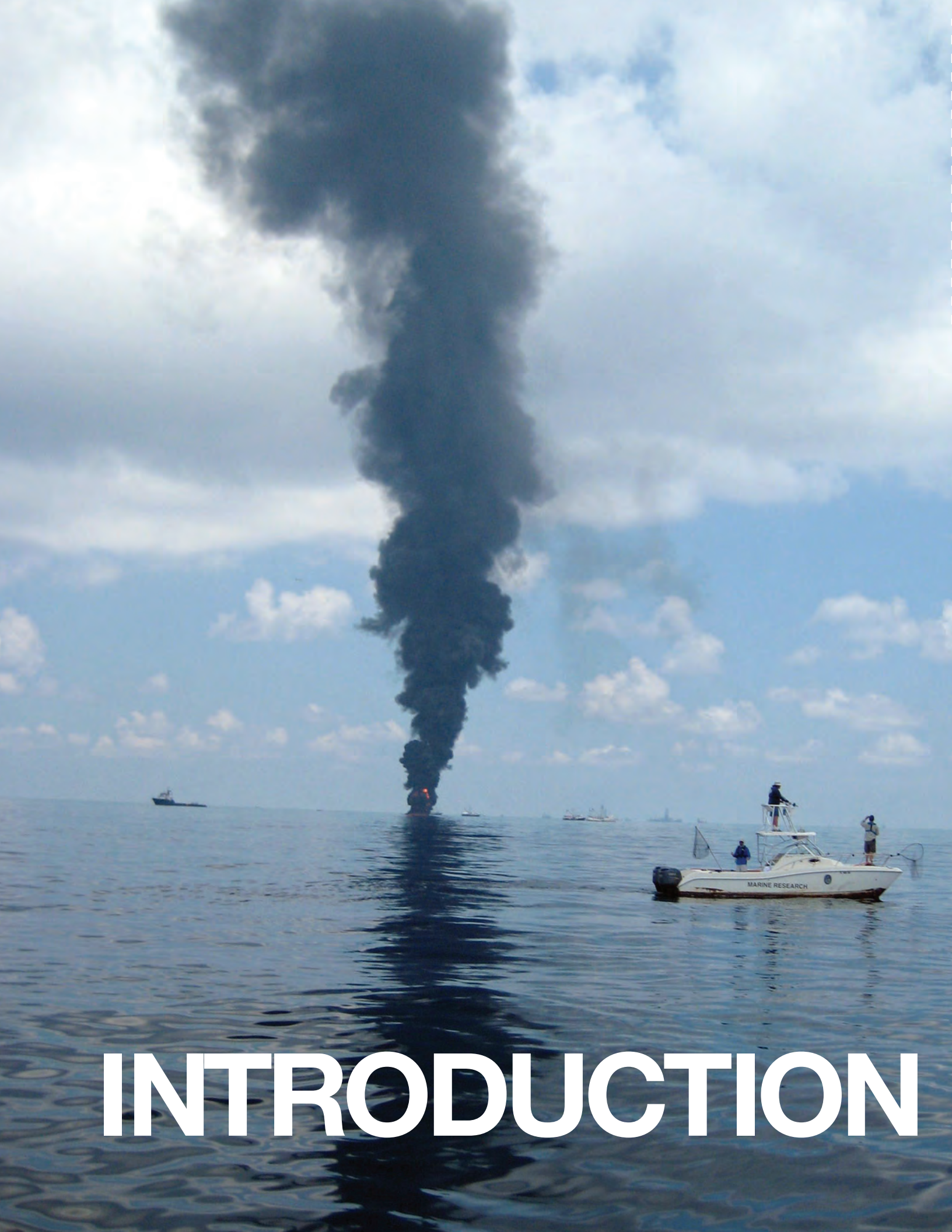


INTRODUCTION

NOAA: PROTECTING LIVES AND LIVELIHOODS

NOAA generates tremendous value for the Nation—and the world—by advancing our ability to understand and anticipate changes in the Earth's environment, improving society's ability to make scientifically informed decisions, delivering services vital to the economy and public safety, and by conserving and managing ocean and coastal ecosystems and resources.

May 27 near the Deepwater Horizon convergence zone showing dark brown and red emulsion oil.

NOAA provides weather, water, and climate forecasts and warnings for the private and public sectors. Annually, NOAA provides 76 billion environmental observations, 1.5 million forecasts, and 50,000 severe weather warnings. Observations from Next Generation Radars have enabled earlier tornado warnings which have reduced anticipated fatalities by 45 percent[1]. NOAA has improved hurricane storm track forecast error by 50 percent since 1990 and hurricane wind speed forecasts by 15 percent since 2004. Hurricane forecast improvements save the U.S. economy approximately $640,000 per mile of coast line by avoiding unnecessary evacuations[2].

NOAA sustains and manages ocean and coastal resources and evaluates the status of, and threats to, protected marine species (whales, seals, etc.). Commercial and saltwater recreational fisheries supported 1.9 million full- and part-time jobs and generated $163 billion in economic activity[3]. NOAA will continue working with the eight regional fishery management councils to implement annual catch limit management programs for all fisheries by 2011 to end and prevent overfishing, improve fisheries management, and put fisheries on a path to sustainability and profitability.

1 Sutter, D., and Simmons, K., 2005: WSR-88D radar, tornado warnings, and tornado casualties. *Weather and Forecasting,* 20(3), 301-310.
2 http://www.economics.noaa.gov/
3 Fisheries Economics of the United States, 2008.

NOAA delivers nautical charts, real time tides and currents, accurate positioning infrastructure, and emergency response support to benefit safe, efficient, and secure transportation on U.S. waterways. The U.S. Marine Transportation System contributes nearly $2 trillion to the GDP and creates over 8 million jobs. NOAA's science and services contribute to the stewardship of our nations coastal and ocean resources and the economic and environmental sustainability of coastal communities. Shore-adjacent counties, that encompass 18 percent of U.S. land area and 36 percent of U.S. population, generate 42 percent of the national economic output. NOAA partners with states to implement a range of programs that help manage coastal resources, such as Coastal Zone Management Act, National Estuarine Research Reserves, and National Marine Sanctuaries.

NOAA also supports world-class science that increases our foundational knowledge of how ecosystems work and continues to make advances in ocean exploration. NOAA's web site (www.noaa.gov) provides a wealth of knowledge to schools, scientists, businesses, managers, and the public.

NOAA's Mission Statement summarizes the Agency's fundamental responsibilities.

NOAA's Mission: SCIENCE, SERVICE, AND STEWARDSHIP

To understand and predict changes in climate, weather, oceans, and coasts

To share that knowledge and information with others

To conserve and manage coastal and marine ecosystems and resources

NOAA's Next Generation Strategic Plan (http://www.ppi.noaa.gov/ngsp.html) presents the goals and objectives of the Agency that will allow NOAA to pursue its mission within the context of a new vision of resilience.

NOAA's Vision of the Future: Resilient Ecosystems, Communities, and Economies

Earth's ecosystems support people, communities, and economies. Human health, prosperity, and well-being depend upon the health and resilience of natural and social ecosystems. NOAA's mission of science, service, and stewardship is directed to a vision of the future where societies and their ecosystems are healthy and resilient in the face of sudden or prolonged change. A vision of resilience will guide NOAA and its partners in a collective effort to reduce the vulnerability of communities and ecological systems in the short-term, while helping society adapt to potential long-term environmental changes.

To this end, NOAA will focus on four long-term goals:

Climate Adaptation and Mitigation: An informed society anticipating and responding to climate and its impacts

Weather-Ready Nation: Society is prepared for and responds to weather-related events

Healthy Oceans: Marine fisheries, habitats, and biodiversity are sustained within healthy and productive ecosystems

Resilient Coastal Communities and Economies: Coastal and Great Lakes communities are environmentally and economically sustainable

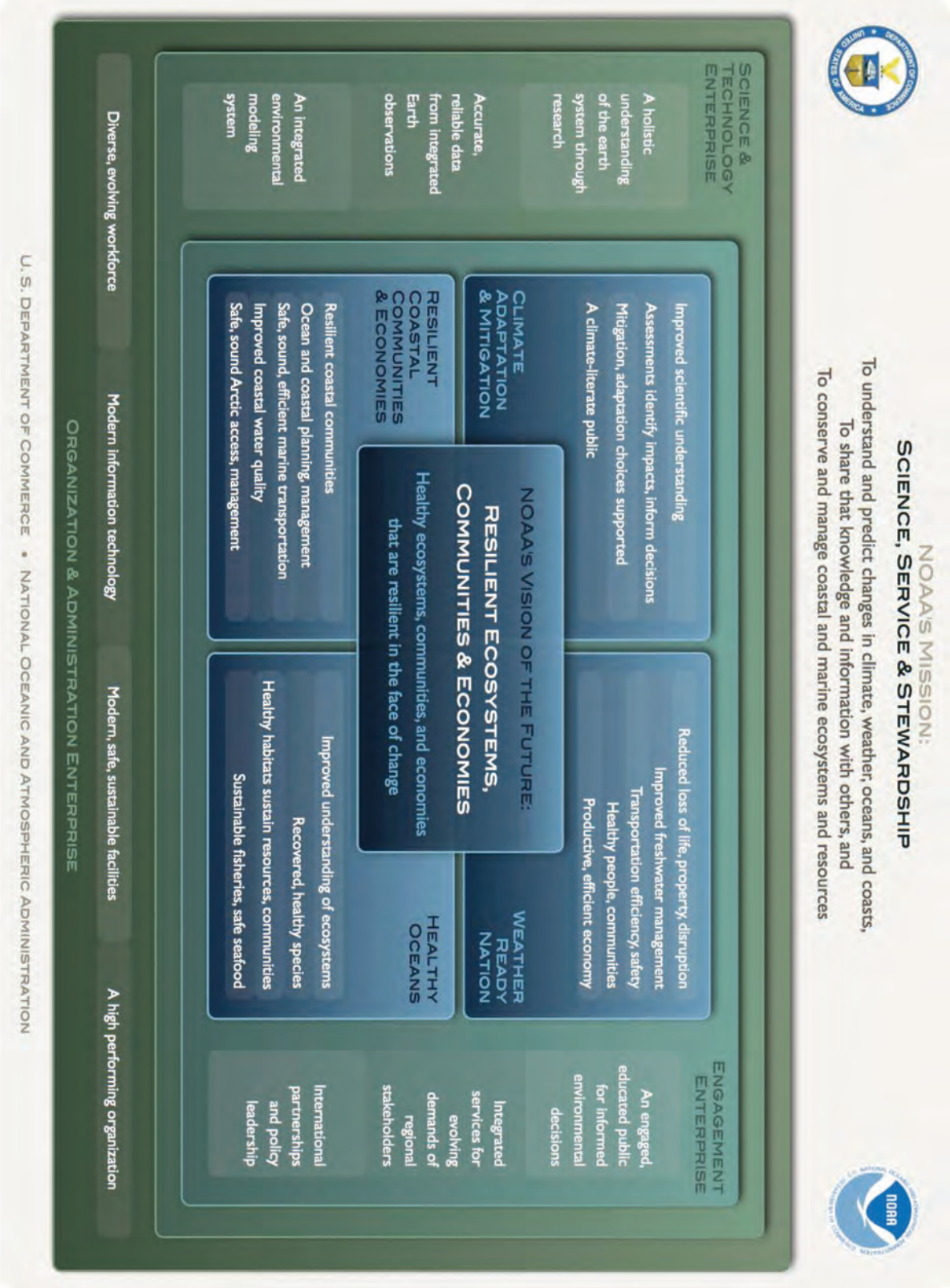
NOAA's ability to achieve these goals is wholly dependent on the Agency's enterprise-wide capabilities that underlie and support all other activities:

Science and technology

Engagement

Organization and administration

An overview of the Next Generation Strategic Plan is presented on the following page, followed by a list of NOAA short-term priorities, developed within the context of these larger, long-term goals.


NOAA'S MISSION:
SCIENCE, SERVICE & STEWARDSHIP
To understand and predict changes in climate, weather, oceans, and coasts,
To share that knowledge and information with others, and
To conserve and manage coastal and marine ecosystems and resources
SCIENCE & TECHNOLOGY ENTERPRISE
A holistic understanding of the earth system through research
Accurate, reliable data from integrated Earth observations
An integrated environmental modeling system
Improved scientific understanding
Assessments identify impacts, inform decisions
Mitigation, adaptation choices supported
A climate-literate public
CLIMATE ADAPTATION & MITIGATION
RESILIENT COASTAL COMMUNITIES & ECONOMIES
Resilient coastal communities
Ocean and coastal planning, management
Safe, sound, efficient marine transportation
Improved coastal water quality
Safe, sound Arctic access, management
NOAA'S VISION OF THE FUTURE:
RESILIENT ECOSYSTEMS, COMMUNITIES & ECONOMIES
Healthy ecosystems, communities, and economies that are resilient in the face of change
WEATHER READY NATION
Reduced loss of life, property, disruption
Improved freshwater management
Transportation efficiency, safety
Healthy people, communities
Productive, efficient economy
HEALTHY OCEANS
Improved understanding of ecosystems
Recovered, healthy species
Healthy habitats sustain resources, communities
Sustainable fisheries, safe seafood
ENGAGEMENT ENTERPRISE
An engaged, educated public for informed environmental decisions
Integrated services for evolving demands of regional stakeholders
International partnerships and policy leadership
Diverse, evolving workforce
Modern information technology
Modern, safe, sustainable facilities
A high performing organization
ORGANIZATION & ADMINISTRATION ENTERPRISE
U.S. DEPARTMENT OF COMMERCE • NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NOAA SHORT-TERM PRIORITIES

Advance Climate Services:

The Climate Service will bring together longstanding NOAA core capabilities into a single, more coordinated and effective organization. NOAA must build on these existing capabilities and grow our capacity to develop and deliver a new generation of climate science and services to our partners, our customers, and the public.

Define the future of NOAA's weather and water services:

As science and technology evolve, we must develop a new vision of weather and water service delivery for the future and build the scientific, technological, and organizational capacity required to achieve that vision.

Provide sustainable seafood and jobs by eliminating overfishing, rebuilding fish stocks, conserving habitat and fostering sustainable aquaculture:

Eliminating overfishing, rebuilding overfished stocks, and enabling ecologically sustainable marine aquaculture helps ensure the long-term sustainability of the U.S. commercial and recreational fishing industries, coastal tourism, and related businesses that support coastal communities. NOAA must continue to implement the innovative policies and collaborative management practices needed to achieve sustainable fisheries seafood.

Promote stewardship of oceans and coasts by implementing the National Ocean Policy (NOP):

For the first time in our nation's history, the United States has a national policy that clearly states, "healthy oceans matter." NOAA is committed to supporting the implementation of the Policy and engaging with our federal partners on the National Ocean Council.

Strengthening science:

Strengthening NOAA's science means promoting scientific excellence and enabling scientists within NOAA to thrive. Working with our partners in academia and the international community, we must embrace new challenges and focus on the integrated observations and data collection, model development, and physical and social science research needed to understand Earth systems and the services they provide.

Support recovery in the Gulf of Mexico:

In collaboration with federal, state, and local partners, NOAA is committed to the long-term restoration of the Gulf of Mexico and to understanding lessons that can be applied in other regions necessary to realize our vision of healthy

ecosystems, communities, and economies that are resilient in the face of change.

Improve understanding, planning, and environmental protection in the Arctic:

The Arctic contains diverse and unique ecosystems and abundant natural resources; the region is also significant because changes in its climate and ecosystems have global impacts. As the region opens up to new development and use, NOAA must engage its diverse and unique capabilities and associated data and information products to rapidly address the emerging environmental, social, economic, safety, and national security issues in the Arctic.

2010 ACCOMPLISHMENTS—

STEPPING UP TO NATIONAL CHALLENGES AND ADVANCING KEY PRIORITIES

2010 was a year of accomplishments and challenges for NOAA. NOAA provided critical response support and science capabilities to the BP Deepwater Horizon Oil Spill Federal response effort while continuing mission critical work and, making significant progress in key priority areas: reforming NOAA's satellite programs, advancing NOAA's climate services, rebuilding fish stocks, and playing a leading role in developing and establishing a National Ocean Policy for the oceans and Great Lakes. NOAA also took significant steps to strengthen the core science that is central to all of its mission areas by convening the first NOAA-wide science workshop to establish a long-term science vision for NOAA.

LTJG Matthew Griffin, sensor operator on the NOAA P3 aircraft, doing aerial photography to document the pre-oiled Louisiana coast for the emergency response effort on May 29, 2010.

NOAA has long been recognized as the leading provider of weather and climate data and forecasts. The year 2010 saw a number of extreme weather events including the historic winter blizzards in the Northeast early in the year, historic flooding in the Midwest and Tennessee, and the third most active Atlantic hurricane season on record. Throughout these and other events, the National Weather Service provided critical information to communities and emergency managers. In February, the Secretary of Commerce announced the intent to create a Climate Service, similar to the National Weather Service, to provide more relevant and useful climate information to businesses and decision makers. Throughout the year the agency has continued to improve its climate science and services provision and advance plans for establishing the new line office.

NOAA's satellite program is the backbone of NOAA's weather and climate data and services. The program provides critical observations and support to all mission areas. The year 2010 saw considerable progress in transitioning the management and structure of the National Polar-orbiting Operational Satellite program to a new NOAA-NASA managed Joint Polar Satellite System, as well as the launch of the newest Geostationary Operational Environmental Satellite Series P (GOES-15), and the finalization of significant international satellite data agreements, all of which will add to our climate and meteorological abilities for years to come.

When the Deepwater Horizon oil rig exploded on April 20, 2010 NOAA responded within hours, providing targeted weather forecasts, oil spill trajectory maps, and mobilizing personnel and assets to respond to what evolved

into the largest oil spill in U.S. history. As the lead federal science agency on oil spills in the marine environment, NOAA's response was immediate and sustained, strategic and scientific. NOAA tracked every aspect of the spill to guide the response operations. It closed and then carefully re-opened fisheries in Federal waters to ensure seafood was safe and it deployed teams to assess, respond to, and minimize consequences to coastal communities, wildlife, and the marine environment. All assets and scientific methods were called into action, including satellites in space, planes in the air, boats on the water, scientists on the ground, and information online.

NOAA's work continues, ensuring the safety of gulf seafood, assessing and cleaning up oil that remains on beaches and in the nearshore, and assessing damages as the lead Federal trustee for the Natural Resource Damage Assessment process. In keeping with its commitment to transparency and scientific integrity, NOAA made it a priority throughout this large scale emergency to share data and information in a timely and responsible fashion to inform the public and local officials and to increase collaboration with independent and academic scientists working in the region.

The widespread economic and human impact of the spill clearly demonstrated that healthy oceans matter. A commitment to coastal communities and a healthy ocean has been a priority of this Administration since it began and in July 2010 the White House announced a National Ocean Policy to ensure a coordinated approach to improving ocean management and health. As the steward of our Nation's oceans and coasts, NOAA played a central role in developing this historic policy and is committed to its successful implementation.

NOAA rose to many challenges in 2010, providing critical information and services to the Nation and the world in times of crisis and moving forward on key program priorities to advance science, service, and stewardship abilities in all its mission areas.

NOAA Ship *Thomas Jefferson* approaches the Deepwater Horizon incident location, collecting water and air samples. Also, utilizing its advanced acoustic intrumentation typically used for hydrographic survey, the *Thomas Jefferson* investigated the undersea oil plume.

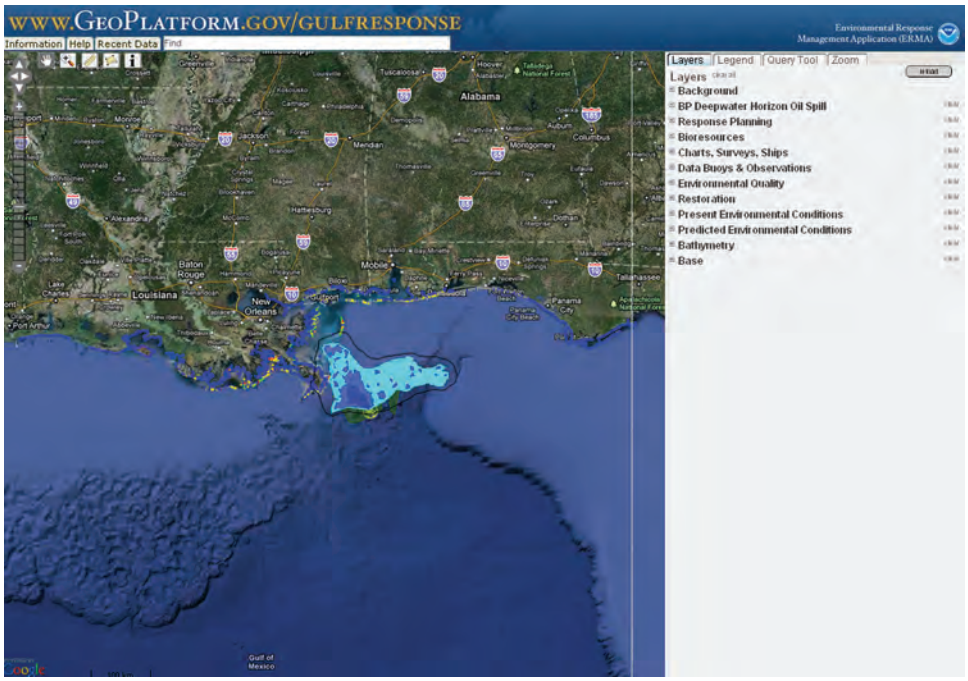
DEEPWATER HORIZON

ONE-NOAA RESPONDS TO THE DEEPWATER HORIZON OIL SPILL

NOAA was on-scene for the April 2010 Deepwater Horizon oil spill from the earliest moments of the crisis. The scale of the Deepwater Horizon spill tested NOAA's capacity to respond to a disaster of such incredible magnitude. However, numerous people throughout the agency rose to the occasion and ensured that NOAA's capabilities and expertise informed response activities, ultimately helping to protect the people in the Gulf Coast region and their livelihoods to the greatest extent possible.

During the course of the response, NOAA staff collectively worked over 384,620 hours in the Gulf and throughout the country, on spill response and damage assessment activities; 7 NOAA ships (39 percent of the NOAA fleet) conducted numerous cruises with missions as diverse as seafood safety monitoring, wellhead monitoring, and detecting subsurface oil; and 5 NOAA aircraft flew over 773 flight hours to track the oil spill and to measure air quality impacts.

NOAA has four primary roles in oil spill response: conducting science, keeping seafood safe, protecting wildlife, and assessing damage.



GeoPlatform.gov/gulfresponse is an online tool that provides near-real time information about the Deepwater Horizon response effort. Developed by NOAA with the EPA, U.S. Coast Guard, and the Department of Interior, the site offers a "one-stop shop" for spill response information.

CONDUCTING SCIENCE

From the very beginning, NOAA provided extensive scientific expertise and monitoring capabilities to inform daily response operations and to help quantify and better understand the impacts of the spill on the Gulf ecosystems. NOAA's information enabled responders to anticipate where the oil was going and to predict what areas might be impacted. Two hours and 14 minutes after the rig exploded, NOAA issued the first spill trajectory map. Ultimately, NOAA produced hundreds of 24-, 48-, and 72-hour oil trajectory forecasts, 30 loop current location graphics, 3000 spot-weather forecasts, and 50 shoreline impact forecasts – all of which were vital in informing response actions. NOAA used all types of technologies to guide response operations and assist with trajectory modeling, including satellites to analyze surface conditions and underwater unmanned gliders owned by NOAA's university partners to peer below the surface. NOAA also created the Gulf of Mexico Geoplatform.gov (http://www.geoplatform.gov/), a new online tool that employed a web-based GIS platform and provided near-real time information about the response effort. This site offered the public a "one-stop shop" for spill response information.

Steve Wilson, chief quality officer for NOAA's Seafood Inspection Program, demonstrates sensory analysis of a sample of shrimp on July 8, 2010 at NOAA's National Seafood Inspection Laboratory in Pascagoula.

KEEPING SEAFOOD SAFE

NOAA worked with the Food and Drug Administration (FDA), Environmental Protection Agency (EPA), and Gulf States to ensure that fish and shellfish harvested from the Gulf of Mexico were safe to eat and of highest quality. These measures benefit both consumers and the families who make their living from the Gulf's resources. If oil was present or threatened a location, NOAA proactively closed that area to commercial and recreational fishing. On June 2, 2010, the closed area was at its largest – measuring 88,522 square miles (approximately 37 percent of Gulf of Mexico federal waters). NOAA and our partners also developed a testing protocol to ensure fish were safe prior to re-opening closed areas.

Dr. Brian Stacy, a NOAA veterinarian, is pictured here cleaning a Kemp's ridley turtle aboard the vessel before the turtle is taken to Audubon Aquarium of the Americas in New Orleans for rehabilitation. In all, almost 500 turtles were brought in to be rehabilitated; nearly three-quarters of them have been released back to healthy habitat.

PROTECTING WILDLIFE

As stewards of our Nation's coasts, oceans, and marine wildlife, NOAA was, and continues to be, concerned about the short-term and long-term impacts of the oil spill on the ecological health of the Gulf of Mexico and the marine life it supports. NOAA experts worked with a network of partners to rescue and rehabilitate sea turtles and marine mammals and helped to determine the highest priority habitats and areas in need of direct response resources, such as the deployment of boom and shoreline cleanup crews. NOAA staff helped man 5 turtle rescue boats in search of oiled turtles and well over 150 turtles were rescued and rehabilitated.

Assessing Oiling of Marshes in Barataria Bay, LA

ASSESSING ECOSYSTEM DAMAGE

NOAA is the lead agency for the Natural Resource Damage Assessment (NRDA) process helping identify and quantify short- and long-term impacts to the Gulf of Mexico's thriving ecosystems. Quantifying these impacts is critical to ensuring that there is a true understanding of the extent of the damages. By April 23, one day after the oil leak was discovered, NOAA scientists began pre-assessment activities by identifying a range of potentially affected habitats and organisms. On any given day, more than 40 teams from across NOAA were in the field collecting data on these resources and their lost use. NOAA continues to collaborate with various federal and state agencies, industry, and citizens to collect data in the Gulf of Mexico and across the affected states to determine which natural resources have been harmed, which remain in jeopardy, and which human uses have been lost. With an understanding of ecosystem assessment and life in the Gulf, we will be better able to develop the best management tools for restoration of this valuable, integrated ecosystem.

Lt Cdr Marc Pickett and Lt Mark Sarmek wrestle to free an entangled Hawaiian Monk Seal from a derelict fishing net

NOAA PROGRAM ACCOMPLISHMENTS

MARINE DEBRIS PARTNERSHIP ADVANCED DETECTION OF DERELICT FISHING GEAR AND "FISHING FOR ENERGY" HONORED

Derelict fishing gear is one of the major types of debris impacting the marine environment today. It can entangle and potentially kill marine life, smother habitat, and act as a hazard to navigation. In partnership with several NOAA line offices, other federal agencies, the State and University of Hawaii, and the private sector, the NOAA Marine Debris Program increased the capacity to detect derelict fishing gear in the open ocean. NOAA's Marine Debris Program - Hawaii office - worked with the National Aeronautics and Space Administration (NASA), NOAA's Unmanned Aerial Systems Program, the Coastal Storms Program, and the Office of Marine and Aviation Operations to develop and test new sensor-and-platform systems to detect and ultimately remove derelict fishing gear before it enters sensitive near-shore environments. Additionally, the Fishing for Energy partnership was awarded the Coastal America Partnership Award due to its innovative efforts to provide fishermen with a no-cost disposal option for old or derelict fishing gear. Fishing for Energy is a partnership between NOAA's Marine Debris Program, Covanta Energy Corporation, the National Fish and Wildlife Foundation (NFWF), and Schnitzer Steel for reducing derelict fishing gear through prevention activities and working with the fishing community and related industries to find positive solutions to address derelict fishing gear. Once gear is removed from the environment, it is transported to the nearest Energy-from-Waste facility where it is used to create clean energy. The partnership collected over 350 tons of old fishing gear between February 2008 and May 2010 from ports in Maine, Massachusetts, New York, Rhode Island, New Jersey, Virginia, and Oregon (three ports were added to the partnership in FY 2010 and more will be added in FY 2011). Approximately one ton of derelict nets can provide enough electricity to power one home for 25 days. For more information on the partnership, visit www.nfwf.org/fishingforenergy.

Red tide cell concentrations around South Padre Island.

HARMFUL ALGAL BLOOM FORECASTS IN NORTH ATLANTIC AND GULF OF MEXICO HELPED COMMUNITIES PREVENT SHELLFISH POISONINGS

In 2010, the Gulf of Maine Toxicity project, an outlook for significant regional blooms of toxic algae that cause 'red tides' in the spring and summer, was issued for the first time. Although the algae in the water pose no direct threat to human beings, toxins produced by the algae can accumulate in mussels and clams and cause paralytic shellfish poisoning in humans who consume them. Scientists have been reluctant to make a "forecast" of precisely where and when the bloom will make landfall because bloom transport depends on weather events that cannot be predicted months in advance. However, new research has shown that cyst abundance in the fall can be an indicator of the magnitude of the bloom in the following year. Early warnings of algal blooms can give shellfish farmers and fishermen the opportunity to shift the timing of their harvest or postpone plans for expansion of aquaculture beds. Area restaurants may also benefit from advance warnings by making contingency plans for supplies of seafood during the summer. This past year, NOAA offices collaborated to warn an isolated area in the Gulf of Maine (via NOAA Weather Radio) of high toxin values in local shellfish. As in the past, effective monitoring succeeded in preventing illnesses from legally harvested shellfish.

In addition, NOAA's Harmful Algal Bloom Operational Forecast System (HAB-OFS) provides information on the location, extent, and the potential for development or movement of harmful algal blooms in the Gulf of Mexico. Texas officials and coastal managers can now receive weekly bulletins about potential outbreaks of toxic algae that threaten public health and affect beach and fishing activities along the coast. NOAA has had an operational forecast in the eastern Gulf of Mexico for harmful algal blooms since 2004, but this expansion of the operational system allows daily review of conditions with coastal managers from all of the Gulf of Mexico states.

Halibut fishing in Sitka, Alaska

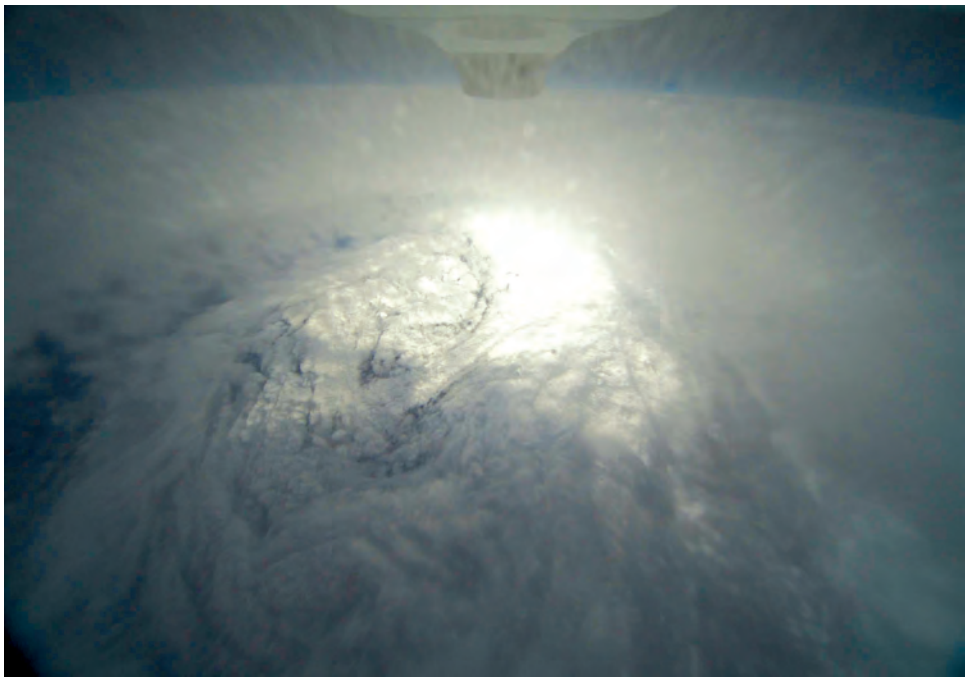
THREE NEW CATCH SHARE PROGRAMS IMPLEMENTED IN 2010

To help rebuild fisheries and sustain fishermen, communities, vibrant working waterfronts, and culturally important fishing traditions, NOAA released a national catch share policy to encourage the consideration and use of catch shares in fishery management plans. Catch share programs, which include limited access privilege programs and individual fishing quotas, dedicate a secure share of fish to individual fishermen, cooperatives, or fishing communities. In the United States, catch shares are used in 14 fisheries managed by 6 different fishery management councils from Alaska to Florida and are being developed in additional fisheries. Both here and in other countries, catch shares are helping to eliminate overfishing and achieve annual catch limits; improve fishermen's safety and profits; and reduce the negative biological and economic effects of the traditional "race for fish." In 2010, the National Marine Fisheries Service (NMFS) implemented three new catch share programs, including the Gulf of Mexico Grouper and Tilefish Individual Fishing Quota (IFQ), Atlantic Sea Scallops IFQ, and the Northeast Multispecies Sectors.

Adult female blue king crab with eggs that were expected to hatch in spring 2010.

FOUR FISH STOCKS REBUILT TO OPTIMAL LEVELS

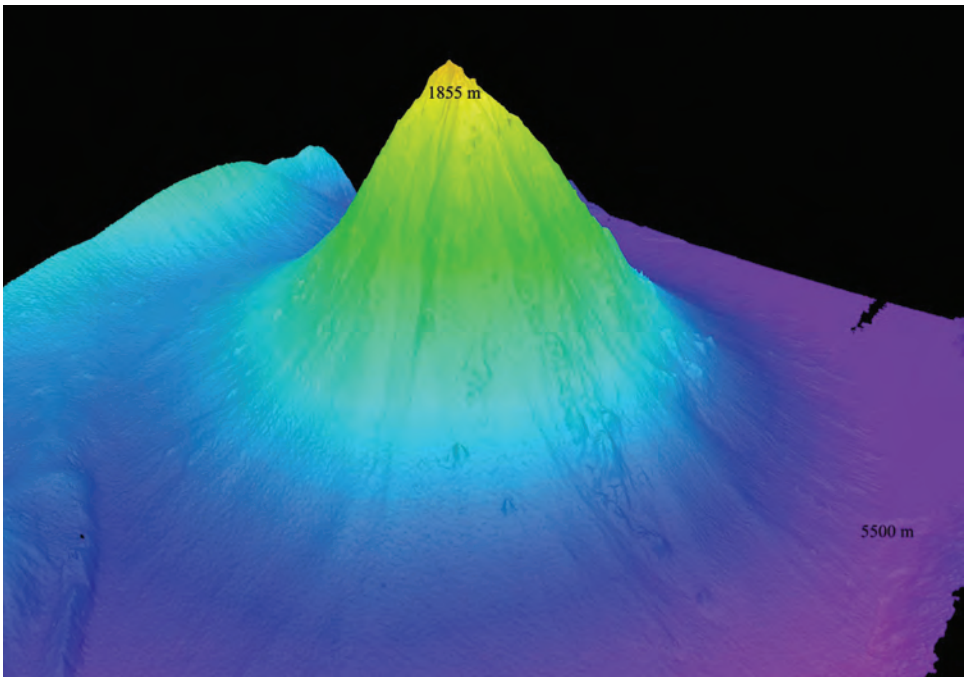
During FY 2010, NOAA rebuilt the following four fish stocks, important to commercial and recreational fisheries, to optimal population levels: North Atlantic swordfish, Georges Bank haddock, Atlantic coast spiny dogfish, and St. Matthews Island blue king crab. These stocks had been under rebuilding plans due to low population levels caused by overfishing and other factors. Through the use of fisheries management measures to ensure the health and viability of the stocks, NMFS tied the record set in FY 2009 for the greatest number of fish stocks rebuilt in a single year.



Hurricane Earl as seen from the unmanned aerial system (UAS) Global Hawk

OBSERVATIONS PLAYED A CRITICAL ROLE IN HURRICANE FORECASTING RESEARCH

Due to the combined 2010 hurricane field programs of NOAA, NASA, and the NSF, Hurricane Earl, a category 4 hurricane, became the best sampled tropical cyclone of all time. Scientists from the Atlantic Oceanographic and Meteorological Laboratory (AOML) collected data almost continuously over a 7-day period while aboard NOAA's hurricane hunter for a total of 18 flights. These data documented Earl's rapid intensification, weakening, and early stages of extratropical transition. Hurricane Earl also marked the first flight of an unmanned aerial system (UAS), NASA's Global Hawk, above a fully-developed tropical cyclone, allowing AOML and NASA researchers to collect data and images of Earl at 60,000 feet. Improving the use of observations is a major component of NOAA's Hurricane Forecast Improvement Project (HFIP), which is close to meeting its five-year goal for a 20 percent improvement in forecasting hurricane intensity.



This is a perspective view of the Kawio Barat (West Kawio) seamount looking from the northwest. The underwater volcano rises around 3800 meters from the seafloor. Image courtesy of INDEX 2010: "Indonesia-USA Deep-Sea Exploration of the Sangihe Talaud Region"

NOAA SHIP EXPLORED UNDERSEA, MAPPED INDONESIAN OCEAN SEAFLOOR

In the first week of a joint Indonesia-U.S. expedition to explore the deep ocean north of Sulawesi, Indonesia, the NOAA Ship *Okeanos Explorer* used its built-in multibeam sonar to map a huge undersea volcano. The ship's remotely-operated vehicle also took high-definition images of the feature called Kawio Barat, referring to the ocean area west of Kawio Islands. The undersea volcano is taller than all but three mountains in Indonesia and rises more than 10,000 feet from the seafloor in water more than 18,000 feet deep. The discovery and characterization of the volcano and habitats will help increase our understanding of habitat-species associations and biodiversity, issues that are important for making decisions on how to manage human activities in the marine environment. Using a new model of exploring the ocean through telepresence, most scientists worked from shore. Scientists at the Exploration Command Centers in Jakarta and Seattle were connected to *Okeanos Explorer* live via satellite and high-speed Internet pathways and were able to interact with shipboard personnel to guide the expedition. The success of having scientists command operations from these shore-based centers has initiated a new approach for ocean exploration, research, and education where the results are available in real-time. In addition, NOAA partnered with Google to incorporate all high resolution multibeam data collected by the *Okeanos Explorer* into Google's base bathymetry layer that is accessible publically in Google Earth (http://bit.ly/eDGybQ).

NOAA's Climate Services portal

On February 8, 2010, DOC and NOAA announced the intent to create a Climate Service and concurrently unveiled a new Web site, www.climate.gov, that serves as a single point-of-entry for those looking for NOAA's climate information, data, products, and services. Known as the NOAA Climate Services Portal, the site is designed to address the needs of four key audiences: decision makers and policy leaders; scientists and applications-oriented data users; educators; and businesses and the public. The site responds to growing user demand for useful climate information and will continue to develop based on user comments and feedback as it expands into a fully operational resource. One feature is the new Web-based climate science magazine, *ClimateWatch,* featuring videos, images, and articles of scientists discussing their recent work in the field. NOAA will continue to build upon its existing capabilities to improve our scientific and technological capacity to develop and deliver a new generation of climate science and services to our partners, our customers and the public.

COMMERCE SECRETARY GARY LOCKE AND UNDER SECRETARY DR. LUBCHENCO UNVEILED LANDMARK CLIMATE.GOV PORTAL

NOAA's workshop report on REgional Integrated Science and Assessment (RISA) program: *Looking Ahead at Climate Service, Assessment, and Adaptation* (full report available at http://www.cpo.noaa.gov/cpo_pa/risa/pdf/RISAWorkshopReport.pdf)

REGIONALLY INTEGRATED SCIENCE AND ASSESSMENT TEAMS EXPANDED

NOAA's Climate Program Office has nearly doubled funding for Regionally Integrated Science and Assessment (RISA) teams and expanded the network by nearly 20 percent since 2009. RISAs are expected to play a critical role in both climate science and service development by providing integrated assessment in 11 different regions of the United States and the National Climate Assessment identifying vulnerabilities, needs, and capabilities of users. RISAs are regional "centers of excellence" that work with users (policymakers, resource managers, communities, etc.) to co-develop climate science and services. Aside from being user-driven, RISAs are structured around the requirements of sustained regionally-based interactions; interdisciplinary assessment and science (not just climate science); ongoing climate literacy efforts; a focus on both climate variability and climate change; and interagency partnerships that leverage different capabilities and resources. In future years, the sustained regional capacity of RISAs can help NOAA address the Nation's priorities for climate service and adaptation.

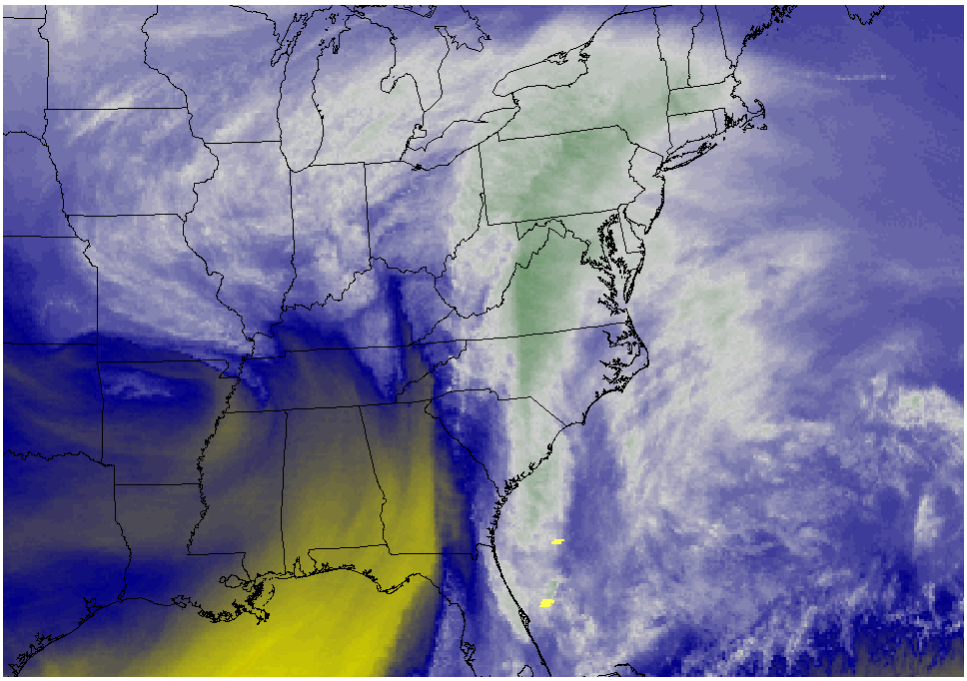


Image of Feburary 2010 "Snowmageddon" taken from NOAA's Cooperative Institute for Meteorological Satellite Studies (CIMSS)

NOAA'S NATIONAL WEATHER SERVICE PROVIDED EARLY WARNINGS FOR HISTORIC 2010 MID-ATLANTIC "SNOWMAGEDDON" SNOWSTORMS

During a five-day period in early February 2010, two snowstorms of historic proportions struck the Mid-Atlantic region. The first storm hit February 5-6 and produced record setting snowfalls in excess of 20 inches in the Washington, DC area. The NWS issued accurate outlooks for this storm 3 days in advance with an unprecedented forecast of 20 to 30 inches before the first flakes were observed. NOAA forecasts had an average lead time of 42 hours for a winter storm watch, which provided local emergency managers with almost two days of preparation time. Three days later, a second blizzard struck the same region with an additional foot and a half to three feet of snow, which brought the total snow accumulation on the ground to three to five feet in places. NOAA accurately forecasted this second storm 4 days in advance, with an average lead time of 47 hours for winter storm watches and an average lead time of 32 hours for winter storm warnings. NOAA's Weather Forecast Office (WFO) staff provided exemplary service during these consecutive, extreme events that generally shut down the region, including governments, schools, businesses, roads, and airlines.

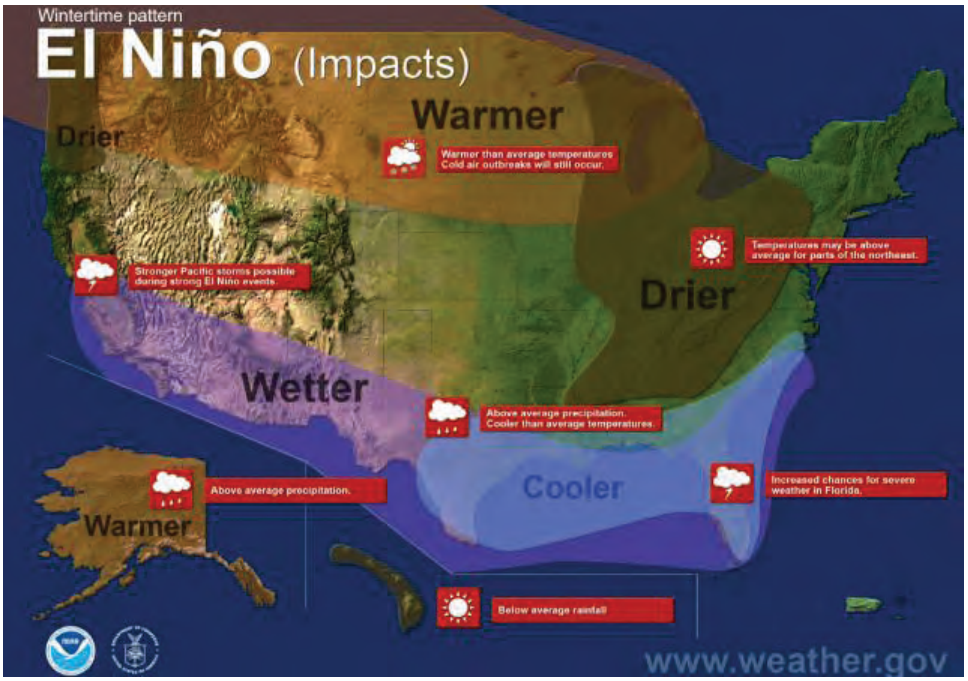


Image from NWS's "El Niño Road Show"

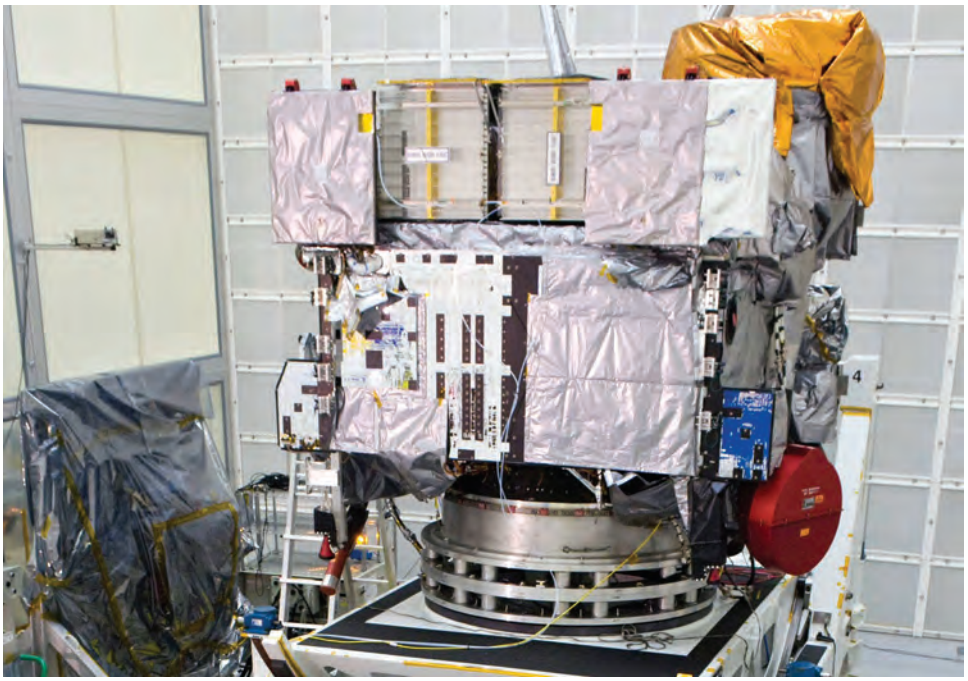
NWS PREPARED PUBLIC AND PARTNERS FOR EL NIÑO

In 2009 and 2010, NWS launched an aggressive geographically-targeted information campaign to prepare people and communities for dealing with the potential wintertime effects expected from a developing El Niño. El Niño impacts weather and climate patterns, significantly altering local droughts and floods, increasing the number of tornadoes, and affecting business sectors such as agriculture and recreation. NWS conducted approximately 40 public outreach activities dubbed "El Niño Road Show" for the media and NWS partners in Texas, California, Washington, the District of Columbia, North Carolina, Florida, Arizona, Hawaii, Guam, and other Pacific islands. Experts from the Climate Prediction Center and Pacific ENSO (El Niño-Southern Oscillation) Application Climate Center joined local NWS WFO staff to provide briefings and media interviews with state partners. News media, representatives from the governors' offices, and emergency management officials were invited to the briefings. Each road show event focused on the specific impacts to the visited region. For example, in Florida, NOAA noted that the state's manufactured home parks and campgrounds were at higher risk due to high density and high winter occupation rates. In the Northeast, ski lodge owners were provided with information to prepare for the possibility of less natural snow for skiing, and retail businesses were made aware of potentially less need for winter consumer goods, such as heavy clothing and plows. This targeted information helped people prepare productively for the winter El Niño.

Red River flooding in Fargo, North Dakota

NWS PROVIDED KEY SUPPORT AND FORECASTS FOR SPRING 2010 RED RIVER FLOODING RESPONSE

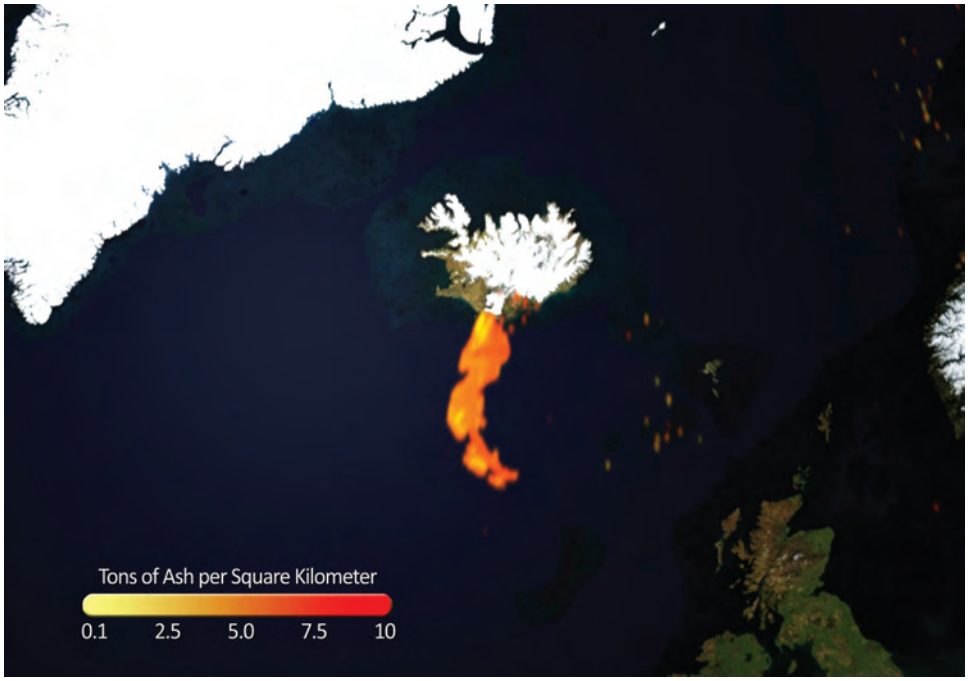
In early November 2009, according to the U.S. Geological Survey, the flow of the Red River at Fargo, ND was at its highest level ever recorded for the month of November. Key decision-makers became concerned about the potential for flooding in 2010 similar to that experienced in 2009. During the Spring 2010 event, NWS offices in the Central Region provided Integrated Decision Support Services to varied customers. NOAA's Regional Operations Center (ROC) provided video teleconference and telephone briefings to personnel at Federal Emergency Management Agency (FEMA) Regions V, VII, and VIII and coordinated the overall information to support decisions at state and local levels. Two River Forecast Centers (RFCs) (North Central and Missouri Basin) collaborated closely with the U.S. Coast Guard and the U.S Army Corps of Engineers on modeling efforts. Five local WFOs provided staff for the state Emergency Operations Centers in North Dakota, South Dakota, and Minnesota, and the local WFO in Grand Forks provided personnel to the cities of Fargo and Moorhead—particularly high impact locations—to provide information to support decisions. Senators from both North Dakota and Minnesota visited the Fargo/Moorhead area and had the opportunity for face-to-face briefings from the WFO Grand Forks Meteorologist-In-Charge. Focused information and forecasts yielded many positive results within the Red River Valley, including FEMA approval of a disaster declaration for North Dakota prior to the actual onset of flooding along the Red River, which enabled the mobilization of emergency power, medical services, food and shelter.



GOES-P Satellite under construction

NEWEST NOAA GEOSTATIONARY SATELLITE REACHED ORBIT

On March 4, 2010, NOAA successfully launched the Geostationary Operational Environmental Satellite - P (GOES-P) from Cape Canaveral, FL. GOES-P, which was renamed GOES-15 once it reached final orbit, underwent a series of tests for approximately six months before completing its "check-out" phase. GOES-15 will capture higher resolution images of weather patterns and atmospheric measurements than those provided by earlier satellites allowing forecasters to pinpoint the location of severe weather with greater accuracy. GOES-15 will also provide better data for space and solar weather thanks to its Solar X-Ray Imager (SXI). SXI data will improve forecasts and warnings for solar disturbances, protecting billions of dollars of commercial and government assets in space and on the ground. This vital information will also reduce the effect of power surges for the satellite-based electronics and communications industry. GOES-15 is the final spacecraft in the latest series of NOAA geostationary satellites. It joins three other NOAA operational GOES spacecraft; after check-out, GOES-15 was placed into orbital storage mode and remains ready for activation should one of the operational GOES fail.



Data from the NASA Aqua/MODIS satellite shows the concentration of ash being emitted from the Eyjafjallajökull volcano.(NOAA Environmental Visualization Lab)

CRITICAL INFORMATION PROVIDED DURING THE ICELANDIC EYJAFJALLAJÖKULL VOLCANIC ERUPTION

In response to the eruption of the Eyjafjallajökull volcano in April 2010, NOAA satellites began providing near-real-time information about the resulting ash cloud to the London Volcanic Ash Advisory Center. Volcanic ash poses a major threat to jet aircraft and must be avoided. The Icelandic volcano's eruption led to the unprecedented closure of North Atlantic and European airspace, disrupting commerce and travel in the area for a month long period. Using an algorithm developed for the next generation geostationary satellite series, GOES-R, and data from the European Organisation for the Exploitation of Meteorological Satellites's Spinning Enhanced Infrared and Visible Imager, NOAA provided estimates of volcanic ash cloud height, mass loading, and particle size. These data proved critical to tracking and forecasting the dispersion of dangerous volcanic ash clouds and eventually determining when the airspace could be re-opened.

Satellite antennae at Fairbanks Alaska Satellite Operations Facility (FSOF)

CONSTRUCTION COMPLETED OF FAIRBANKS ALASKA SATELLITE OPERATIONS FACILITY

NOAA achieved a major infrastructure milestone in FY 2010 with the construction of the Fairbanks Alaska Satellite Operations Facility (FSOF), a new operations center for satellite command and control. FSOF, which was completed on September 30, 2010, will support a broad range of U.S. and international environmental monitoring satellites, thus providing critical datasets, products, and services to users worldwide. FSOF replaces the current Fairbanks Command and Data Acquisition Station, parts of which dated back to the early 1960s. Modernizing this facility ensures reliable and robust satellite tracking for NOAA far into the future. On a global scale, public safety and economic interests will continue to benefit from the comprehensive and accurate information derived from the site's work. The new 20,000 square foot FSOF was a shovel-ready project, using *American Recovery and Reinvestment Act* (ARRA) and NOAA appropriated funds to complete the project. The U.S. Army Corps of Engineers oversaw construction, which took place between July 2009 and September 2010. Satellite operations will transition to FSOF during the first three quarters of FY 2011.

Jason Project "Argonauts" deploy a NOAA drifting buoy in the Channel Islands

NOAA SCIENTISTS SUPPORTED NATIONAL GEOGRAPHIC'S THE JASON PROJECT

NOAA scientists are working on *National Geographic's* The JASON Project, which is a new climate mission for teachers and students focused on observing the ocean to understand climate. Two NOAA scientists served as NOAA host researchers and worked side-by-side with JASON students to teach them how skills in math, applied technologies, and scientific interpretation are necessary to understand the full effects of climatic change. The JASON Project Climate Mission in the Channel Islands allowed student and teacher "Argonauts" to deploy drifting buoys and an autonomous underwater vehicle, which generate ocean temperature and circulation data that can be applied to predictions of global climate change. NOAA is in the process of developing an entire climate curriculum that will be available for use by teachers around the world. This program will challenge students and the public to make wise choices that benefit society by applying their knowledge to real-world climate scenarios and questions that scientists face every day. For more information, visit www.jason.org.

NOAA G-IV aircraft

NOAA G-IV AIRCRAFT DISPATCHED TO GATHER WINTER STORM DATA

NOAA's Gulfstream IV-SP aircraft conducted 46 flights over the North Pacific Ocean to fill gaps in existing atmospheric observations. NOAA crew flew 310.8 hours, covering 134,000 nautical miles, and launched 634 GPS dropwindsondes, of which 97.2 percent provided substantial, detailed data on 12 intensifying winter storms. Flying out of Yokota Air Force Base in Japan, the Office of Marine and Aviation Operations-operated plane collected wind speed and direction, air pressure, temperature, and humidity information from data-sparse regions. The data was sent via satellite to global operational weather forecasting centers and fed into sophisticated computer forecast models.

NOAA ship *Bell M. Shimada*

NOAA COMMISSIONED THE NOAA SHIP BELL M. SHIMADA

NOAA commissioned the *Bell M. Shimada*, the fourth of a new class of fisheries survey vessels on August 25, 2010. The ship's primary mission will be to study, monitor, and collect data on a wide range of sea life and ocean conditions, primarily off the West Coast. The 208-foot vessel will also observe environmental conditions; conduct habitat assessments; and survey fish, marine mammal, sea turtle, and marine bird populations. The ship's state-of-the-art design allows for quieter operation and movement of the vessel through the water, giving scientists the ability to study fish and marine mammals without significantly altering their behavior.

NOAA GPRA PERFORMANCE RESULTS

NOAA's mission goals in scientific knowledge, weather, water and climate, fisheries, and coastal communities are integrated from a funding and organizational perspective, in order to maximize support for the Departmental themes of Science and Information and Environmental Stewardship. In FY 2010 NOAA had 31 Government Performance & Results Act (GPRA) measure targets. Of these, NOAA achieved or exceeded targets for 25 of 31 measures, or 81 percent of the targets. The funding requested in this budget is essential for employing new and modified measures to better represent and assess NOAA's performance in achieving our mission.

In FY 2010, NOAA continued to improve the fish stock sustainability index (FSSI), its comprehensive measure for sustainability of 230 U.S. fish stocks selected for their importance to commercial and recreational fisheries. NOAA rebuilt the following four fish stocks to optimal population levels: North Atlantic swordfish, Georges Bank haddock, Atlantic coast spiny dogfish, and St. Matthews Island blue king crab.

During a five-day period in early February 2010, two snowstorms of historic proportions struck the Mid-Atlantic region. NOAA issued accurate outlooks for the storms three days in advance with an unprecedented forecast of 20-30 inches before the first flakes were observed. NOAA's winter storm warnings were an average of 30 hours ahead of the first snow fall, nearly double NOAA's national goal for winter storms. For FY 2010, NOAA exceeded the winter storm warnings lead time GPRA measure with an average of 21 hours, compared to the target of 15 hours.

NOAA's GPRA goals are focused on the results of key programs and services, support decision-making and congressional oversight, and are designed to measure and improve the performance of NOAA in meeting its mission. GPRA is unique in its requirement that agency results be integrated into the budgetary decision-making process. NOAA is continuously striving to improve its measures to better the service it provides to the American public. For more information on NOAA's FY 2010 performance, please refer to the Department of Commerce FY 2010 Performance and Accountability Report (PAR), located at: http://www.osec.doc.gov/bmi/budget/FY10PAR.html. Results reported here are actuals and may be slightly different in the FY 2010 PAR, which reported estimates at the time of publication.

NOAA PERFORMANCE SUMMARY FOR FY2010

GOAL	MEASURE	FY2010 TARGET	FY2010 ACTUAL	STATUS
ECOYSTEMS	Fish Stock Sustainability Index (FSSI)	580	582.5	
	Percentage of priority fish stocks with adequate population assessments and forecasts	57.4%	57.4%	
	Percentage of protected species with adequate population assessments and forecasts	20.1%	20.1%	
	Number of protected species designated as threatened, endangered, or depleted with stable or increasing population levels	25	29	
	Number of habitat acres restored	8,875	6,907	
	Annual number of coastal, marine, and Great Lakes ecological characterizations that meet management needs	50	48	
	Cummulative number of coastal, marine, and Great Lakes issue-based forecasting capabailities developed and used for management	42	42	
	Percentage of tools, tecnologies, and information services that are used by NOAA partners/ customers to improve ecosystem based management	86%	88%	
	Annual number of coastal, marine, and Great Lakes habitat acres acquired or designated for long-term protection	2,000*	21,341	
CLIMATE	U.S. Temperature Forecasts (Cumulative Skill Score computed over the regions where predictions are made)	24	18	
	Reduce the Uncertainty in the Magnitude of the North American Carbon Uptake	0.40 GtC/yr	0.40 GtC/yr	
	Reduce the Uncertainty in Model Simulations of the Influence of Aerosols on Climate	15% Improvement	18% Improvement	
	Reduce the Error in Global Measurement of Sea Surface Temperature	0.53°C	0.53°C	
	Regionally focused climate impacts and adaptation studies communicated to decision makers	41 risk assessments / evaluations	41 risk assessments / evaluations	

Key To Color Coding: Exceeded Target | Met Target | Slightly Below Target | Did Not Meet Target

1 The Annual Performance Plan targets for this measure represent the number of acres acquired or designated for long-term conservation in a given year. In the President's Budget, however, the targets represent the number of acres that are estimated to be acquired or designated with the expected funding appropriated for that year, although the actual acquisition or designation may occur in a later year.

NOAA PERFORMANCE SUMMARY FOR FY2010

GOAL	MEASURE	FY2010 TARGET	FY2010 ACTUAL	STATUS
WEATHER & WATER	Percentage of U.S. coastal states and territories demonstrating 20% or more annual improvements in resilience capacity to weather and climate hazards (%/year)	29%	29%	
	Severe weather warnings for tornadoes (storm based)—Lead time (minutes)	12	14	
	Severe weather warnings for tornadoes (storm based)—Accuracy (%)	70%	74%	
	Severe weather warnings for tornadoes (storm based)—False Alarm Rate (%)	72%	74%	
	Lead time (min) for severe weather warnings for flash floods	38	76	
	Accuracy (%) for severe weather warnings for flash floods	72%	82%	
	Hurricane forecast track error (48 hour) (nautical miles)	107	89	
	Hurricane forecast intensity error (48 hour) (difference in knots)	13	15	
	Accuracy (%) (threat score) of day 1 precipitation forecasts	30%	35%	
	Winter storm warnings—Lead time (hours)	15	21	
	Winter storm warnings—Accuracy (%)	90%	90%	
COMMERCE & TRANSPORTATION	Reduce the hydrographic survey backlog within navigationally significant areas (square nautical miles surveyed per year)	5,160	4,395	
	Percentage of U.S. counties rated as fully enabled or substantially enabled with accurate positioning capacity	74%	79%	
	Marine wind speed accuracy (%)	69%	74%	
	Marine wave height accuracy (%)	74%	75%	
	Aviation forecast accuracy of ceiling/visibility (3 mile/1,000 feet or less) (%)	65%	66%	
	Aviation forecast False Alarm Rate (3 mile/1,000 feet or less) (%)	42%	36%	

Key To Color Coding: Exceeded Target | Met Target | Slightly Below Target | Did Not Meet Target