve this partnership. 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 attended the meeting.

February 18, 2005
Vice Admiral Lautenbacher delivered welcoming remarks at the Space at the Crossroads Conference, hosted by the United States Space Foundation in association with the Department of Commerce, the Satellite Industries Association, the National Space Society, and the Washington Space Business Roundtable. Lautenbacher spoke on the value of Earth observations and NOAA's satellite programs, and underscored the importance of industry partnerships in these endeavors. A number of aerospace companies, including Boeing and Northrop Grumman, attended the conference in Washington, D.C.

March 23, 2005
Assistant Administrator Dr. William 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 meeting 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 that have resulted from increased imports of shrimp into the U.S. market.

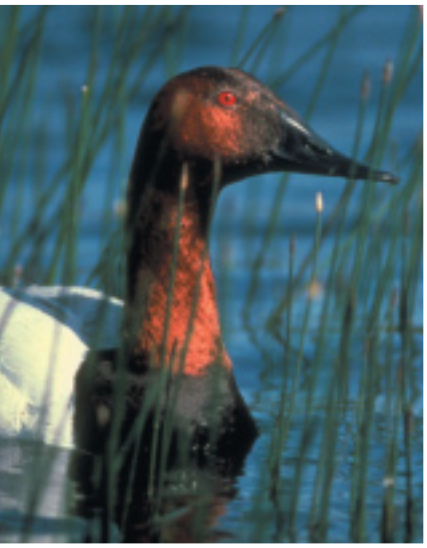
May 31, 2005
Vice Admiral Lautenbacher visited and congratulated students at Woodstock High School in Woodstock, Illinois. A team of Woodstock students submitted the winning name for NOAA's new ocean exploration ship. The winning name, *OKEANOS EXPLORER*, combines the ancient Greek term for ocean with the word meaning "desire to find." Woodstock High School will receive a recognition plaque, and the *OKEANOS EXPLORER* will carry a plaque with information about the winning school and team.

June 1, 2005
NWS hosted federal, state, and local officials from North Carolina to discuss developments in tropical storm forecasting, with a special emphasis on inland flooding. NOAA updated local forecasters on the new tools developed and deployed to improve forecasts and warnings for tropical cyclones and inland flooding. Special attention was paid to the use of NOAA's Advanced Hydrologic Prediction Service. NOAA's partnership with the State of North Carolina is addressing the authorized activities in the Inland Flood Forecast-ing and Warning System Act of 2002. Researchers and local meteorologists provided feedback on what progress still needs to be made, as well as updates on their own innovations.

June 1–3, 2005
Vice Admiral Lautenbacher presided over the second meeting of the Executive Committee of the Group on Earth Observations (GEO) at the World Meteorological Organization headquarters in Geneva, Switzerland. The United States is one of four co-chairs of the GEO Executive Committee, along with the European Commission, South Africa, and China. The GEO Executive Committee began implementing the Ten-Year Implementation Plan for the Global Earth Observation System of Systems adopted by ministers at the third Earth Observation Summit in Brussels in February 2005.

July 20, 2005
Vice Admiral Lautenbacher signed a memorandum of understanding (MOU) with Department of Transportation Federal Highway Administration (FHWA) Administrator Mary Peters. The MOU allows NOAA and FHWA to work closely together to address surface weather transportation issues. Each year, 7,000 deaths, 1.4 million automobile accidents, and $42 billion in economic loss are attributed to adverse weather on the Nation's roads and highways. Most states have surface observation networks to support transportation safety, but the observations are not generally available to NWS or the weather enterprise as a whole. The initial focus of NOAA's Surface Weather Program is to integrate these weather observations to better serve the surface transportation enterprise.

August 18, 2005
Vice Admiral Lautenbacher released *The State of Coral Reef Ecosystems of the United States and Pacific Freely Associated States: 2005*. This significant new report establishes a quantitative baseline of the conditions of U.S. shallow coral reef ecosystems for the first time. This compilation of information from more than 160 scientists and resource managers was coordinated, edited, and published by NOAA's National Centers for Coastal Ocean Science as a project of the Coral Reef Conservation Program. Each jurisdictional chapter provides the geographic extent of reef ecosystems; current monitoring and management activities; information on water quality, benthic habitats, associated biological communities, and key threats to ecosystem health; and recommendations for future research and management actions.



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 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 and Commerce

Emergency Hydrographic Surveys Find Hurricane-Related Obstructions

The 2005 Atlantic hurricane season was one of the busiest in recorded history. The Gulf Coast was hit especially hard when Hurricanes Katrina and Rita struck. NOS Navigation Response Teams conducted emergency hydrographic surveys in the ports affected by the hurricanes. These surveys were critical because of the major oil production and maritime import/export traffic in the region. Local port activity was limited until the surveys were completed and obstructed waterways were cleared. The data collected will also update NOAA's navigation products, including electronic navigational, print-on-demand, and raster nautical charts.

Hardened Tide Stations Withstand Hurricanes' Fury

Hurricanes Katrina and Rita destroyed eight of the 32 tide stations NOS maintains in the Gulf region, and communication with several others was temporarily lost. But two "hardened" stations—those with elevated, strengthened support platforms—along the Gulf Coast operated successfully through both storms, transmitting valuable storm data to meteorologists. In addition, the Galveston Bay Operational Forecast System operated successfully throughout Hurricane Rita. Short-term stations are compensating for the lost

stations in the area, and most communications with other stations in the region have been restored.

New PORTS® Station Installed

A new Physical Oceanographic Real-Time System (PORTS®) station was installed in the Columbia River—the 13th major U.S. waterway to have the system. In port areas, water levels and currents frequently differ from predictions because of wind changes and water runoff. PORTS® provides accurate, real-time oceanographic and meteorological data via the telephone or the Internet, informing vessel operators of water depths and currents so they can move the greatest amount of cargo safely and efficiently. Users of PORTS® information include port authorities, vessel pilots, shipping companies, the U.S. Coast Guard, the U.S. Navy, recreational boaters, fishermen, coastal managers, environmental organizations, academia, and surfers.

GPS Data Enhance NOAA Weather Models

In June, NOAA began to officially incorporate global positioning system (GPS) data from NOS's Continuously Operating Reference Station (CORS) network into its Rapid Update Cycle weather model, which monitors the distribution of precipitous water vapor over the United States. Integrating CORS data with weather models improves weather monitoring accuracy at a minimal cost because it takes advantage of the already existing CORS infrastructure.

Online Operational Forecast Systems Launched

In September, NOS launched three new Operational Forecast System models—two in the Great Lakes and one in Florida. These models provide mariners, port managers, and emergency responders with present (nowcast) and future (forecast) conditions of water levels, currents, water temperature, and other oceanographic parameters. The systems run numerical models hourly (nowcast) to simulate water levels, current velocities, and water temperatures, and four times a day to produce a forecast of water levels, current velocities, and water temperature for the next 30–36 hours. They help port managers and shippers make better decisions involving maximum tonnage and efficient transit schedules, and they improve model results of the trajectory of hazardous material.

Immediately following Hurricane Katrina, NOS collected more than 10,000 aerial images of the hurricane-damaged areas along the coasts of Alabama, Mississippi, and Louisiana. Photo: National Geodetic Survey

Ecosystems

NOS Conducts Aerial Surveys of Hurricane-Damaged Areas

Immediately following Hurricane Katrina, NOS collected more than 10,000 aerial images of the hurricane-damaged areas along the coasts of Alabama, Mississippi, and Louisiana. The Federal Emergency Management Agency, the U.S. Coast Guard, the U.S. Department of Defense, and several state agencies used the critical data to determine response efforts. NOS also provided to the U.S. Geological Survey and others pre-Katrina imagery, digital elevation data, and maps depicting ecological impacts, debris assessment, and wetland losses, to help them determine short-, mid-, and long-term recovery efforts. In addition,

Staff members from the Office of Response and Restoration conduct a shoreline assessment off the shore of Alaska. Photo: Office of Response and Restoration

such companies as Google Earth and GlobeXplorer used the imagery (available on http://ngs.woc.noaa.gov/katrina/) on their Web sites, and the insurance industry used the images to expedite disbursement of claims.

New Tide and Water Quality Monitoring Station Includes Multiple Features

In August, NOS installed a tide and water quality monitoring station at the Wells National Estuarine Research Reserve (NERR) in Wells, Maine. The station, which is the first of its kind installed at a NERR, combines the capabilities of the National Water Level Observation Network (NWLON) and the System-wide Monitoring Network. It includes primary and backup water level sensors, a suite of meteorological sensors, and a water quality sensor that measures several parameters. The NWLON technology allows Wells NERR staff to access water level, weather, and water quality data from the same platform at the same time. Products generated from these data will benefit short-term applications (such as habitat restoration) and long-term applications (such as sea level trends), as well as research and education objectives.

NOAA Supports Restoration of Blackwater National Wildlife Refuge

NOS and the National Marine Fisheries Service are working with the U.S. Geological Survey (USGS), U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, National Aquarium in Baltimore, and others to restore 8,000 acres of wetlands at the Blackwater National Wildlife Refuge in eastern Maryland. Following common observing and data management principles of the U.S. Integrated Ocean Observing System, the partners are collecting water level data so that NOAA can process and analyze the data to apply to the restoration project. The refuge also hosted a workshop on the importance of geodetic control for tidal analysis and applications. After the workshop, a GPS survey was conducted to connect NOAA's and USGS's water level stations and USGS's surface elevation tables to the same geodetic network.

SPLASH Research Cruise Surveys Humpback Whales

This summer, NOS and the National Marine Fisheries Service continued the single largest whale survey ever undertaken to assess humpback whale populations throughout the North Pacific. The Structures of Populations, Levels of Abundance and Status of Humpbacks (SPLASH) project conducted surveys along the U.S. West Coast, emphasizing the five national marine sanctuaries in California and Washington. With this information, scientists will better understand how humpbacks are recovering from the population pressures that resulted from whaling through the mid-1960s, and what threats they currently face. SPLASH's long-term goal is to recover the species to a viable, self-sustaining population throughout its Pacific range.

Coral Reef Bleaching Satellite Monitoring System Launched

In 2005, NOAA launched a Coral Reef Watch Satellite Bleaching Alert system to track thermal stress on corals. When temperature conditions are detected that can lead to coral bleaching, the new system generates automated e-mail alerts. Available for 24 coral reefs around the world, the system allows coral reef managers and scientists to predict coral bleaching outbreaks weeks before they occur, potentially improving prevention and response. To complement NOAA's satellite-

based monitoring, Coral Reef Conservation Program scientists installed the first near-real-time (hourly) monitoring system in the waters near Lee Stocking Island, Bahamas. Part of the Coral Reef Early Warning System (CREWS) of monitoring stations, these new instruments will track "fluorescent yield," a direct measurement of coral reef health. After evaluating this new product, researchers plan to deploy similar instruments in the Great Barrier Reef and in Puerto Rico's waters.

NOAA Awards $10 Million in Coral Reef Conservation Grants

This year, the NOAA Coral Reef Conservation Program (CRCP) awarded nearly $10 million in grants to external partners in support of coral reef management, conservation, education, and research. These awards reflect NOAA's strong support for coral reef conservation efforts outside the agency and represent more than 33 percent of the CRCP budget for 2005. Funds supported a range of activities, from community conservation projects to large-scale coral reef observation systems, and included support for three coral reef research institutes in Hawaii, Florida, and Puerto Rico. Grants also included the jointly managed NOAA–National Fish and Wildlife Foundation Coral Reef Conservation Fund and NOAA's Coral Reef Conservation Grants Program, which supports grants in six categories to address ecosystem monitoring and management, coral reef ecosystem research, improvements to fishery management plans, and national and international conservation efforts.

Major Research Expedition Characterizes Hawaiian Coral Reef Ecosystem

The RV *HI`IALAKAI* completed a 35-day research expedition in the Northwest Hawaiian Islands (NWHI) Coral Reef Ecosystem Reserve and adjacent waters. During the cruise, researchers conducted nearly 500 scuba dives to sample and document the condition of the reefs, which were affected by a major coral bleaching event in 2002. They also deployed oceanographic buoys to allow remote, long-term monitoring of oceanographic and environmental conditions affecting NWHI coral reef ecosystems, and found that an unidentified syndrome discovered last year had spread to two additional reefs. This research will provide valuable characterization of the biology and oceanography of the NWHI, which will serve as a foundation for managing the ecosystem's resources.

Surveys Indicate Invasive Lionfish Is Spreading

NOS scientists conducted surveys at 27 locations from North Carolina to Cape Fear, looking for the Indo-Pacific lionfish. They found lionfish in 95 percent of the locations, which suggests the invasive species is becoming widespread and increasing in density. With other surveys reporting similar results, it is increasingly likely the lionfish will have a significant impact on the ecosystems within Atlantic coastal waters.

New Digital Mapping Product Developed for Pacific Islands

During FY 2005, NOS published *Shallow-water Benthic Habitats of American Samoa, Guam, and the Commonwealth of the Northern*

In recent surveys of the Indo-Pacific lionfish from North Carolina to Cape Fear, NOS scientists found that this invasive species is becoming widespread and increasing in density, and will have a significant impact on the ecosystems within Atlantic coastal waters. Photo: Scripps Institution of Oceanography

Mariana Islands. Available on CD-ROM and on the Web, this digital product includes 34 detailed digital maps depicting the location and distribution of shallow-water seafloor habitats, satellite imagery, and a detailed mapping methodology. It is the first comprehensive assessment of shallow-water benthic habitats for these Pacific Island ecosystems. The maps and associated data products, coupled with a robust archive of marine biological data, serve as valuable tools for evaluating and delineating potential marine protected areas and for developing coral ecosystem monitoring strategies.

Two scientists test sediment for toxicity during a research cruise off the central California coast. Photo: National Centers for Coastal Ocean Science

A biologist from the Office of Response and Restoration tests coastal sediment as part of a local assessment. Photo: Office of Response and Restoration

Coastal Hazards

Hydrographic Surveyors Discover Uncharted Navigation Hazard

During hydrographic survey operations in April, the *THOMAS JEFFERSON* discovered a previously uncharted obstruction in eastern Long Island Sound. Using side-scan sonar, the crew detected the 60-foot-long object, later identified as a crane that was swept into the water during a storm about 25 years ago. The discovery has been identified as a danger to navigation and noted in the U.S. Coast Guard's "Notice to Mariners."

Oil Spill Drill Enhances Safety of Sanctuary Waters

In April, NOS worked with the U.S. Coast Guard, the Florida Department of Environmental Protection, and the Fish and Wildlife Research Institute to conduct an emergency response drill based in the Florida Keys National Marine Sanctuary. During this "Safe Sanctuaries" operation, participants deployed more than 2,700 drift cards to represent an oil spill resulting from a hypothetical ship grounding in sanctuary waters and spilling 270,000 gallons of fuel. The team worked together to collect real-time weather, ocean currents, and aerial observations and deliver this information to HAZMAT and other first responders. The drill offered a successful opportunity to exercise NOAA's Response Plan through coordinated efforts. It also enhanced regional partnerships with response agencies and trustees, and provided training for more than 200 NOAA staff.

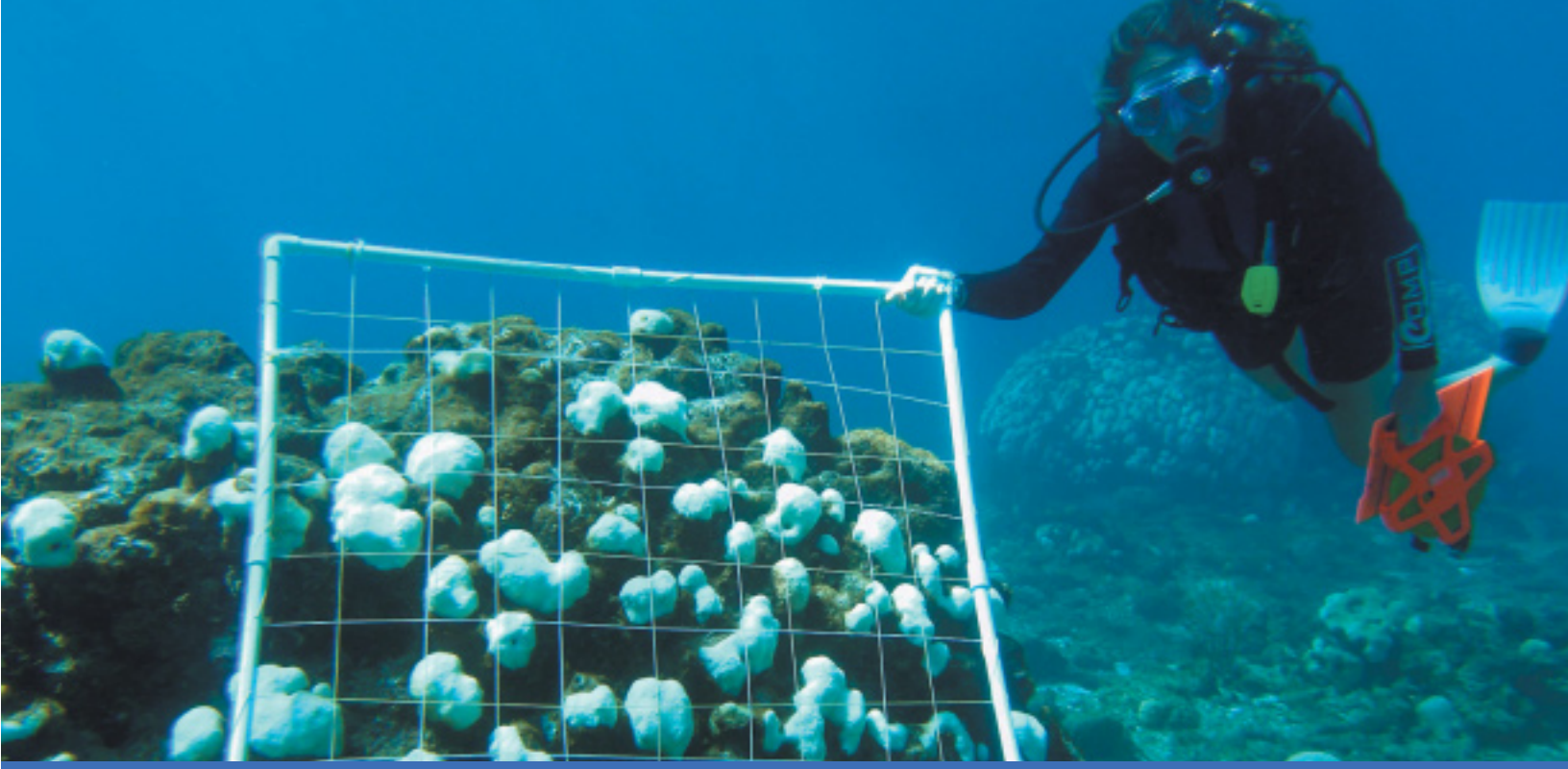
A marine biologist from the National Centers for Coastal Ocean Science conducts critical coral reef monitoring and assessment in the Caribbean. Photo: National Centers for Coastal Ocean Science

NOS Continues to Assess Damages in Delaware River Oil Spill

NOS is continuing to assess and restore losses resulting from a November 2004 oil spill on the Delaware River. The incident occurred when the 750-foot-tanker *Athos I* hit several submerged objects as it was preparing to dock near Philadelphia, Pennsylvania, spilling approximately 265,000 gallons of heavy crude oil into the river. The spill closed the Salem Creek Nuclear Power Plant for 10 days, and prevented shipping operations on the river for 11 days. NOAA has been working closely with the U.S. Fish and Wildlife Service and the states of New Jersey, Pennsylvania, and Delaware to determine the nature and severity of damage to natural resources and the extent of necessary restoration efforts.

NOS Provides Natural Resource Damage Assessment for Alaska Oil Spill

NOS worked with stakeholders and natural resource trustees to provide damage assessments and restoration possibilities in response to a December 2004 ship grounding and oil spill in Alaska's Bering Sea. The cargo vessel M/V *Selendang Ayu* lost power, ran aground, and broke in half on the shore of Unalaska Island, within the U.S. Maritime National Wildlife Refuge. The vessel was carrying approximately 470,000 gallons of fuel oil and threatened the local wildlife and crab fishery. NOS scientists predicted the spill's trajectory, assessed its effects, and prioritized cleanup activities. Public review is



PRODUCTS AND SERVICES

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

Shoreline Mapping
NOS surveys 95,000 nautical miles of U.S. coastline periodically 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.

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.

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 sustainably use and protect their valuable 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.

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.

NOS provided damage assessments and prioritized cleanup activities in response to a December 2004 ship grounding and oil spill in Alaska's Bering Sea. Photo: Office of Response and Restoration

planned for the draft restoration plan and environmental assessment report.

Coastal Communities

New Sea Center Focuses on Marine Conservation

In April, the Ty Warner Sea Center opened in Santa Barbara, California, featuring an exhibit about NOAA's weather and national marine sanctuary missions. Owned and managed by the Santa Barbara Museum of Natural History, the center is an education and research facility focused on marine conservation within the Channel Islands National Marine Sanctuary region. The facility welcomes all ages, but its exhibits and programs are targeted to elementary school children. The new NOAA exhibit includes a multimedia, interactive information kiosk about NOAA weather products; updated information on Channel Islands National Marine Sanctuary research, education, outreach, and resource protection programs; and extensive information on sanctuary species, habitats, and trends.

NOS Supports Cleanup of Vieques, Puerto Rico

NOS is providing scientific support to the U.S. Navy and the U.S. Environmental Protection Agency (EPA) on the investigation and cleanup of Vieques, Puerto Rico. This small island east of Puerto Rico was formerly used by the Navy for military training operations. NOS is helping to assess contamination levels; identifying risks to humans and the environment; and developing strategies to assess, clean up, and restore natural resources.

In addition to technical assistance, NOS conducted a study to determine whether contamination is present in crabs on Vieques. The data will help determine whether certain areas can be re-opened to the public for land crab harvesting, and will be useful in the investigation and cleanup of Vieques.

American Samoa Celebrates 25 Years in the Coastal Zone Management Program

This year, American Samoa celebrated 25 years in the Coastal Zone Management Program. This Pacific island, which has 126 miles of coastline, received federal approval for its coastal zone management program in September 1980. Today, American Samoa is a leader in protecting its coastal resources and serves as a model for the coastal management programs of other Pacific islands.

Organization and Outreach

Teachers and Students Gain Hands-on Learning Experience

In 2005, the Monterey Bay Watershed Education and Training (B-WET) program funded more than $1.2 million in grants to provide teachers and students with hands-on, in-the-field experiences in sanctuary waters. Now in its second year, the Monterey B-WET program has reached more than 7,000 teachers and 200 students.

Estuary Reserve Participates in EstuaryLive

Despite the destruction wrought by Hurricane Katrina, Mississippi's Grand Bay NERR proceeded with its EstuaryLive broadcast, with the help of EPA's Mobile Bay Estuary Program. The Grand Bay NERR and Mobile Bay segment of the national EstuaryLive event allowed students to learn what a hurricane is, how Katrina affected the NERR, how birds and other animals

responded to the storm, and how it affected shellfisheries. EstuaryLive is an interactive "field trip" for K-12 students, available via live Webcasts from NOAA's NERR sites and EPA's National Estuary Program sites. In 2005, more than 29,000 students from around the country participated in the EstuaryLive broadcasts—more than twice the number of the previous year.

FUTURE OUTLOOK

NOS intends to be the global leader in the integrated management of the ocean. By positioning products and processes for the decades ahead, NOS will continue to ensure that the Nation's coastal and marine resources remain safe, healthy, and productive to meet ever-increasing food, energy, security, environmental, and economic challenges. Specific priorities include:

People—Because people are the foundation of NOS's success, NOS will continue to invest in training and career enhancement, offering opportunities for NOS staff to lead at all levels of the organization.

Observations—NOS will be a global leader in designing and implementing an integrated ocean observing system. This effort will include incorporating both *in situ* and remotely sensed measurements, which will provide valuable information for protecting and managing ocean and coastal resources.

Modeling—NOS will be a global leader in applying existing and developing new models to forecast future ocean and coastal conditions to meet the needs of coastal managers and commercial and recreational users.

Watersheds—NOS will be a global leader in applying a watershed approach to managing ocean and coastal resources, acknowledging that the ocean ecosystem is inclusive of white water, brown water, blue water, and the atmosphere.

Partnerships—NOS will be a global leader in forging partnerships across all sectors of society, to maximize the impact of individual efforts and ensure that resource management decisions are made in an integrated manner.

Technology—NOS will be a global leader in identifying and applying existing technologies and in supporting the development of new technologies that will enhance our ability to understand and more effectively manage ocean and coastal ecosystems.

Mission—NOS will continue to assess opportunities for integrating critical ocean and coastal management activities.

An NOS volunteer helps children make fish prints at a community festival in Delaware. Photo: Communication and Education Division

During a research vessel open house and tour, an NOS scientist explains to children how underwater data and samples are collected. Photo: Office of Response and Restoration

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 Service) 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 Service is a world leader in fisheries research, providing the sound scientific foundation for the stewardship of living marine resources. NOAA Fisheries Service is also 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. We will continue to focus our efforts on conservation, management, and sustainable development as we face new challenges in the 21st century.

ACCOMPLISHMENTS

Fish Stocks Rebuilt

The NOAA Fisheries Service *2004 Report to Congress* announced that Pacific whiting has been fully rebuilt since it was first reported as overfished in the 2002 report. As a result of the Commerce Department's efforts to conserve and manage the Nation's fishery resources, six stocks are no longer overfished, and overfishing has been eliminated in three stocks. Additionally, NOAA Fisheries Service made overfished and/or overfishing determinations for 20 stocks whose status was previously unknown. The percentage of stocks with a known population status that are not overfished increased from 64 to 72 percent, while the percentage of stocks with a known fishing rate that are not subject to overfishing has increased from 79 to 81 percent. Overfishing is determined to be occurring for those stocks for which the fishing mortality rate exceeds the level required to produce the maximum sustainable yield (MSY) on a continuing basis. Overfished stocks are those whose biomass is below the minimum stock size required to produce the MSY on a continuing basis.

National Offshore Aquaculture Act Package Submitted to Congress

NOAA Fisheries Service submitted the National Offshore Aquaculture Act to Congress in June 2005. If enacted by Congress, this bill will establish a regulatory system for aquaculture in the U.S. Exclusive Economic Zone (EEZ), allowing for the development of a domestic offshore aquaculture industry with the necessary environmental safeguards. The bill meets an Administration commitment made in the December 2004 *U.S. Ocean Action Plan* to grant the Secretary of Commerce new authority to issue permits for offshore aquaculture in Federal ocean waters.

Magnuson–Stevens Act Reauthorization Submitted to Congress

During FY 2005, NOAA Fisheries Service developed a comprehensive package of amendments to reauthorize the Magnuson–Stevens Fishery Conservation and Management Act. The proposed amendments would implement the requirements of the Administration's *U.S. Ocean Action Plan* related to dedicated-access privilege programs and representation on the Regional Fishery Management Councils. The draft legislation also contains several other key revisions to improve NOAA Fisheries Service's ability to end overfishing, rebuild stocks, and manage healthy U.S. marine fish stocks; ensure the use of information collected through state-of-the-art scientific methods; and improve compliance with fishing regulations.

Guidelines Proposed for Magnuson–Stevens Act National Standard 1

NOAA Fisheries Service proposed improved guidelines to help fishery managers implement National Standard 1 of the Magnuson–Stevens Act, which requires fishery managers to prevent overfishing and rebuild stocks while achieving the optimum yield from each fishery. Under the guidelines, Regional Fishery Management Councils would end overfishing within the first year of a rebuilding plan, except under certain conditions specified in the Act. The Councils would set a more conservation-oriented mid-point as the target time to rebuild, instead of the current common practice of using the maximum allowable rebuilding timeframe. Also, fish stocks for which there is little known scientific information would be grouped into stock assemblages for assessment and management purposes.

Data Collected on Marine Recreational Fishery

NOAA Fisheries Service conducted or administered marine recreational fishery data collections on all coasts, Hawaii, and Puerto Rico in 2005. The recreational fishery harvest, effort, and participation statistics are vital to fish stock assessments, fishery management, and the stewardship of our living marine resources.

NOAA scientists depart in a skiff on a marine mammal study. Photo: John Bortniak, NOAA Corps

NOAA Fisheries Service has proposed improved guidelines to help fishery managers prevent overfishing and rebuild stocks while achieving the optimum yield from each fishery. Photo: NOAA Photo Library

NOAA Fisheries Service conducted or administered marine recreational fishery data collections on all coasts and in Puerto Rico in 2005. Photo: William B. Folsom, NOAA Fisheries Service

Work Begun on National Commercial Fishing Permit System

During 2005, NOAA Fisheries Service began work on developing a national permit system. This component of the Fishery Information System will provide NOAA Fisheries Service a nonduplicative standardized database of permit information. In the future, this system will provide the fishing industry the means to purchase and renew commercial permits electronically via the Internet.

Atlantic Large Whale Take Reduction Plan Revised

In 2005, NOAA Fisheries Service published a proposed rule to further reduce entanglements of large whales in commercial fishing gear along the U.S. East Coast. The rule would revise the Agency's current regulations under the Atlantic Large Whale Take Reduction Plan and require fisheries to use modified gear and expand gear-marking requirements to reduce entanglements. The Agency also proposes to revise boundaries and seasons for management areas and exempted waters.

Impacts of Ocean Acoustics Assessed

NOAA Fisheries Service is investigating all aspects of marine animal acoustic communication and the effects of sound on behavior and hearing in protected marine species. As part of this investigation, In FY 2006, NOAA Fisheries Service will prepare an Acoustics Environmental Impact Statement (EIS) to analyze the potential impacts of applying noise exposure criteria in guidelines to determine what constitutes "take" of a marine mammal under the Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA). In particular, the EIS will identify the potential impacts on marine mammals of human activities that occur in oceanic waters, such as dredging, fishing, shipping, geological exploration, military operations, construction, and acoustic and oceanographic research.

FSV *HENRY B. BIGELOW* Launched

In 2005, NOAA launched the *HENRY B. BIGELOW*, the second of four planned fisheries survey vessels. This ship—the most technologically advanced fisheries survey vessel in the world—will be placed in operation in late 2006. NOAA Fisheries Service designed the *BIGELOW* to meet specific data collection requirements for fishery surveys and tough standards for a low acoustic signature set by the International Council for Exploration of the Seas. This feature will allow the ship to study fish quietly without altering their behavior.

Performance Measures Published for Pacific Salmon Recovery

In July 2005, NOAA Fisheries Service published performance measures for recovering Pacific salmon and reported results in the *2005 Pacific Coastal Salmon Recovery Fund Report to Congress*. With the performance measures in place, the program will be better able to demonstrate success in completing high-priority activities and recovering Pacific salmon to sustainable levels. The report includes a chapter on the status of ESA-listed Pacific salmon and efforts being taken to protect and recover them. Through 2004, the program had funded the restoration of 637 instream miles and 1,355 miles of streambank habitat, removal of 3,566 barriers to fish migration, opening access to 1,520 miles of streams, and protection of more than 51,520 acres of habitat.

ESA Listings and Critical Habitat Designations Finalized

On June 16, 2005, NOAA Fisheries Service published final listing determinations for 16 Evolutionarily Significant Units (ESUs) of Pacific salmon. On September 2, it pub-

lished critical habitat designations for 19 ESUs of salmon and steelhead listed as threatened and endangered under the ESA. The listing determinations and habitat designations, which represent a significant amount of work for NOAA Fisheries Service over the past two years, will help protect and recover salmon and their ecosystems in Oregon, California, Washington, and Idaho.

Restoration Monitoring Information Published for Coastal Habitats

Collaborating with the National Ocean Service, NOAA Fisheries Service compiled key restoration monitoring information applicable to coastal habitats nationwide and published it as a two-volume set. Volume One of *Science-Based Restoration Monitoring of Coastal Habitats* outlines the steps necessary to craft a monitoring plan. Volume Two, designed for practitioners with limited experience in coastal ecology, provides tools for developing and implementing a monitoring plan.

Thousands of Acres of Habitat and Stream Miles Restored

NOAA Fisheries Service, in collaboration with national and regional agencies, as well as its alliances with more than 330 community groups, restored 8,333 acres of habitat in 2005. Since 2001, NOAA has restored 24,916 habitat acres and opened 628 stream miles. Over the next five years, NOAA Fisheries Service aims to restore an additional 22,800 acres and open 3,750 stream miles.

First ESA Listing of Corals Proposed

In 2005, NOAA Fisheries Service proposed listing staghorn coral (*Acropora cervicornis*) and elkhorn coral (*Acropora palmata*) as threatened under the ESA. This would be the first ESA listing of any coral species. Found in shallow water on reefs throughout the Bahamas, Florida, and the Caribbean, these formerly abundant branching corals have remained at low levels without noticeable recovery and, in cases where NOAA Fisheries Service has targeted monitoring data, they continue to decline. Threats to these species include physical damage from human activities and hurricanes, as well as disease and temperature-induced bleaching. NOAA Fisheries Service will publish a final rule to list these species once public comments have been reviewed.

In 2005, NOAA Fisheries Service proposed listing staghorn coral (Acropora cervicornis) *and elkhorn coral* (Acropora palmata) *as threatened under the Endangered Species Act.* Photo: NOAA Photo Library

Since 2001, NOAA has restored 24,916 habitat acres and opened 628 stream miles. Photo: Joni Packard, NOAA Fisheries Service

Regulations Finalized for North Pacific Crab Rationalization Program

NOAA Fisheries Service finalized regulations for the North Pacific crab rationalization program in March 2005. This new program allocates Bering Sea and Aleutian Islands king and Tanner crab fisheries resources not only to fishermen, but also to processors and communities. The new program encourages crab-harvesting cooperatives that can fish individual fishing quotas collectively and cooperatively. The value of Bering Sea and Aleutian Islands crab is expected to increase under the rationalization program. Other rationalization programs, such as the American Fisheries Act pollock cooperatives and the halibut/sablefish individual fishing quota program, have resulted in more valuable, better managed, and safer North Pacific fisheries.

Regional Ecosystems Delineated and Follow-up Workshop Held

Following a major workshop involving 11 Federal agencies, states, academic institutions, councils, commissions, the Coastal States Organization, and nongovernmental organizations, the NOAA Executive Panel approved a set of 10 Regional Ecosystems in November 2004. The Regional Ecosystems include the Arctic Seas (Beaufort Sea and Chukchi Seas combined), East Bering Sea, Gulf of Alaska (which combine to form the Alaskan Ecosystem Complex), California Current, Pacific Islands Ecosystem Complex, Gulf of Mexico, Caribbean, Southeast (Atlantic) Shelf, Northeast (Atlantic) Shelf, and Great Lakes.

As a follow-up to the delineation of Regional Ecosystems, NOAA Fisheries Service provided financial support to the Ecosystem Goal Team, which collaborated with other NOAA Line Offices to hold its first Regional Ecosystem Workshop in the Southeast Shelf Ecosystem in Charleston, South Carolina. The major collaborators in the August workshop included NOAA, The Nature Conservancy, the South Atlantic Fishery Management Council, and several state and nongovernmental organizations in the Southeast. This workshop's purpose was to begin a dialog on potential regional collaboration for ecosystem approaches to resource management, ecosystem indicators, and ecosystem boundary issues.

Economic Surveys of Harvest Activities Initiated

In 2005, NOAA Fisheries Service initiated new economic surveys of harvest activities in five fisheries: Southeast coastal migratory pelagics, Gulf of Mexico reef fish, Alaska crab, and West Coast offshore and nearshore groundfish fleets. Ongoing economic data collection programs continued in the South Atlantic snapper-grouper fishery, all Northeast observed fisheries, Hawaii longline and bottomfish fisheries, and all Southwest observed fisheries. NOAA Fisheries Service's collection of economic data on commercial fishing activities improves estimates of harvest, bycatch, fishing capacity, and ecosystem benefits and helps assess the economic impacts of proposed management options on fishermen.

In addition, NOAA Fisheries Service fielded a national seafood consumption survey in 2005. The first national survey to be conducted in over 20 years, this survey will run for a full year to capture seasonal variation in household demand for seafood.

Observer Coverage Provided for Fisheries

In 2005, NOAA Fisheries Service provided adequate or near-adequate observer coverage for 26 fisheries, with another 16 fisheries having baseline or pilot levels of coverage. A

The new NOAA Fisheries Service program encourages crab-harvesting cooperatives that can fish individual fishing quotas collectively and cooperatively. Photo: Pacific Islands Fishery Science Center