

Living Marine Resources

The U.S. Commission of Fish and Fisheries became, in 1871, America's first federal conservation agency. But U.S. involvement lay deeper, in the 1783 Treaty of Paris and 1822 Treaty of Ghent that granted fishing rights to U.S. fishermen, and in the writings of Thomas Jefferson and others about the federal interest in fisheries. Since its founding, the Commission's name changed to the Bureau of Fisheries, then the Bureau of Commercial Fisheries, and finally,



19th century fishermen bail menhaden from a purse seine into a steamer's hold. From a sketch by J.S. Ryder in "The Fisheries and Fishery Industries of the United States, 1887." Credit: NOAA Library.

in 1971, the National Marine Fisheries Service—also called NOAA Fisheries Service. Other NOAA organizations—the National Ocean Service, and Oceanic and Atmospheric Research—also provide important research and public education on America's living marine resources.

These three NOAA organizations work cooperatively to ensure healthy and productive coastal and marine ecosystems. The NOAA Fisheries Service Ecosystem Observations Program collects, manages and disseminates data on the status of living marine resources to provide managers with information for informed decisions; the agency's effectiveness can be traced to a long history of alliances with the Regional Fishery Management Councils; Interstate Marine Fisheries Commissions; other federal, state, and tribal governments; industry; academia; and non-governmental organizations. NOAA Fisheries and the National Ocean Service work jointly to protect and restore habitat and coral.

dates require a broad array of activities: information on fishery stocks (and protected resources that are sometimes taken by fishermen); development of fishery management and enforcement measures; coastal fishery habitat protection; and development of marine aquaculture. The work results in a massive amount of resource survey data; plans and regulations for more than 200 fishery stocks and almost as many stocks of marine mammals and sea turtles; fishery licenses and permits; shipboard observer data; consultations for protected resources and coastal habitats; enforcement patrols and investigations; habitat restoration; conservation fishing gear development; seafood safety research and monitoring; and public education and outreach. The outcome? Coastal economies strengthened as stringent new regulations help recover depleted fish stocks and reduce bycatch. Increased recreational opportunities for millions of anglers and boaters. Thousands of habitat acres conserved or restored. A host of marine mammals and other protected resources that are beginning to flourish. And, each year, more coastal communities that incorporate ecosystem and sustainable development principles into their planning and management. ■

Reefs—the Ocean Service is also responsible for the 13 National Marine Sanctuaries, National Estuarine Research Reserves, and National Hazards Assessment. Both agencies also collaborate with NOAA's Oceanic and Atmo-



Salmon conservation is a top priority of the Fisheries Service. Credit: NOAA Fisheries Service.

spheric Research (which manages the National Sea Grant Program, Undersea Research Program, and Joint Research Institutes) to study the effects of climate on marine ecosystems.

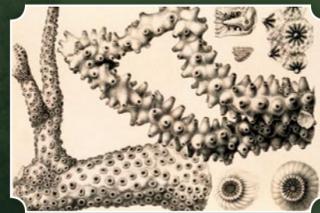
Major conservation laws guiding NOAA are the Magnuson-Stevens Fishery Conservation and Management Act, Marine Mammal Protection Act, Endangered Species Act, and National Environmental Protection Act. Such complex man-



A NOAA Fisheries Service Enforcement officer helps Gulf of Mexico fishermen understand fisheries laws. Credit: William B. Folsom, NOAA Fisheries Service.

Ocean and Coasts

The ocean was the focus of NOAA's oldest ancestor agency, and a need to better understand the ocean was a force in forming the Weather Bureau and the Bureau of Commercial Fisheries. But there are other ways in which NOAA and its predecessors have strong connections to the ocean, coasts, Great Lakes, and their resources.



A plate documenting some of the oldest studies of Florida Reefs. Credit: "Report on the Florida Reefs," 1880 by Louis Agassiz.

NOAA protects, preserves, manages, restores and enhances the nation's coastal resources and ecosystems along 95,000 miles of shoreline and 3.5 million square miles of coastal ocean. NOAA manages 13 national marine sanctuaries, the ocean equivalent of national parks, and the immense Northwestern Hawaiian Island area recently became a National



A black-necked stilt hunting for its dinner. Credit: NOAA National Estuarine Research Reserve Collection.

Monument, extending NOAA's responsibility for ocean oversight and stewardship. NOAA and partners study and conserve coral reefs, and develop and deploy technology to explore and map in all its dimensions, the largely unknown deep ocean.

Ocean exploration, research and programs support fisheries, discover submerged historic and cultural resources, build the economy through support for businesses such as biotechnology, and reduce impacts of aquatic invasive species. NOAA conducts research in 26 national estuarine research reserves, studies how human activities relate to coastal ecosystems, investigates the effects of pollutants on the marine environment and remediates oil and chemical spills. The National Sea Grant College Program engages 30 top universities and institutions in scientific research to better understand ocean, coastal, and Great Lakes resources. Supporting ocean

missions are NOAA satellites, divers, and the ships and Commissioned Officer's Corps in NOAA's Office of Marine and Aviation Operations.

In addition to sustaining fish stocks and charting for safe navigation and commerce, NOAA's ocean-related work has discovered marine animals with chemical compounds that promise new medicines, and mapping of the ocean floor will

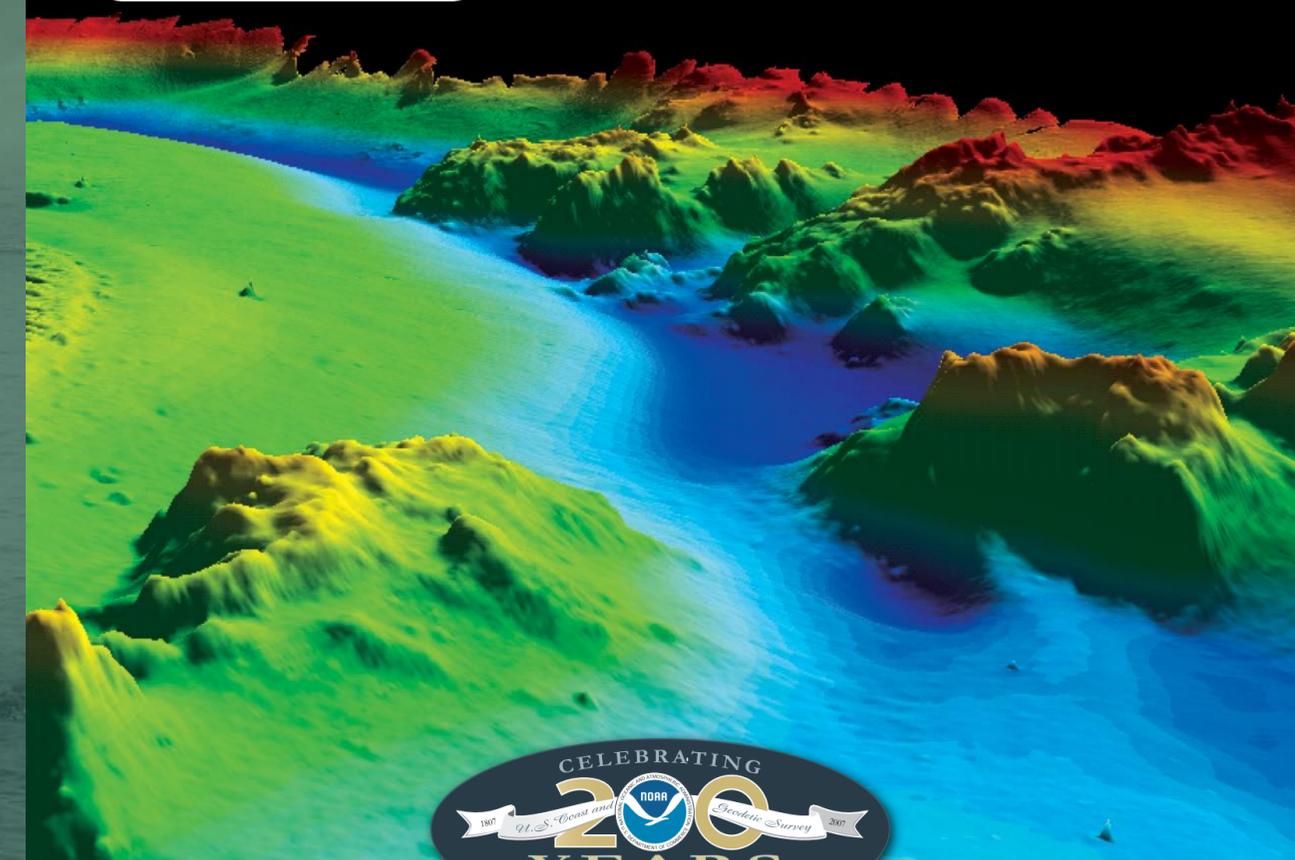
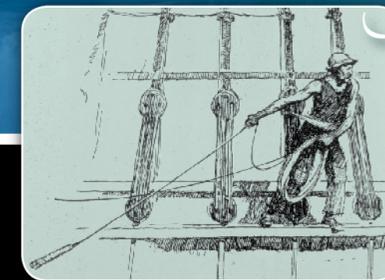
support possible future expansion of the U.S. Exclusive Economic Zone (EEZ) where potential resources valued at \$1.3 trillion are estimated to exist. Because most hurricane-related deaths are flood related, NOAA developed an important new tool to help emergency managers predict and track flood waters. NOAA research and programs counter Harmful Algal Blooms that cost the economy \$75 million annually, and the agency has recovered compensation for restoration at hazardous waste sites and coastal and marine resources injured from chemical releases and oil spills. NOAA researches how El Niño and other ocean-related changes affect climate, and an increasing number of ocean buoys record ocean data and changes for emergency response or for research. The agency certifies open and closed-circuit diving technologies for science applications, and NOAA's Aquarius, the world's only underwater laboratory, supports ocean science and the training of NASA astronauts. Ships, satellites, buoys, and other ocean sensors and systems support the Integrated Ocean Observing System, part of a larger system taking the pulse of our ocean planet. ■



The Institute for Exploration's undersea robot Hercules approaches a ghostly, white, carbonate spire in the Lost City hydrothermal field, 2,500 feet deep in the Atlantic Ocean. Credit: IFE, URI-IAO, UW, Lost City science party, and NOAA.

NOAA

Celebrating 200 Years of Science, Service, and Stewardship



For centuries, weighted lines were lowered by hand to measure ocean depth. Today, NOAA ships and underwater robots measure depth with hi-tech sonar. NOAA scientists turn the data into maps of the sea bed, like this image of the underwater world at the entrance to Portsmouth Harbor, New Hampshire. The data can be used for many purposes, including safe navigation, fisheries research, and flood evacuation planning. This image may be downloaded for free as a screen saver at: www.celebrating200years.noaa.gov

TOP LEFT: Sailor sounding from merchantman—19th century, sketch by Gordon Grant from Herbert Warden's "In Praise of Sailors."

Celebrate!



These amazing lightning images were taken during the STEPS Project. STEPS stands for Severe Thunderstorm Electrification and Precipitation Study. This project studied supercells on the high plains of Colorado and Kansas. May 25, 2000. Credit: National Weather Service Forecast Office Goodland, Kansas.

scientific heritage is rooted in NOAA, part of the Department of Commerce. NOAA plays a vital role in the life of every American, from weather forecasts, fisheries management, safe navigation, and coastal surveying to remote sensing, climate research, and ocean exploration.

We carry out our work within several NOAA organizations. The Coast Survey became the U.S. Coast and Geodetic Survey and is today part of National Ocean Service. America's 19th-century weather observation networks coalesced first into a service in the U.S. Army Signal Corps, and in 1891, into the civilian Weather Bureau—today's National Weather Service. The National Marine Fisheries Service grew from the U.S. Fish and Fisheries Commission, established in 1871. And the creation of NOAA in 1970 also incorporated the Environmental Data Service, National Oceanographic Data Center, National Sea Grant programs, and other activities into the Office of Oceanic and Atmospheric Research.

No single document can tell the whole story of the dedicated people, historic events and scientific breakthroughs that have shaped NOAA. This brochure highlights some of this rich history. For more about our foundation organizations, their current roles and activities, and how NOAA affects your life in positive ways, visit www.celebrating200years.noaa.gov.



LEFT PHOTO: NOAA hydrographic survey launch off the RAINIER in front of Sawyer Glacier, Alaska. Credit: NOAA.

You're invited to help us celebrate 200 years of science, service and stewardship to the nation. We're the men and women of NOAA, the National Oceanic and Atmospheric Administration, the federal agency charged with understanding and predicting changes in the Earth's environment, and managing America's ocean resources. Starting with Thomas Jefferson's establishment of the Coast Survey in 1807, much of this country's

scientific heritage is rooted in NOAA, part of the Department of Commerce. NOAA plays a vital role in the life of every American, from weather forecasts, fisheries management, safe navigation, and coastal surveying to remote sensing, climate research, and ocean exploration. We carry out our work within several NOAA organizations. The Coast Survey became the U.S. Coast and Geodetic Survey and is today part of National Ocean Service. America's 19th-century weather observation networks coalesced first into a service in the U.S. Army Signal Corps, and in 1891, into the civilian Weather Bureau—today's National Weather Service. The National Marine Fisheries Service grew from the U.S. Fish and Fisheries Commission, established in 1871. And the creation of NOAA in 1970 also incorporated the Environmental Data Service, National Oceanographic Data Center, National Sea Grant programs, and other activities into the Office of Oceanic and Atmospheric Research.

NASA's weather satellite system is now part of NOAA's National Environmental Satellite, Data, and Information Service. And our service is growing as NOAA works with many federal partners and more than 60 countries on the Global Earth Observation System, a vast network to monitor and predict Earth's changes.

We hope you'll share our pride in NOAA. Our agency plays a pivotal role in the U.S. economy, providing products and services that affect 30 percent of the nation's gross domestic product every year. The waterborne cargo relying on NOAA and for safe navigation contributes over \$1 trillion annually in revenues; the fishing industry adds another \$30 billion each year to America's economy, and ocean research creates billions in new products and discoveries. As for our weather and climate services, the value of lives and property saved through NOAA's timely forecasts and warnings is beyond calculation. We at NOAA take pride in our job: providing vital support to domestic security and global competitiveness, and enhancing the quality of life for our fellow citizens. ■



By the 1980's NMFS gear specialists had developed a cost-effective Turtle Excluder Device (TED) for trawl nets. Credit: NOAA Fisheries Service.



Brain coral and sea fan close-up. Credit: William Harrigan, Florida Keys National Marine Sanctuary Photo Contest entry.

Surveys and Commerce

Our 200 years of history begins in 1807 when President Thomas Jefferson signed an Act "to provide for surveying the coasts of the United States." The fledgling nation's success depended on efficient maritime commerce and border defense, and the tools to succeed were accurate charts of shores, waters and hazards to safe navigation. Thus was born America's first science agency — the Coast Survey — and a tradition of perseverance, scientific integrity, skill bordering on art, and the courage demanded of explorers charting the unknown. Later renamed the U.S. Coast and Geodetic Survey, this agency was among the first incorporated into today's NOAA.



Coast and Geodetic Survey crew uses a plane table to map shoreline in Southeast Alaska circa 1921. Credit: NOAA.



Tug boat moving container ship loaded with goods for U.S. markets, Chesapeake and Delaware Canal. Credit: NOAA.

Today, waterborne commerce remains the backbone of the U.S. economy, contributing over 13 million jobs and \$1 trillion annually. The marine transportation system moves over 95 percent of U.S. foreign trade tonnage each year, along with two thirds of everything Americans buy, eat and wear. Commercial shipping, fisheries, recreational boating, tourism, national defense, emergency responders, and coastal management rely on NOAA's nautical charts, tides and currents data, and an accurate geodetic positioning framework.

Though the methods have changed over time, NOAA's navigation services continue to benefit safety, national

security and economic competitiveness. The nation's ports, harbors, and waterways are highways for commerce, resources for recreation, and places of scenic beauty. Reducing risk of accident boosts the U.S. economy by preventing the consequences of a grounding or oil spill—response and recovery costs, delays to other vessels and cargo, port shutdowns, and damage to the environment. Debris left in Gulf waters after the 2005

hurricanes is a stark reminder of the changing hazards facing mariners navigating between U.S. ports, and the importance of accurate NOAA hydrographic surveys, nautical charts and real-time water level and positioning data. As ships grow in size and number, and waterway congestion increases, NOAA's information about the uncertain environment in which mariners must operate becomes ever more critical.

Where 200 years ago sailors tossed leadlines overboard to measure water depth, and location was determined by observing the stars, NOAA now uses multibeam and side scan sonar technology to fully map the sea bottom, Global Positioning System satellites for centimeter-accuracy positioning, tide stations that report water levels every six minutes, and advanced computers for compiling data into electronic nautical charts and other useful products. The Coast and Geodetic Survey's pursuit of excellence in charting the nation's shoreline and waters for safe and



NOAA Hydrographic Survey vessel RAINIER offloading a launch in preparation to survey, Auks Bay, Southeast Alaska. Credit: NOAA.

Weather and Climate

At the time of the first federal coastal surveys in 1807, Americans were already careful observers of country's climate and weather patterns. For example, George Washington and Thomas Jefferson recorded the daily weather. Telegraph operations in 1845 made it possible to transmit weather data, leading to President Grant's authorization of a national weather agency under the Army Signal Service. Today's National Weather Service is the largest single component of NOAA, providing weather, hydrologic, and climate forecasts and warnings for the United States, its territories, and adjacent ocean waters that protect life, property, and the nation's economy.



At a cooperative weather station in Granger, Utah, a volunteer observes temperature, precipitation, sky conditions, etc. Circa 1930. Credit: NOAA.

high-speed communications systems compile this data for timely dissemination to the public.

NOAA Research in technologies such as phased array radar, dual polar radar, and unmanned aircraft systems will provide forecasters with better views of existing conditions, while further development of numerical prediction models will increase accuracy of weather and air quality forecasts.

NOAA also studies and predicts changes from climate patterns.

Weather changes can occur quickly, but climate varies from year to year, decade to decade, and even across centuries. Changes in the atmosphere, oceans, ice sheets, land, and life forms are studied. The Climate Program Office coordinates climate research across NOAA and its partner organizations providing reliable and accurate information on the Earth's changing climate.



Operations area, National Weather Service Forecast Office in Key West, Florida as spiral bands from Hurricane Charley spread over the Florida Keys. August 13, 2004. Credit: Jim W. Lee.

The Weather Service is the official U.S. voice for watches and warnings during life-threatening weather conditions. From 122 weather forecast offices, 13 river forecast centers, nine national centers, and other support offices, 4,700 employees gather and analyze global data from land, sea,

and atmospheric sources. The Service uses an array of satellites operated by NOAA's National Environmental Satellite, Data, and Information Service, including the powerful Geostationary Orbital Earth Satellites that orbit 22,500 miles above the Earth. NOAA's network of 140 high-powered Doppler radars blanket America and its territories, providing meteorologists with the lead time for warnings to save lives and minimize property loss. Information is also gathered from marine data buoys, surface observing systems, and instruments that monitor space weather and air quality. Complex models and

The National Weather Service is achieving its vision of providing the world's best weather and climate information by delivering consistently reliable and accurate forecasts that greatly reduce weather and water-related injuries and fatalities. NOAA Weather Radio All Hazards is a nationwide network of more than 950 radio stations broadcasting continuous weather information directly from local NWS offices. NOAA Weather Radio also broadcasts warning and post-event information for other hazards, including earthquakes, avalanches, environmental accidents, AMBER alerts and 911 telephone outages.

Information from the National Weather Service touches our lives every day. ■



GOES-12 satellite imagery of Hurricane Katrina over the Gulf of Mexico at peak intensity of 175 mph. August 28, 2005. Credit: NOAA.