

EARTH SYSTEM MONITOR



**A guide to
NOAA's data and
information
services**

INSIDE

2
Letter from the
NODC Director

4
Ending Overfishing
and Rebuilding Fish
Stocks

5
Do Silent Ships See
More Fish?

7
New Vessel Regula-
tions and Measures
to Protect Endan-
gered Right Whales

8
News Briefs

10
Surfers Clean Puerto
Rico's Beaches

12
NOAA's FishWatch
Provides Science-
based Information for
Seafood Consumers



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

NOAA Fisheries Supports Healthy Marine Ecosystems

James Balsiger, Ph. D., Acting Assistant Administrator for Fisheries



In a world of expanding commercial and recreational activity, and increasing demand for seafood, NOAA Fisheries Service vision is that the American people continue to enjoy the benefits of healthy and diverse ecosystems. Along the coast and in the open ocean, our scientists and

resource managers work to ensure the conservation, protection, and sustainability of living marine resources for use by current and future generations.

Scientific Research in Support of our Mission

NOAA Fisheries Service scientific research supports the key components of our mission: sustainable fisheries, protected resources, and habitat conservation. Ongoing scientific activities include data collection, stock assessments to evaluate the abundance of individual populations of fish and marine mammals, and ecosystem modeling. In fiscal year (FY) 2008, we conducted a total of 117 fisheries stock assessments. Another important area of research is fishing gear technology: the development of fishing gear adaptations to improve efficiency, avoid bycatch of species that are not targeted, and minimize impacts to seafloor habitat. Cooperative research with external partners, including individual fishermen, is an important part of our scientific program. We are also working to revamp saltwater angler surveys and create a national angler registry called the Marine Recreational Information Program. This initiative will improve the collection, analysis, and application of fishing data, while giving anglers better representation in the decision-making process.

A growing consideration in much of our scientific work is the effect of climate change and ocean acidification. Climate change upsets the balance of the oceans through increasing water temperatures, melting sea ice, and ocean

acidification. Warmer waters are causing coral bleaching in the Caribbean, leaving more species vulnerable to disease. Summer sea ice in the North Pacific is declining faster than predicted, affecting commercially important fish, invertebrates, and marine mammals. Absorption of large amounts of CO₂ increases the acidity of seawater, causing mollusk shells to disintegrate and creating a ripple effect within the ecosystem. In response to these trends, NOAA Fisheries Service and the National Science Foundation have commissioned the first comprehensive national study of how CO₂ emissions may be altering the biology and chemistry of the marine environment.

Service to the Public

NOAA has clearly signaled our commitment to strengthening our economy and environment, two goals that are interconnected. Through the American Recovery and Reinvestment Act, NOAA is funding 50 habitat restoration projects around the country that will support jobs and industries in local economies, and restore important habitat for coastal and marine resources such as endangered species. NOAA ran a competitive solicitation process for projects that would provide economic benefits by creating jobs, have high ecological value and benefit for NOAA's mission, and that were shovel-ready.

The 50 projects were chosen from a pool of 814 proposals totaling more than \$3 billion in requests. The agency worked through a rigorous selection process to identify and prioritize projects meeting the Recovery Act's criteria. Many of these 50 projects — in 22 states and two territories — are in areas with some of the highest unemployment rates, including the states of California, Oregon, and Michigan. The projects will employ a range of skills including laborers, nursery workers, design engineers, restoration ecologists, landscape architects, hydrologists, and specialized botanists. When complete, the projects will have restored more than 8,900 acres of habitat and removed obsolete and unsafe dams that open more than 700 stream miles where fish migrate and spawn. The projects also will remove more than 850 metric tons of debris, rebuild oyster and other shellfish habitat, and reduce threats to 11,750 acres of coral reefs.

(continued on page 3)

Letter from the NODC Director



▲ Margarita Conkright Gregg, Ph.D.

On June 12, President Barack Obama proclaimed June 2009 as National Oceans Month. He called on Americans to learn more about the key role our oceans play in our Nation's economy, transportation, food, recreation, and energy resources. This declaration was followed by the establishment of an Interagency Ocean Policy Task Force, tasked with developing a national policy for oceans, coasts, and the Great Lakes, and providing a framework for planning for the multiples uses of marine resources. NOAA Administrator Dr. Jane Lubchenco announced the creation of this task force, and NOAA's participation in it, based on our "exceptional range of expertise and scientific capabilities to contribute to this high-level initiative of national importance." This issue of the Earth System Monitor (ESM) clearly illustrates how NOAA's expertise and unique role in stewarding our oceans can contribute to this high level task force.

The National Oceanographic Data Center (NODC), aligned with the NOAA Ecosystems Goal, is engaged in many of the activities described in this issue. As the archive for the Nation's ocean data, NODC preserves the data from some fisheries-related projects such as the Fisheries-Oceanography Coordinated Investigations (FOCI) in the Gulf of Alaska and Bering Sea. This long-term monitoring project is investigating the effects of climate variability and change on fisheries productivity. This project illustrates the critical function of the archives in preserving data and providing the retrospective data needed to assess changes in the oceans.

In close partnership with NOAA Fisheries Service, NODC is developing tools that enable the discovery and management of fisheries data and information. Some examples include:

- The Regional Ecosystem Data Management (REDM) portal that ensures core data variables for an Integrated Ecosystem Assessment (IEA) are available to scientists in common formats via a web-based portal
- The Ecosystem Data Assembly Center's (EDAC's) development of an information technology infrastructure to support ecosystem observations and related data collected in the Gulf of Mexico
- Hypoxia Watch's use of near-real-time shipboard measurements of bottom dissolved oxygen to create products that show anoxic and hypoxic conditions in the western and north-central Gulf of Mexico.

In past ESM issues, we focused on the role of NOAA in stewarding our Nation's ocean, climate, and geophysical data and information. In this issue, we focus on how NOAA provides Science, Service and Stewardship to support healthy marine ecosystems. NOAA's National Marine Fisheries Service is committed to "the conservation, protection, and sustainability of living marine resources for use by current and future generations." Dr. James Balsiger, Acting Assistant Administrator for Fisheries, introduces this issue with a description of how NOAA Fisheries Service serves the Nation in areas such as assessing fish stocks, understanding the impact of climate change on U.S. marine ecosystems, creating new jobs through projects supporting habitat restoration, and protecting our marine ecosystems. Articles in this issue provide further detail of the NOAA Fisheries Service mission on topics like overfishing, climate and ecosystems, protected resources, and habitat restoration.

We at NODC and the NOAA Satellite and Information Service welcome your feedback and recommendations on any aspect of our data center. I hope you enjoy the articles in this issue of the Earth System Monitor. ■

Margarita

EARTH SYSTEM MONITOR

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U.S. DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

(NOAA Fisheries Service continued from page 1)

Through a wide range of partnerships, we seek to increase public awareness and involvement in the stewardship of marine ecosystems. For example, NOAA Fisheries Service is a strong proponent of science-based outreach and is partnering with museums across the country to deliver messages through *Science on a Sphere* that advance NOAA's educational goal of an environmentally literate public supported by lifelong formal and informal education.

NOAA Fisheries Service Office of Law Enforcement supports all aspects of our mission through activities such as patrols and investigations, both domestic and international, and vessel boardings to enforce compliance with safety and conservation regulations. Fish processing plants are inspected regularly to ensure consumer measures. As part of our enforcement efforts, we are also making significant progress in combating the fraudulent mislabeling of seafood products. Through cooperation with the Federal Bureau of Investigation, Customs, and the Food and Drug Administration, NOAA Fisheries Service seized thousands of pounds of falsely labeled seafood in 2008, and successfully indicted or convicted many individuals involved in these illegal activities.

Actions to Promote Stewardship and Sustainability

NOAA Fisheries Service protects marine mammals and threatened and endangered species under its jurisdiction, including whales, dolphins, invertebrates, sea lions, turtles, sea birds, staghorn and elkhorn corals, and several species of salmon and sturgeon. Many are affected by habitat degradation, poor water quality, and human interactions, as well as environmental changes. Currently, 68 populations are listed under the Endangered Species Act, and 62 mammal species are protected under the Marine Mammal Protection Act; our goal is to increase the number of protected species that have stable or increasing populations. An array of innovative programs—recovery plans, a ship strike strategy to protect large whales, stranding networks, and rehabilitation efforts—are making fishing operations and commerce safer for marine wildlife. We also prepare biological opinions on a broad range of Federal actions (e.g., hydropower projects, Navy training operations, and mineral extraction) to help other agencies minimize adverse effects on endangered species while they conduct essential business.

Another top priority is to continue rebuilding our fisheries and the vibrant fishing communities they support. U.S. commercial and recreational fishing generated more than \$185 billion in sales and supported more than two million jobs in 2006, the most recent year for which statistics are available.

NOAA Fisheries Service is working with the regional fishery management councils to end overfishing, as required by the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006. The fishery management council system was established by Congress in 1976 to manage fisheries in the exclusive economic zone between 3 and 200 miles off the U.S. coastline. The eight regional fishery management councils are decision-making bodies that develop and recommend to NOAA Fisheries Service fishery management plans and amendments. Council members include individuals with experience, scientific expertise, training, and knowledge regarding the conservation, management, or harvest of fishery resources.

Together, NOAA Fisheries Service and the councils are working to establish strict annual limits on the total harvest in every U.S. fishery and accountability measures that kick in when these limits are exceeded. NOAA has also created a Catch Shares Task Force to explore options for expanding programs that allow fisherman to catch their allotted shares when weather and business conditions are favorable. We are committed to securing a steady regional seafood supply and to keeping American fishermen working. As aquaculture continues to expand as an important source of the world's protein, it's NOAA's job to ensure that U.S. offshore aquaculture operations are environmentally sound, sustainable, and provide maximum benefits to the Nation.

Beyond our borders, NOAA Fisheries Service works with many other nations to promote ecosystem-based management and equitable access to shared living marine resources that cross international boundaries. There is a major effort underway to shut down sources of illegal, unregulated, and unreported fishing on the high seas. We are also working with developing nations to share technology that will help improve their enforcement and scientific capabilities. As we adapt to changing environmental circumstances and new management challenges, here in the United States and around the world, NOAA Fisheries Service will continue to make the long-term sustainability of marine ecosystems our highest priority. ■

▲ NOAA researchers study juvenile salmonids using Passive Integrated Transponder (PIT) tag technology in the Columbia River estuary.

Photo courtesy of: Dick Ledgerwood

Ending Overfishing and Rebuilding Fish Stocks

Rachel O'Malley, Office of Sustainable Fisheries, Partnerships and Communications Division

Photo courtesy of Jim Peacock



Americans consumed nearly five billion pounds of seafood in 2007. With a growing global demand for seafood, it is a priority for NOAA Fisheries Service to end overfishing and return overfished stocks to sustainable levels. U.S. commercial fishing industries—seafood harvesters, processors, dealers, wholesalers, and retailers—generate \$103 billion in annual sales, \$44 billion in annual income, and support 1.5 million jobs. Recreational fishing generates an annual \$82 billion in sales, \$24 billion in income, and supports 534,000 jobs in the United States. And, looking at the larger picture, fish also have inherent value as a critical part of marine ecosystems. With much at stake, new legal requirements and innovative management tools are changing the nature of fishery management.

The primary authority for fishery management in the United States is the Magnuson-Stevens Fishery Conservation and Management Act. This Act was reauthorized in 2006, with new provisions that include a strict timetable for ending overfishing. The law recognizes annual catch limits (species-specific quotas) as the primary conservation tool for achieving the goal of sustainable fisheries. By law, NOAA must adopt annual catch limits by 2010 for stocks that are subject to overfishing and by 2011 for other stocks. Some flexibility exists for stocks that are managed by international agreement. Currently, overfishing is occurring on 41 stocks,

mostly in the Atlantic Ocean and the Gulf of Mexico. In January 2009, NOAA Fisheries finalized guidance that calls for strong accountability measures to prevent annual catch limits from being exceeded and to address any overharvests quickly.

Another important factor in fishery management is catch shares. These are sectors, cooperatives, limited access privilege programs, and individual fishing quotas that provide dedicated access to eligible fishermen and businesses. The United States now has 12 catch share programs in place, which account for nearly 20% of U.S. landings by value. These programs offer flexibility, allowing captains to control

when and how they fish for their share of the quota. As a result, top-quality seafood can be available to meet market demand. Participants have seen higher profits, lower costs, and longer fishing seasons. Recent scientific analyses have shown that fisheries managed with catch shares are more stable and productive. They can also help maintain and restore the health of marine ecosystems and support local fishing communities.

Ending overfishing is just the first step in the process of rebuilding an individual stock. It can take years for a fish population to respond and reproduce to a level that supports the maximum sustainable yield. NOAA scientists are constantly evaluating progress toward this goal through individual stock assessments. Every year, NOAA submits a report to Congress on the Status of U.S. Fisheries. In the most recent report, released in May 2009, NOAA announced that four stocks—Atlantic bluefish, Gulf of Mexico king mackerel, and two stocks of monkfish in the Atlantic—have been fully rebuilt. This is the largest number of stocks to be declared rebuilt in a single year since NOAA declared the first stock successfully rebuilt in 2001. In total, 77% of U.S. stocks are not considered overfished. ■

You can monitor our progress by visiting www.nmfs.noaa.gov/msa2007 or www.nmfs.noaa.gov/fishwatch/

Do Silent Ships See More Fish?

Alex De Robertis, Midwater Assessment and Conservation Engineering Program, Alaska Fisheries Science Center

NOAA has built four new fisheries research vessels that have a specialized design intended to minimize low-frequency underwater radiated noise that fish can hear. Since fish are known to avoid approaching vessels, reducing this noise may increase the accuracy of stock assessment surveys. Accurate survey estimates are essential for appropriate management of commercial fisheries.

To test this new technology, NOAA's Alaska Fisheries Science Center (AFSC) compared surveys conducted by the first of these new vessels, the NOAA ship *Oscar Dyson*, to surveys conducted by a previous-generation ship, the NOAA ship *Miller Freeman*. The two ships simultaneously surveyed walleye pollock (*Theragra chalcogramma*) in Alaska, in order to discover whether the pollock avoided the two ships differently. Alaskan pollock is the largest commercial fishery in the United States. AFSC conducts regular acoustic surveys of pollock in four areas to support management of the fishery. These survey areas differ markedly in pollock depth distribution, age-structure, reproductive state, and environmental conditions, all of which may influence vessel avoidance responses.

These experiments compared acoustic estimates of abundance observed by *Oscar Dyson* and *Miller Freeman* during pollock assessment surveys in 2006-2008. In two experiments in the eastern Bering Sea where pollock were at depths less than 120 meters, the vessels observed statistically equivalent pollock densities. This was also the case for pollock at depths of 400-700 meters during a survey in the Bogoslof Island area. However, statistically significant differences were observed in surveys in the Shumagin Islands and Shelikof Strait. In the Shumagin Islands area, where pollock are found at depths of 100-200 meters, abundances observed by *Dyson* averaged 31% higher than those observed by *Freeman*.

In Shelikof, where pollock are found at depths of 200-300 meters, estimates from *Dyson* were 13% higher than those from *Freeman*.

In both areas where differences were observed, the discrepancies were greater for fish in shallower water, which is consistent with a stronger response by fish closer to the vessels. In addition, the observed depth of walleye pollock differed consistently between vessels. To verify these results, AFSC used an instrumented buoy to take measurements during vessel approach. When *Freeman* passed the buoy, a larger decrease in pollock abundance and a stronger diving response were observed compared to the more modest avoidance reaction associated with *Dyson*.

This study is the first explicit demonstration that noise-reduction can lessen vessel avoidance by fish. This indicates that investing in quieter fisheries survey vessels coupled with maintenance of low radiated noise—can improve fish survey estimates by reducing vessel avoidance. ■



▲ NOAA ships *Miller Freeman* (left) and *Oscar Dyson* (right) in Dutch Harbor, Alaska. Although the ships are of similar length, the *Dyson* has approximately 30% more displacement and approximately 40% more horsepower.

Incorporation of Climate Effects on Marine Ecosystems

Kenric Osgood, NOAA Fisheries, Office of Science and Technology; Franklin Schwing, NOAA Fisheries, Southwest Fisheries Science Center

Climate change affects all aspects of NOAA's living marine resource management efforts. To limit the social and economic impacts of climate change on the Nation, NOAA Fisheries Service provides the information required to adapt to changing climate conditions. This ensures that the recommendations from NOAA Fisheries Service management matches our evolving environmental conditions.

Climate change has significant impacts on marine ecosystems and the living marine resources that NOAA manages. Some of the major impacts include:

- **Ocean physical changes:** (e.g. changes in water temperature, stratification, currents, timing of coastal upwelling). These changes affect species' distributions, ocean productivity, and the timing of seasonal biological events.
- **Loss of sea ice:** Leads to reduced habitat for ice dependent species in the Arctic and Antarctic. It also changes the habitat and productivity for other species in polar regions.
- **Ocean acidification:** Caused by increased concentrations of carbon dioxide. Acidification decreases the availability of calcium carbonate in the oceans. The growth rate and viability of many marine species may be impacted by ocean acidification since they construct their shells or other structures (e.g. coral reefs) with calcium carbonate they obtain from seawater.
- **Sea-level rise:** Causes changes to and loss of coastal habitat, which is critical to many marine species.
- **Altered freshwater supply and quality:** Impacts coastal habitat influenced by freshwater input and affects spawning migrations and survival of species such as salmon.

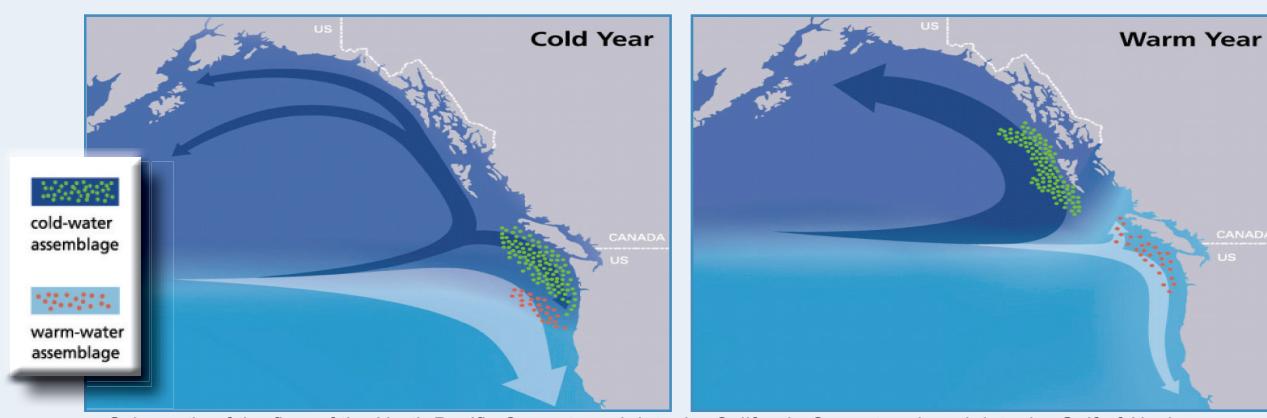
Data from NOAA Fisheries observation programs are being integrated with physical and ecological data from NOAA and its partners to provide a comprehensive view of the status of marine ecosystems, including how they relate to current

climatic conditions, and to living marine resource populations. These and other integrated products improve living marine resource population assessments and allowable catch recommendations. Climate information is also incorporated in determinations of critical habitat for living marine resources and considerations for endangered or threatened species.

In addition, NOAA Fisheries studies explore specific environmental mechanisms that influence living marine resources. Examples include the North Pacific Climate Regimes and Ecosystem Productivity (NPCREP) study and the fisheries oceanography program, Fisheries and the Environment (FATE). NPCREP enhances management and protection of Alaskan marine resources by providing applied research and decision making guidance for stakeholders. The NPCREP study focuses on how changing climate affects the growth, survival, and recruitment of Alaska's living marine resources. The project uses observations and studies to investigate the physical and biological controls on ecosystems and to learn how these factors are affected by climate variability and change.

The FATE program supports regional studies to develop and evaluate ecological and oceanographic indices to be used to improve fishery stock assessments and advance understanding of marine ecosystem dynamics. FATE investigators incorporate indices and functional relationships into stock and ecosystem assessments to improve forecasts of the implications of environmental change and fishing on the current and future status of living marine resources.

While much remains to be accomplished, these programs and activities provide the building blocks for NOAA's efforts to understand and ultimately forecast the impacts of climate change on the populations and ecosystems that NOAA Fisheries is required to manage. ■



New Regulations and Routing Measures to Protect Endangered Right Whales

Shannon Bettridge and Gregory K. Silber, Office of Protected Resources, NOAA Fisheries Service

With only 300 to 400 in existence, North Atlantic right whales are among the most endangered whales in the world. Their slow movements and the amount of time they spend at the surface and near the coast make them highly vulnerable to encounters with human activities, especially becoming entangled in commercial fishing gear or being struck by ships. Collisions with vessels are a significant threat to the recovery of North Atlantic right whales, causing serious injury or death to an average of about two right whales per year.

NOAA Fisheries Service began regulating commercial fishing to reduce whale entanglements in 1997, and has since developed regulatory and non-regulatory measures to prevent ship strikes. These include operational measures for vessels, education and outreach programs, technological research, and monitoring activities.

Vessel Speed Restrictions

Last fall, NOAA introduced new regulations (73 FR 60173, 10/10/08) to reduce the chances that ships will collide with whales. Studies indicate that both the likelihood of a ship strike and the severity of injury to a whale can be decreased by reducing vessel speeds. Based on scientific data and the immediate need to protect endangered right whales, NOAA established vessel speed restrictions of 10 knots or less in times and locations, also known as Seasonal Management Areas, of high whale and vessel densities along the eastern seaboard of the United States. Beginning December 9, 2008, all vessels 65 feet (19.8 m) or greater in overall length are subject to a 10-knot speed restriction in Seasonal Management Areas.

Exempted from the rule are U.S. Government vessels that are expected to adhere to guidance provided under Endangered Species Act Section 7 consultations and State vessels engaged in law enforcement or search and rescue activities. The rule also contains a provision exempting vessels from speed restrictions in hazardous sea and weather conditions, thereby ensuring safe vessel maneuverability under those special conditions.

In addition to the mandatory Seasonal Management Areas, NOAA may establish voluntary dynamic management areas when three or more right whales are concentrated in an area outside an active Seasonal Management Area. These areas are effective for 15 days unless extended. NOAA advises that mariners proceed at 10 knots or less through dynamic management areas or avoid them.

Vessel Routing Measures to Reduce Ship Strikes

In 2008, the United States submitted two proposals to the International Maritime Organization affecting large vessel routing to reduce the risk of ship strikes to North Atlantic right whales. The proposals were endorsed and became effective June 1, 2009.

One measure is the establishment of a seasonal “area to be avoided” in the Great South Channel off Massachusetts. The area to be avoided affects ships of 300 gross tons and above and is in effect each year from April 1 to July 31, during significant right whale aggregation in the area.

Second is a narrowing of the shipping lanes in the approach to Boston, Massachusetts, from two miles to a mile and a half, leaving the western boundary of the lanes and the width of the mile separation zone between the lanes unchanged. This amendment will move ships away from the greatest density of right whales and minimize overlap between whales and ships, while making the width of the north-south lanes consistent with the width as the east-west lanes. NOAA Fisheries Service estimates these measures will reduce the risk of right whale ship strikes in that area by 74% during April–July (63% from the area to be avoided and 11% from the narrowing of the shipping lanes).

The ship speed restriction rule and the new routing measures are part of NOAA’s broader ship strike reduction efforts. Other protective actions include: surveying whale aggregation areas by aircraft, mandatory ship reporting systems to provide advisories and information on whale locations to mariners, recommended shipping routes, mariner training, and education and outreach activities. ■

For more information on NOAA Fisheries’ ship strike reduction actions, visit: www.nmfs.noaa.gov/pr/shipstrike/.



News Briefs

New Ocean Current Data to Improve Search and Rescue Activities

A new set of ocean observing data that enhances the U.S. Coast Guard's ability to track probable paths of victims and drifting survivor crafts should improve search and rescue efforts along the Nation's coasts.

The data comes from the Integrated Ocean Observing System (IOOS), a joint effort between NOAA, the Mid-Atlantic Coastal Ocean Observing Regional Association, the Coast Guard, and the Department of Homeland Security.

IOOS measures speed and direction of ocean surface currents in near real time and provides surface maps from high frequency radar systems. The data will feed into Coast Guard servers to improve environmental observations for the agency's operational Search and Rescue Optimal Planning System, which allows 24-hour forecasts for sea surface currents.

The Coast Guard can use the data to guide its search and rescue operations with greater accuracy. The surface maps can also be used to support scientific work such as oil spill response, harmful algal bloom monitoring, and water quality assessments.

For more information about IOOS, visit ioos.noaa.gov.

Researchers Discover Blue Whales Returning to Former Migration Patterns

Blue whales have migrated from the coast of California to areas off British Columbia and the Gulf of Mexico for the first time since 1965, according to scientists.

In the scientific journal *Marine Mammal Science*, researchers from NOAA's Southwest Fisheries Sci-

ence Center in California, Cascadia Research Collective in Washington State, and Canada's Department of Fisheries and Oceans identified 15 cases of blue whale sightings off British Columbia and the Gulf of Alaska.

Four of the whales were identified as animals previously observed off the coast of California, suggesting a re-establishment of a historical migration pattern. Researchers made this identification by comparing photographs of blue whales taken in the North Pacific Ocean since 1997 with a library of almost two thousand photographs of blue whales off the West Coast.

While scientists are not certain why blue whales are now beginning to migrate from southern California to the North Pacific Ocean, changing ocean conditions may have shifted their primary food source of krill farther north.

Blue whales are listed as endangered under the federal Endangered Species Act. An estimated 5,000 to 12,000 animals remain today, with the largest population of approxi-

mately 2,000 inhabiting the waters off of the U.S. West Coast.

Online Handbook Helps Teachers Create Fishery Oral History Projects

Teachers and community groups can use a new online NOAA handbook to conduct oral history projects on the people, history, and culture of the Nation's coastal and Great Lakes fishing communities.

Visions from the Fisheries Handbook: Preserving Local Fisheries Knowledge, Linking Generations, and Improving Environmental Literacy, published in May 2009, details how to start fishery projects, build community partnerships, and integrate projects into existing curricula.

The idea for the handbook grew out of the Local Fisheries Knowledge Project, which NOAA Fisheries Service conducted in Ellsworth and Jonesport high schools in Maine from 2003 to 2006. NOAA worked with the Rural School and Community Trust and local educators to design an oral history cur-



▲ The blue whale is the largest animal on Earth, weighing over 330,000 pounds.

riculum for students who documented the fishing and maritime history of their Down East communities.

"Capturing the stories and experiences of local men and women who take part in commercial and recreational fishing and other marine-related occupations is especially important for young people growing up in these towns and cities," said Dr. Susan Abbott-Jamieson, senior social scientist with NOAA Fisheries Service and one of the handbook's three authors. "Through interviews with community residents, students explore the rich connections between fisheries, the marine environment, their community, and their own lives."

The handbook can be found online at www.voices.nmfs.noaa.gov.

NOAA Enacts Emergency Rule to Protect Threatened Sea Turtles

NOAA Fisheries Service is aiming to protect threatened loggerhead sea turtles in the Gulf of Mexico with a temporary emergency rule requiring the commercial reef fish longline fleet to operate at a distance farther off the coast.

The fleet must now fish seaward of a line approximating the 50-fathom contour in the Gulf of Mexico rather than the previous line at 20-fathoms. The 180-day rule took effect May 18, 2009, and can be extended for up to 186 additional days.

The Gulf of Mexico Fishery Management Council requested the rule after a NOAA observer study documented the fleet was incidentally catching and killing too many loggerhead turtles, which are listed as threatened under the Endangered Species Act. The area within the 50-fathom contour off the west Florida shelf, where most of the incidental bycatch occurred, contains important sea turtle feeding grounds.

"We are working closely with the



▲ A loggerhead sea turtle in the Gulf of Mexico.

council and constituents to find more permanent solutions to protect sea turtles affected by this fishing gear," said Roy Crabtree, NOAA's Fisheries Service southeast regional administrator. "I hope we can identify options that not only provide sea turtles the protection they need, but minimize the economic affects to the fishing industry."

The rule will primarily affect longline fishermen who target shallow-water grouper species, such as red grouper.

NOAA Proposes Federal Protection for Three Georgia Basin Rockfish Species

In April 2009, NOAA Fisheries Service proposed listing three populations of rockfish in Puget Sound and the Strait of Georgia for protection under the Federal Endangered Species Act.

The canary and yelloweye rockfish are proposed for "threatened" status, which is for species that are vulnerable to extinction in the near future. The

bocaccio rockfish is proposed for "endangered" status, which is for species at high risk of extinction.

All three rockfish species have been harvested at high levels in the Georgia Basin, which encompasses Puget Sound in Washington and the Strait of Georgia in Canada. Rockfish are vulnerable to overfishing because they are bottom dwellers, live long lives and mature and reproduce slowly.

If the three species are listed for Endangered Species Act protection, NOAA would initially focus on fishing practices in Puget Sound, where rockfish harvests are managed by the state. Commercial catch has been substantially restricted in the Sound since the early 1990s, but additional factors, including a small recreational harvest, unintentional catch by other fisheries, pollution, and loss of habitat are also affecting the population.

The agency is gathering further scientific information on the rockfish species, the reasons for their decline, and possible efforts to restore their numbers before it makes a final decision next year.

Surfers Clean up Puerto Rico's Beaches

Rachel Brittin, NOAA Restoration Program

It is amazing what you see when you spend several hours a day among the swells of the ocean—giant waves, passing whales, turtles, and schools of fish. For a group of surfers in Puerto Rico, what they saw along their beaches—garbage, debris, and old tires—quickly turned them into ocean-going activists.

Leon Richter, a California native living in Puerto Rico, spends most of his free time surfing off the coast of Rincón. When he is not busy catching waves, he is working with NOAA and a partner organization called the Surfrider Foundation, to help keep Puerto Rico's Tres Palmas Marine Reserve free of debris.

"I originally got involved in ocean conservation work when I got sick from a waterborne illness while surfing in California," said Richter. "I was hospitalized for weeks. When I recovered, a friend suggested I speak out on ocean health."

This eventually brought Richter and others to the Surfrider Foundation in Rincón, Puerto Rico, where they lead an effort, along with NOAA and many other organizations, to establish and restore the Tres Palmas Marine Reserve.

Over the last two decades, the small city of Rincón had evolved into a booming metropolis with a growing tourism industry. The coasts surrounding Rincon today are lined

with hotels and many housing units. As the population grows each year, more and more debris makes its way into the ocean.

"I continue to help restore these beaches because, as a regular surfer, I see firsthand how they can decline so quickly," said Richter. "It just takes one tire to topple coral or one storm to blow in garbage along miles of beach."

The Tres Palmas Marine Reserve is the first reserve established on the main island of Puerto Rico. Over the years, it has earned a global reputation for its giant waves, attracting surfers from all over the world. In 2000, NOAA, the Surfrider Foundation, and a number of other environmental groups were alerted by the Rincón community that Tres Palmas was threatened by the planned development of several housing and hotel structures. For more than eight years, the Rincón community campaigned tirelessly to protect Tres Palmas, and in 2006 NOAA began providing funds to help restore this treasure.

Tires in the Green Room

Ask any surfer and they will tell you that the term green room describes being inside the tubular shape of a wave. Now, imagine looking through this wave to view garbage and old tires in the sand and reef below.

The dumping of old tires has left a lasting mark on the coral living off the coast of Rincón, as well as on the people who live nearby. In two years, Richter and volunteers collected about 475 tires from Tres Palmas. This doesn't even include the engine blocks, old anchors, and clothing they have removed from the coral.

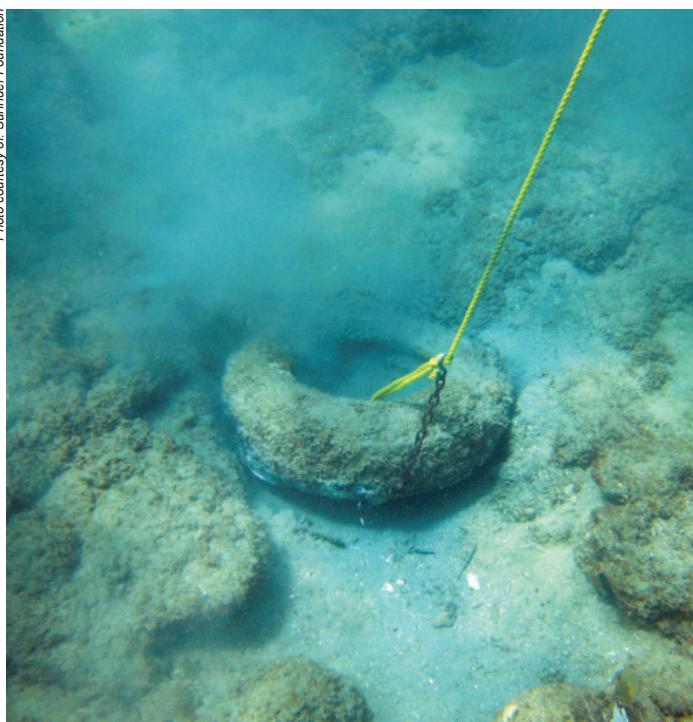
"Just one tire can decimate a lot of reef," said Richter. "Most people didn't know the tires were there and were shocked and outraged when they found out. The local citizens were moved to take action."

There are two known species of federally endangered Elkhorn and Staghorn corals in these waters, and Tres Palmas has some of the healthiest. With the exception of those damaged by old tires, the coral reefs near Tres Palmas stand a good chance for survival.

"It doesn't stop with surfers. Many of those helping to clean up and keep Tres Palmas healthy have never even surfed," says Richter. "There are many local community members involved, including fishermen, educators, students, and other citizens." ■

For more information on restoring coastal habitats visit:
<http://www.nmfs.noaa.gov/habitat/restoration/>

Photo courtesy of Surfrider Foundation



▲ An old tire being removed from a coral reef.



NOAA Fisheries Service
U.S. Department of Commerce/National Oceanic and Atmospheric Administration



NOAA's FishWatch Provides Science-based Information for Seafood Consumers

Katie Semon, Office of Sustainable Fisheries, Partnerships and Communications Division

Americans are eating more seafood and are increasingly concerned about its sustainability, nutritional benefits, and quality. These are complex issues, so consumers need a reliable resource to help them make informed decisions about the seafood they eat. There are several resources that offer opinions as to what seafood consumers should eat and not eat, but sometimes the information they provide is outdated, conflicting, or confusing. Presenting neutral, science-based information in a relevant, user-friendly manner is one of the best ways to help consumers make informed decisions about seafood.

In August 2007, NOAA Fisheries Service launched FishWatch, an online seafood consumer guide that delivers the most accurate and up-to-date facts on seafood harvested in the United States. FishWatch provides consumers with easy access to NOAA's wealth of information about seafood, including the latest on the status of U.S. fisheries, how they are managed, how fish are harvested, current science, and other helpful information. The site profiles more than 80 seafood species harvested in the United States, such as tuna, salmon, and cod. FishWatch also covers human health, including nutrition facts for each species, the health benefits of eating seafood, and safety guidelines for certain at-risk groups of seafood consumers. FishWatch averages over 1,600 web visits per day and has received widespread support from the general public, the commercial fishing industry, Government, non-government organizations, retailers, and aquariums. ■

Visit www.fishwatch.noaa.gov and get the facts about the seafood you eat.