NEWSWAVE

NEWS FROM THE U.S. DEPARTMENT OF THE INTERIOR: OCEANS, COASTS AND GREAT LAKES

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Spring 2014

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June is Oceans Month

On May 30th, the President proclaimed June as Oceans Month,

> *"Americans look to the oceans as natural treasures, a source of food and energy, and a foundation for our way of life. Our oceans, coasts, and Great Lakes provide jobs and attract tourism. They provide a habitat for scores of species. They are vital to our Nation's transportation, economy, and trade, linking us with countries across the globe and playing a role in our national security. This month, we reaffirm our responsibility to keep our oceans and coastal ecosystems healthy and resilient."*

See Oceans page 5

For every $1 invested in local projects by the USFWS Coastal Program, $6.86 is leveraged from local and private partners which created $12.78 in economic returns.

Coastal Restoration Pays Off

A new economic analysis from the U.S. Fish and Wildlife Service (USFWS) highlights the impact that restoring coastal and private lands can have on local economies.

See Restoration page 3

Interior strengthens the Nation's ability to weather the storm

By David Eisenhauer (USFWS) and Ann Tihansky (USGS)

As the 2014 hurricane season begins, Interior bureaus continue to heal the wounds of Sandy with a focus on ensuring our nation is more resilient to future storms.

"What we witnessed during Hurricane Sandy was that our public lands and other natural areas are often the best defense against Mother Nature," said Secretary Jewell last October (2013) as she announced funding plans for Interior's response to Sandy. "By stabilizing marshes and beaches, restoring wetlands, and

See Resilience page 4

Video: Sea-Level Rise in Everglades National Park

Managers at Florida Everglades National Park are witnessing the effects of rising sea level on mangrove forests, freshwater marshes, and century-old structures. See the changing landscape and what park stewards are doing to prepare. *https://www.youtube.com/watch?v=11kQE9Tc4zo*

Mangroves forests at Everglades National Park. Photo credit: NPS

Visit us online:
www.doi.gov/pmb/ocean/index.cfm

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Restore America's Estuaries

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Keep up with Interior's Ocean, Coasts and Great Lakes News via Facebook

www.facebook.com/USInterioroceanscoastsgreatlakes

Keep up with **Ocean, Coasts and Great Lakes Activities** on our own Facebook page. Launched in October 2013, our Facebook presence continues to grow and is a great way to keep up with Interior's Ocean, Coastal and Great Lakes activities across the Department and with our interagency partners. Here are some examples of recently shared stories. Visit and 'like' us today!

Learn about National Asian American and Pacific Islander Heritage Month: *http://asianpacificheritage.gov/index.html*

For more photos from American Samoa, *see page 17.*

Marine Protected Areas:

The MPA Center serves as a resource to all federal, state, territorial and tribal programs responsible for the health of the oceans. MPAs support the national economy by helping to sustain fisheries and maintain healthy marine ecosystems for tourism and recreation businesses; and promotes public participation in decision-making by improving access to scientific and public policy information.

See related stories page 8. Learn more: *http://marineprotectedareas.noaa.gov/*

At left- Urban runoff into the Anacostia River in Washington, D.C. presents an enormous challenge to restoration efforts. Learn how the Smithsonian Anacostia Community Museum Waterways program is serving the community for improved stewardship. *http://my.si.edu/initiatives/waterways/acm-reclaiming-the-edge-newsletter*

What's in your watershed? USGS "Streamer" gives you on-line access to watershed details, real-time streamflow conditions and more! *See Surfing Bison, page 28.*
Photo credit: Ann Tihansky, USGS

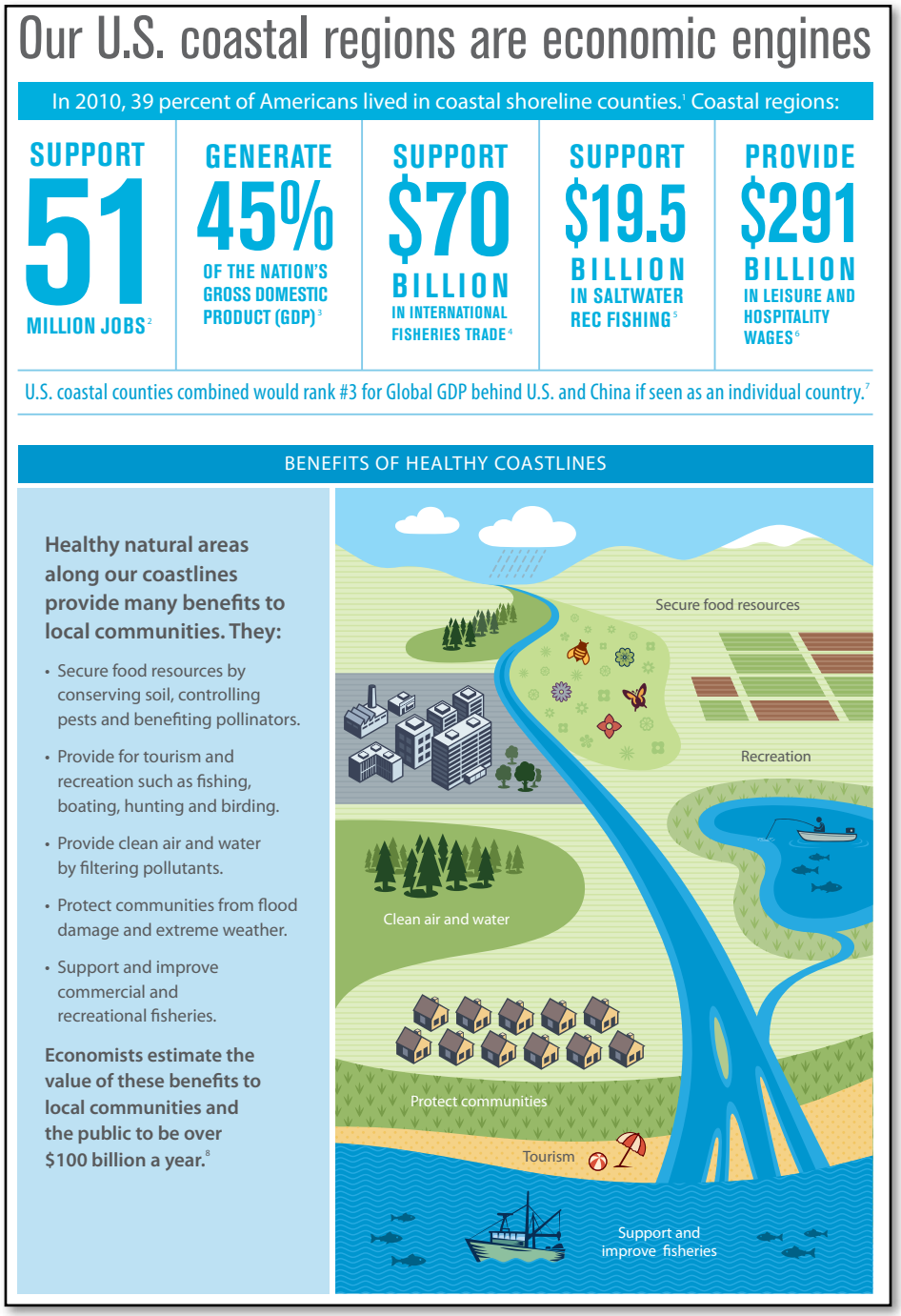
Restoration continued from page 1

The analysis, "*Restoration Returns: The Contribution of Partners for Fish and Wildlife Program and Coastal Program Projects to Local U.S. Economies*," documents how federal investments in local restoration projects stimulate local economies by creating jobs, supporting local businesses, and supporting local tax revenues. The U.S. Fish and Wildlife Service Coastal Program has partnered with more than 5,000 tribal, state, and local agencies, NGOs, corporations, and private land owners; restored 300,616 acres of wetland, 135,033 acres of upland and 2,160 miles of stream habitat; protected over 2 million acres of coastal habitat; and provided invaluable amounts of technical assistance to a diverse range of conservation partners.

Coasts and estuaries are essential to the economy and by some estimates contribute more than $1 trillion annually to U.S. GDP. In addition, coastal restoration work supports vitally needed jobs at higher rates than many other sectors, including oil and gas, road infrastructure and green building projects. From wetland reconstruction and improvement, rebuilding depleted oyster beds, removal of obsolete dams and culverts, tree planting, floodplain restoration, to invasive species removal, coastal restoration projects create up to 30 jobs for every $1 million invested.

These positive economic findings are all in addition to the many other nonmarket benefits of all healthy coastal areas, like providing habitat for threatened and endangered species, preserving recreational opportunities, and breathtaking beauty.

Top left: Parker River National Wildlife Refuge in Massachusetts. Photo credit: Kelly Fike, USFWS. Top right: USFWS staff Anne Walker (left), and Rebecca Chuck (right), restore habitat for the Oregon silverspot butterfly. Photo credit: Patrick Stark, USFWS.



Restore America's Estuaries released a visual infographic summarizing the economic analysis of the value of restoring coastal resources. The reports are available on-line:
http://www.estuaries.org/images/stories/RAEReports/partnersbookletfinalpdfpgs.pdf
http://www.estuaries.org/images/stories/RAEReports/coastalbookletfinalpgs.pdf

Resilience continued from page 1

improving the resiliency of coastal areas, we not only create opportunities for people to connect with nature and support jobs through increased outdoor recreation, but we can also provide an effective buffer that protects local communities from powerful storm surges and devastating floods when a storm like Sandy hits."

A federal impact assessment in 2013 estimated that Sandy damages exceeded $50 billion, with 24 states impacted by the storm.

The Disaster Relief Appropriations Act of 2013, appropriated $829.2 million ($786.7million post-sequester) for Interior's Hurricane Sandy mitigation effort. In May 2013 the Department released an initial $475.25 million to fund 234 recovery projects to repair and rebuild parks, refuges and other Interior assets damaged by the storm with investments in scientific data and studies to support recovery in the region including historic preservation.

Interior's Hurricane Sandy recovery activities are focused on supporting efforts to make our Nation more resilient to these impacts in the future.

In October 2013, $162 million was invested toward 45 restoration and research projects that will better protect natural resources and Atlantic coastal communities to reduce their vulnerability to future storms. These activities bring the bureaus together to apply scientific and technical expertise to activities restoring marshes, wetlands and beaches, as well as build greater understanding of coastal vulnerability, impacts, risk and products that support research and planning communities at local, state and federal levels. The Department also launched a $100-million Hurricane Sandy Coastal Resiliency Competitive Grant Program to fund science-based solutions to restore natural areas along the Atlantic Coast, helping to make local communities more resilient against future storms. Funded projects are expected to be announced in early June.

The investments are consistent with President Obama's Hurricane Sandy Rebuilding Task Force Strategy Report and the Administration's commitment laid out in the Climate Action Plan to build resilience by restoring natural features along shorelines to help better protect communities from future storms. Here's a rundown of how individual bureaus are responding:

U.S. Fish and Wildlife Service-USFWS

"We are committed to building a more resilient coast that will remain strong after Sandy," said USFWS Northeast Regional Director Wendi Weber. "These projects are designed to benefit wildlife and human communities now, but also to help them to better endure predicted intense storms and changing conditions in the future."

The USFWS has been working extensively to make national wildlife refuges safer and healthier for visitors and staff by cleaning up damages and upgrading facilities to withstand future storms. In addition, the Service is investing $102 million from the Act for 31 resilience projects that focus on protecting coastal communities from flooding and addressing more long-term concerns, including sea-level rise and preservation of habitat for vulnerable species.

Specific efforts include:

-Replenishing five beaches along the Delaware Bay that were badly eroded by Hurricane Sandy. The $1.65 million habitat restoration project, which benefits both native horseshoe crabs and migrating shorebirds, will also provide increased protection from storm surge and sea-level rise to local communities.

-Developing "living shorelines" in the Chesapeake Bay watershed to restore coastal habitat and native plant species, control erosion through dilution of wave energy and enhancement of submerged aquatic vegetation, and provide flood mitigation in vulnerable communities.

-Replacing and enlarging road culverts and removing damaged or obsolete dams throughout the region to reduce flood risk to adjacent communities and restore dozens of miles of accessible river habitat to native fish species. See: *http://www.fws.gov/hurricane/sandy/*

National Park Service-NPS

"This was not the first, and unfortunately it will not be the last storm we weather in the Northeast." said NPS Northeast Regional Director Mike Caldwell. "Our primary goal is to insure that our recovery projects offer long-term sustainable resiliency."

There are 122 individual recovery projects that are currently underway in the Northeast Region of the NPS. National Park assets along the Atlantic coastline including the Statue of Liberty National Monument and Ellis Island, Fire Island National Seashore, Assateague National Seashore and Gateway National Recreation Area have all been reopened.

There is still much repair work to be done and more than $30 million of Emergency Relief for Federally Owned Roads projects are underway, including the replacement of the visitor dock at the Statue of Liberty. At Ellis Island approximately $35 million has been dedicated to replacing irreparable infrastructure. Damaged roads, parking areas and boardwalks at Assateague and Fire Island National Seashores have been repaired. Though much work has already been accomplished, it will still take until 2015 before damaged electrical, heating and air conditioning systems are repaired and replaced.
See: *http://www.nps.gov/stli/after-hurricane-sandy.htm*

See Resilience page 24

Roseate Spoonbills at J.N. "Ding" Darling NWR. Photo credit: Steve Hillebrand, USFWS

Banking on Nature

The National Wildlife Refuge System is the world's greatest network of lands dedicated to wildlife conservation, and is also a powerful economic engine for local communities. In addition to conserving and protecting public lands for future generations, every dollar invested in the Refuge System generates huge economic dividends for the country. See the USWFS report, *'Banking on Nature,'* for more details. *http://www.doi.gov/news/loader.cfm?csModule=security/getfile&pageid=380921*

White House continued from page 1

Read the full proclamation: *http://www.whitehouse.gov/the-press-office/2014/05/30/presidential-proclamation-national-oceans-month-2014* The ocean will be also be in the spotlight at Capitol Hill Ocean Week: *http://nmsfocean.org/CHOW-2014* and the international "Our Ocean" conference hosted by the State Department: *http://our-ocean2014.state.gov/*

The National Ocean Council Office named new Director Beth Kerttula. She is a visiting fellow from Stanford University's Center for Ocean Solutions and has served 15 years in the Alaska House of Representatives, including as House Minority leader from 2006 to 2013. She has expertise in marine pollution, ocean acidification, and coastal zone management.

Beth Kerttula, started as the new National Ocean Council Director on June 2. Photo credit: Ron Clarke.

Climate Change Report

In May 2014, the U.S. Global Change Research Program released the Third National Climate Assessment, the authoritative and comprehensive report on climate change and its impacts shows far-reaching impacts and evidence of climate change impacts in every state. *http://nca2014.globalchange.gov/*

Key messages indicate that the NE U.S. will experience heat waves, coastal flooding, and river flooding that will will pose a growing challenge to the region's environmental, social, and economic systems. See how Interior is incorporating this into Sandy recovery activities --*related story page 1.*

The founding members of the Coral Triangle Initiative's Women Leaders Forum met at the U.S. Department of the Interior in Washington, DC. Interior's Deputy Assistant Secretary for Policy and International Affairs, Lori Faeth (head of table right) and NOAA Assistant Administrator for Fisheries, Eileen Sobeck (head of table left) hosted Professor Noraieni Mokhtar, Head of Delegation, (seated left of Sobeck) along with other members representing Indonesia, Malaysia, Papua New Guinea, Philippines, Solomon Islands and Timor-Leste. Photo credit: Ann Tihansky, USGS.

Coral Triangle Initiative--The Women's Leadership Peer Exchange

By Patricia Bickley, DOI

Women in Southeast Asia rely heavily on marine resources to feed their families. They have a strong vested interest, therefore, in conserving marine resources for future generations. Those resources, however, face difficult challenges from overfishing to pollution to climate change.

Recently, female leaders from the six countries of Southeast Asia's Coral Triangle—Indonesia, Malaysia, Papua New Guinea, Philippines, Solomon Islands and Timor-Leste—joined forces to establish a Women Leaders Forum to tackle the marine and coastal resource challenges facing their countries, with the support of the U.S. Department of the Interior (DOI), the U.S. Agency for International Development (USAID), and the Bali-based nongovernmental organization, the Coral Triangle Center. The Women Leaders Forum springs from the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (CTI-CFF), a landmark multilateral ocean governance initiative spearheaded by these countries to safeguard the marine and coastal resources of the Coral Triangle Region.

The Women Leaders Forum was launched with a U.S.-based Women's Leadership Peer Exchange from April 24-May 2 designed to bolster the leadership skills of the Forum members and strengthen their networks to accelerate progress towards common conservation goals. The Peer Exchange featured meetings with U.S.-based conservation leaders, site visits to marine protected areas in the U.S. Virgin Islands (USVI), and leadership

See Coral Triangle page 6

The Coral Triangle Initiative's Women Leaders Forum delegation visited the U.S. V. I. Salt River Ecological Preserve hosted by NPS Superintendent Joel Tutein who discussed the strong and effective partnership activities the NPS has with the Virgin Islands government, The Nature Conservancy and NOAA. U.S. V.I. Congresswoman Christensen joined the group for this visit. Photo credit: Patricia Bickley, DOI.

Coral Triangle continued from page 5

training at the U.S. Fish and Wildlife Service's National Conservation Training Center. In Washington, DC, the 14-member delegation met with officials and subject matter experts from DOI, the National Oceanographic and Atmospheric Administration (NOAA), the U.S. State Department, USAID, and Congressional offices, most notably DOI Deputy Assistant Secretary for Policy and International Affairs Lori Faeth; NOAA Assistant Administrator for Fisheries Eileen Sobeck; Barbara Best, Senior Coastal Resource Management and Policy Specialist at USAID; and staff from the offices of Congresswomen Hanabusa (HI) and Bordallo (GU). The meetings addressed the shared challenges and practical lessons learned from managing marine resources.

During sites visits in St. Croix, Virgin Islands, the delegation met with representatives from the National Park Service (NPS), NOAA, the government of the U.S. Virgin Islands, and The Nature Conservancy to share experiences on youth education, marine protected area establishment and management, and public-private partnerships. Joel Tutein, Superintendent of Christiansted National Historic Site, Buck Island Reef National Monument and Salt River Bay Ecological Preserve, noted that the challenges faced by the Coral Triangle countries demand creative approaches and that the U.S. can learn much from the experience being gained. During the site visit, the delegation witnessed signs of reef degradation due to climate change and overuse, and saw the benefits of law enforcement for reef conservation.

Following the site visit, the delegation returned stateside to engage in educational and inspirational leadership and teambuilding exercises at the U.S. Fish and Wildlife Service's National Conservation Training Center in Shepardstown, West Virginia. On the final day of training, the group developed a 12-month action plan for the Women Leaders Forum, including planning for the Forum's official launch at the World Coral Reef Conference on May 12 in Manado, Indonesia, and other follow-up activities to increase awareness of women-led conservation initiatives in the Coral Triangle.

Preparing for Tsunamis

Tsunami educational video available on-line: *http://pubs.usgs.gov/gip/105/*

Tsunamis are a constant threat to the coasts of our world. Although tsunamis are infrequent, it is possible and necessary to prepare for potential tsunami hazards. Community awareness programs are important for informing society through education and training and are aimed at minimizing loss of life and property.

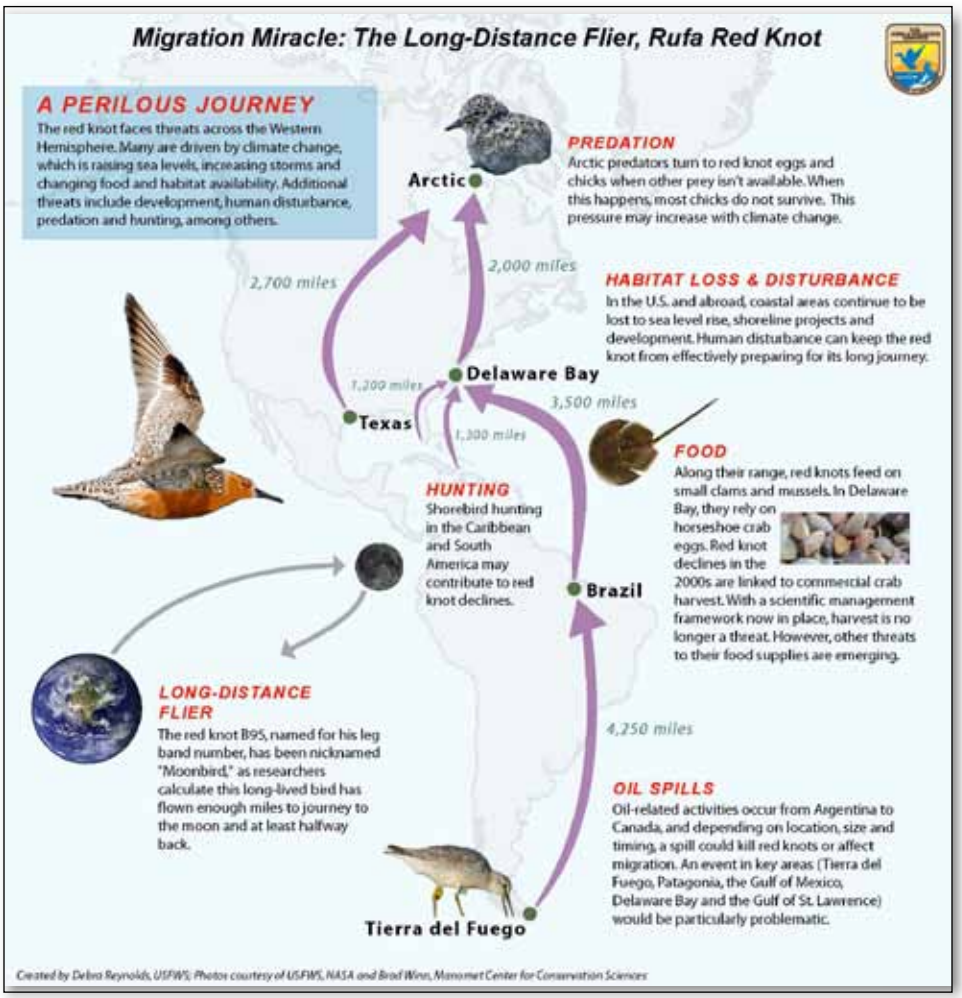
This video explains the geologic causes of tsunamis and offers guidelines for correct tsunami response. It also shares tips for community preparedness from local emergency managers, first-responders, and leading experts on tsunami hazards and warnings, who have been working on ways of making tsunami affected regions safer for communities on a long-term basis.

This video was produced by the US Geological Survey in cooperation with the California Emergency Management Agency, Oregon Department of Geology and Mineral Industries, Washington Emergency Management Division, Marin Office of Emergency Services, and Pacific Gas and Electric.

Rufa Red Knots Face Many Threats

The red knot is one of the longest-distance migrants in the animal kingdom. This shorebird flies up to 18,600 miles a year on a 20-inch wingspan. While migrating between wintering grounds as far south as Tierra del Fuego in South America and breeding grounds in the Canadian Arctic, the shorebird can be found in flocks of a few individuals to several thousand along the Atlantic and Gulf coasts.

Red knot population has declined by about 75 percent in some areas since the 1980s. Changing climate conditions are already affecting the bird's food supply, the timing of its migration and its breeding habitat in the Arctic. The shorebird also is losing habitat along its range due to sea level rise, shoreline projects and development. In response, the USFWS reopened the comment period on the proposal to protect red knot under Endangered Species Act on April 3. The Service expects to take final action on the listing rule by the end of September 2014. As required by the ESA, the Service is also reviewing the U.S. range of the knot to identify areas that are essential for its conservation, called critical habitat.



The rufa red knot faces many challenges during one of the longest migrations known in the animal kingdom. Image source: *http://www.fws.gov/northeast/redknot/*

Critical habitat focuses the coordination of federal agencies, which are directed by the ESA to aid in the conservation of listed species. Critical habitat for the knot may include sand dunes and wide, open beaches for roosting and habitat supporting prey like small clams.

The USFWS expects to publish a separate rule proposing critical habitat in 2014.

http://www.fws.gov/news/ShowNews.cfm?ID=2888AF73-A5AC-F798-302D3B6301D73FEC

http://www.fws.gov/southeast/news/2014/027.html

Watch video clips of red knots along the shore: *http://www.youtube.com/watch?v=Ilftyx6pUr8&list=PLZb5DyVcCk95dccHWlIi-uTeZ0D-vOZdC&index=3* Photo credits: USFWS

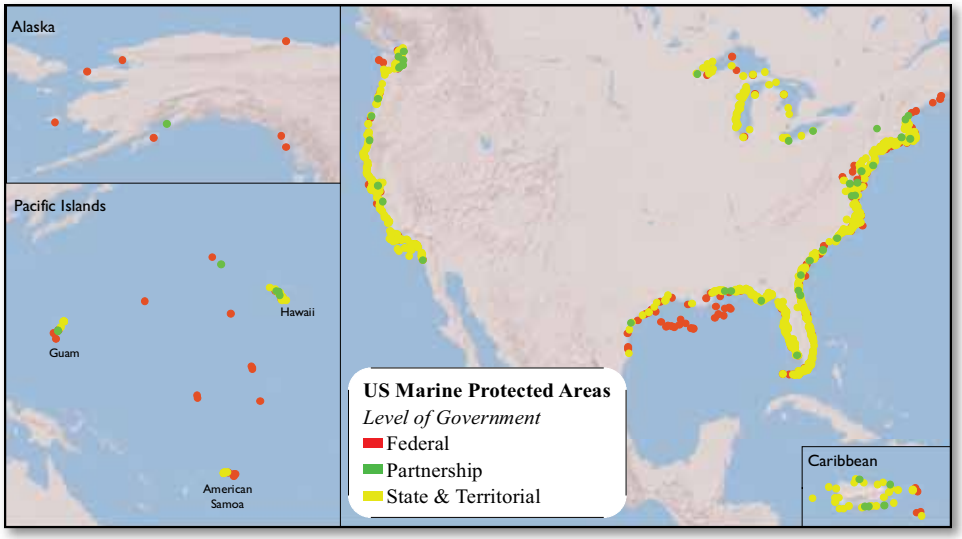
Conserving our Oceans One Place at a Time

Marine protected areas not only protect the marine life and cultural resources within their boundaries, but are a valuable tool for protecting marine ecosystems and the coastal communities they sustain.

U.S. MPAs at a Glance:

The coastal and ocean waters around the United States are home to a wide array of MPAs of all sizes, shapes, and purposes. A quick overview of all types of MPAs in U.S. waters, including those established for natural heritage, cultural heritage and sustainable production, reveals that:

- **The United States currently has more than 1,700 MPAs.**
- **About 41 percent of all U.S. waters out to 200nm are in some form of MPA (includes sustainable production [fishery] MPAs which often have specific gear restrictions over large ocean areas)**
- **About 8 percent of all U.S. waters are protected by MPAs focused on natural heritage or cultural heritage (excluding sustainable production MPAs),**
- **Nearly all (85 percent) U.S. MPAs are multiple use, allowing some form of extractive activities,**
- **No take MPAs occupy only about 3 percent of all U.S. waters,**
- **About 7 percent of the area in MPAs in the U.S. is no take,**
- **State and territorial governments manage approximately 76 percent of the nation's MPAs,**
- **Federal agencies manage 60% of the U.S. MPA area.**



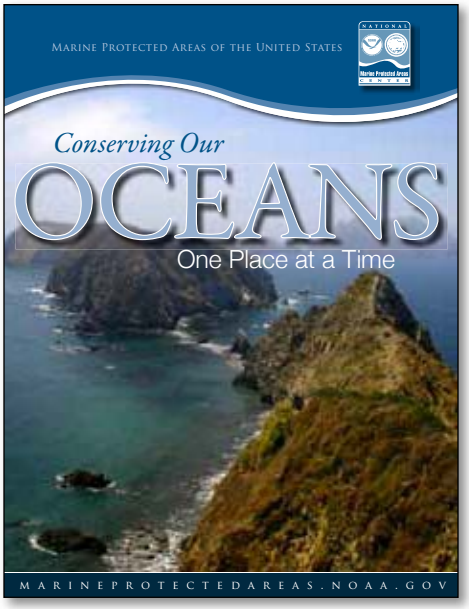
The National System of Marine Protected Areas. Image credit: MPA Center.

A National System of Marine Protected Areas

Cliff McCreedy (NPS) and Lauren Wenzel (NOAA)

The United States national system of marine protected areas (MPAs) advances the conservation and sustainable use of the nation's natural and cultural marine resources. There are more than 100 state, territorial, and commonwealth agencies with area-based management authority.

Every state and territory has different authorities that regulate the environment, manage lands, and regulate commerce. MPAs are used by states, local governments and other municipalities, for a variety of purposes ranging from managing fisheries, protecting marine species, nursery grounds, shellfish beds, recreation, tourism, and other important natural and cultural resources such as preserving shipwrecks and maintaining traditional or cultural connections to the marine environment.



This new report provides an overview and examples of how MPA's help conserve ocean resources. *http://marineprotectedareas.noaa.gov/pdf/fac/mpas_of_united_states_conserving_oceans_1113.pdf*

The MPA Center (co-managed by the Department of the Interior and NOAA), provides guidance and resources to management authorities at federal, state, territorial, tribal, and international levels. The system enhances protection of U.S. marine resources by providing new opportunities for regional and national cooperation.

Learn more: *http://marineprotectedareas.noaa.gov/nationalsystem/framework/*

UPDATE - Restoring the Gulf after the Deepwater Horizon oil spill

By Nanciann Regalado, USFWS

Interior has a major role in one of the largest ecosystem restoration efforts ever undertaken in the United States – the complex and multi-faceted restoration of the Gulf of Mexico and adjacent coastal areas following the Deepwater Horizon oil spill that occurred in April 2010. Although the oil spill is only the latest in a series of events that have had a negative environmental impact on the Gulf, the oil spill was the catalyst for a major infusion of federal funding to address environmental damage in the Gulf through a number of different funding sources.

Interior has taken a lead role in the ensuing Natural Resource Damage Assessment (NRDA). This damage assessment and restoration effort includes five coastal states and four federal agencies, all acting as "natural resource trustees" under the framework of the Oil Pollution Act.

Oil spill response actions near the Deepwater Horizon drill site May 27, 2010 from 3,000 feet. Photo by Tom MacKenzie, USFWS.

Of the Early Restoration $1 billion, Phase I and II plans use $72 million; the proposed Phase III will use $627 million if approved; approximately $300 million remains for additional projects. Source: USFWS.

Aside from its unprecedented geographic scope and complexity to assess natural resource injury caused by the spill, a unique feature of this National Resource Damage Assessment and Restoration (NRDAR) is the $1 billion early restoration agreement with BP, one of the parties responsible for the oil spill. Early restoration allows restoration planning and project implementation to begin prior to completion of the natural resource injury assessment. In the four years since the spill, Interior has led the early restoration planning effort. With its fellow Trustees, the Phase I, II and III early restoration plans have identified 54 restoration projects, 10 of which were approved in Phases I and II in 2012. The Phase III restoration plan and its 44 proposed projects is close to completion, and if approved, Phases I – III will account for the allocation of approximately $700 million of the original $1 billion made available by BP. More information about the Deepwater Horizon NRDA Early Restoration plans and projects can be found at the Trustee website: *http://www.gulfspillrestoration.noaa.gov/restoration/*
and at: *www.doi.gov/deepwaterhorizon.*

Interior is also working with the five Gulf Coast States and five other federal agencies to improve the Gulf's health beyond what can be accomplished by the NRDAR. While the Oil Pollution Act's NRDAR seeks damages to address injuries caused by the spill, the RESTORE ACT of 2012 directs 80% of all civil and administrative penalties paid by the responsible parties under the Clean Water Act to the newly created Gulf Coast Restoration Trust Fund which was established to return these funds for investment in the Gulf rather than to the U.S. Treasury where they would have deposited in the Treasury's Oil Spill Liability Trust

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Fund. Instead, the RESTORE Act benefits the Gulf Coast region by making enhanced funding available for the purposes of ecosystem restoration, economic recovery, and tourism promotion.

The RESTORE Act framework divides the funding into five separate allocations and, as a member of the 11-member RESTORE Council, a newly created independent federal entity, Interior plays the greatest role in two of these processes. Under the RESTORE Act, the RESTORE Council receives 30% of the money deposited into the trust fund. These funds will be used to implement a list of projects selected by the Council members and consistent with the Council's 2012 Initial Comprehensive Plan that establishes overarching goals and outlines actions to restore and protect natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands throughout the Gulf Coast Region, which is generally the coastal zones of the five Gulf Coast. The remaining RESTORE Act funding will be distributed to the Gulf Coast States and to NOAA which will manage a small portion of the funding for a research and science program benefitting Gulf Coast fisheries. By February 2015, approximately $800 million will be deposited in the Gulf Coast Restoration Trust Fund for distribution to the five Gulf Coast States, the RESTORE Council and NOAA. More information about the RESTORE Council and the distribution of funds under the RESTORE Act: *http://www.restorethegulf.gov/*

In addition to the $1 billion in early NRDA restoration and the RESTORE Act, an additional and immediate source of funding is that being made available to the National Fish and Wildlife Foundation (NFWF) pursuant to criminal plea agreements with BP and Transocean that will result in more than $2.5 billion in investment to the Gulf over the next five years. The funds to be allocated by NFWF will be used to remedy harm from the spill and eliminate or reduce the risk of future harm to Gulf Coast natural resources. Generally, the allocation of the funding will result in $1.272 billion for barrier island and river diversion projects in Louisiana, $356 million each for natural resource projects in Alabama, Florida, and Mississippi, and $203 million for similar projects in Texas. NFWF has thus far consulted with state and federal resource agencies, and obligated more than $260 million for projects designed to protect, restore and enhance natural and living resources across the Gulf Coast. For more information, visit: *http://www.nfwf.org/Pages/default.aspx*

Also within Interior, the U.S. Fish and Wildlife Service's North American Wetlands Conservation Fund will receive $100 million as a result of BP's violation of the Migratory Bird Treaty Act. NAWCA will use these funds to provide matching grants for projects that will benefit migratory species affected by the spill. In FY 14, nine U.S. projects were approved for a total of close to $9 million. Ten projects worth approximately $5 million in Canada and Mexico also have been recommended for funding.

Overall, as a result of the Deepwater Horizon Oil Spill, more than $4 billion is being directed at the Gulf Coast region and will provide significant environmental and economic benefits through the implementation of many diverse projects. As these initial projects are being implemented, Interior is working with its partner agencies to fully assess the injuries from the oil spill, so that future damages may be assessed. Interior also is working with Gulf Coast States and other federal agencies to develop and implement a long-term restoration vision for the Gulf of Mexico and its adjacent coastal areas to promote long-term sustainability and resilience for one of the most ecologically important and productive regions of the country.

An oiled gannet being cleaned at the Theodore Oiled Wildlife Rehabilitation Center in Alabama, June 17, 2010 as part of the response to the Deepwater Oil Spill. Photo credit: Colin White, U.S. Coast Guard.

"Wetland Change in Coastal Louisiana 1932 to 2010"

Coastal Louisiana wetlands make up the seventh largest delta on Earth, contain about 37 percent of the estuarine herbaceous marshes in the conterminous United States, and support the largest commercial fishery in the lower 48 States. These wetlands are in peril. Of the total coastal wetland loss in the continental United States, about 90 percent currently occurs in Louisiana.

Watch the video on- line:
http://gallery.usgs.gov/videos/433#.U4N0U4XIkgg

USGS to Launch Coastal Hazards Portal

Access to basic and applied coastal research and data

By Rob Thieler, Hilary Stockdon, and Jordan Read (USGS)

Coastal stakeholders will soon have direct access to assessments of potential storm and sea-level change impacts on our Nation's coasts, as well as tools to assess rates of shoreline change and probabilities of erosion during storms and long-term sea-level rise.

> ***"The explicit goal of this project is to enable users to integrate and apply USGS data and tools to address their specific needs."***
>
> -John Haines, USGS Coastal and Marine Geology Program Coordinator

The 'Coastal Change Hazards' (CCH) on-line web portal provides interactive access to coastal change science and data for our Nation's coasts. USGS Coastal and Marine Geology Program (CMGP) scientists working with informatics specialists and software engineers at the USGS Center for Integrated Data Analytics created the on-line web resource for coastal communities.

The USGS CCH portal allows users to find scientific information and data on coastal hazards and collect it in a virtual sand bucket, which they can explore, download, and share. Image credit: Martin Wernimont, USGS

Through this portal, federal and state agencies, non-governmental organizations, municipal entities, and private citizens can easily access and use USGS data, analyses, and tools to visualize coastal change vulnerability and apply this information to other questions, scenarios or specific planning needs.

"Our Nation's coastlines are constantly changing landscapes that pose unique management challenges. Robust scientific findings help identify areas that are most vulnerable to diverse coastal change hazards. On-line web-access to data, models, and tools for on-the ground application fulfills a critical immediate and ongoing need for scientifically credible and actionable information to support land-use planning, infrastructure, ecosystem and cultural resource management decisions. This information is needed by planners and emergency managers as they work to protect resources, reduce risk, and prevent economic losses," said CMGP Coordinator John Haines.

The portal builds on open-source, community standards for web mapping and data sharing. The portal is continually updated with new data and analyses, such as shoreline positions and rates of change, pre- and post- storm vulnerability assessments based on dune heights, storm surge elevations, and wave conditions.

Coastal stakeholders can use the portal to assess potential impacts of coastal change as well as rates of change due to coastal erosion, and sea-level change. The geospatial platform also provides a means to collect, analyze, and communicate with USGS collaborators and the public. For example, USGS tools for shoreline change analysis can be integrated into this platform so that adding new shoreline data and the ability to perform analyses is available to both project scientists and the public (e.g., universities, state agencies, NGOs). Common data and tools can have wide and diverse applications. For example, USFWS refuge managers can develop an appropriate forecast for resource or endangered species management, while NPS managers can evaluate alternative scenarios of facilities vulnerability due to changing hazard exposure. An interactive decision support tool will include ability to integrate multi-scale information (storms, shoreline change, sea-level rise) into a decision context for natural and cultural resource planning.

The USGS CCH portal is designed with mobile device access in mind, so can be used in the field and when desktop computers are not available, such as during and after storms. Image credit: Martin Wernimont, USGS

Ultimately, the USGS Coastal Change Hazards portal will put science, data, and tools in the hands of decision-makers and planners when and where they need it most.

Sturgeon Quest Shares Bibliography On-line

A bibliography of all known reports presenting, documenting, summarizing, listing, or interpreting information on the Gulf sturgeon (*Acipenser oxyrinchus desotoi*) through December 2013 now available. USGS work with partners identified the need for such a clearinghouse of report resources. Visit: *http://fl.biology.usgs.gov/coastaleco/sturgeon_quest/sturgeon_bibliography.html*

USGS scientist Mike Randall tags a Gulf Sturgeon on the Suwannee River. Photo credit: Ann Tihansky, USGS.

See vanishing coastal areas in the Arctic

Above: Between Fish Creek and Nechelik Channel, Harrison Bay, Beaufort Sea. Lat: N70 21.854 Long: W 151 12.923. A disappearing landscape! Tundra that is slipping below sea-level. An area of low-centered permafrost polygons where thaw subsidence in the polygon centers and in the polygonal fracture cracks is allowing the ingress of the sea. This entire area is submerged during storm surges. This image and others are part of an exhibit sponsored by BOEM, NPS, NOAA and other partners, and was recently on display at the annual meeting of the International Association of Landscape Ecologists in Anchorage, AK May 18-22, 2014. See more images and learn about the Alaska Shorezone Coastal Inventory and Mapping Program: *http://www.shorezone.org/*

North Slope Coastal Imagery Site: *http://northslopecoast.net/*
BSEE funded the development of this portal to aerial video and images of the North Slope of Alaska coastline to, "support the decision-making process of the Federal On-Scene Coordinator (FOSC) when determining the optimum response methods given a unique marine oil spill scenario." Images are georeferenced so a user can click on the flightline and view either a video or photos of that section of coast. NOAA, USGS, and the Alaska OCS Region of BOEM provided the imagery.

Webinars for MPA's

The MPA Center supports management activities through a monthly webinar series. These webinars are free and open to the internet public.
Tune in!

June 12 -Preparing for Disaster at MPAs, Will Underwood, Stewardship Coordinator, Grand Bay National Estuarine Research Reserve, Mississippi Department of Marine Resources, Will Underwood, Stewardship Coordinator – Grand Bay National Estuarine Research Reserve, Mississippi Department of Marine Resources

July 10 -Building Capacity to Sustainably Manage Increasing Recreational Uses in MPAs, Priscilla Brooks – Conservation Law Foundation and MPA Federal Advisory Committee and, Charlie Wahle, Ph.D. - NOAA MPA Center

August 14- A Climate-Smart Approach to Adaptive Management of North-central California Coast and Ocean Habitats, Species, and Ecosystem Services Sara Hutto - Gulf of the Farallones National Marine Sanctuary Climate-Smart Adaptation Project Coordinator

September 11- A Cultural Resources Toolkit for MPA Managers, Valerie Grussing, MPAC Cultural Resources Coordinator

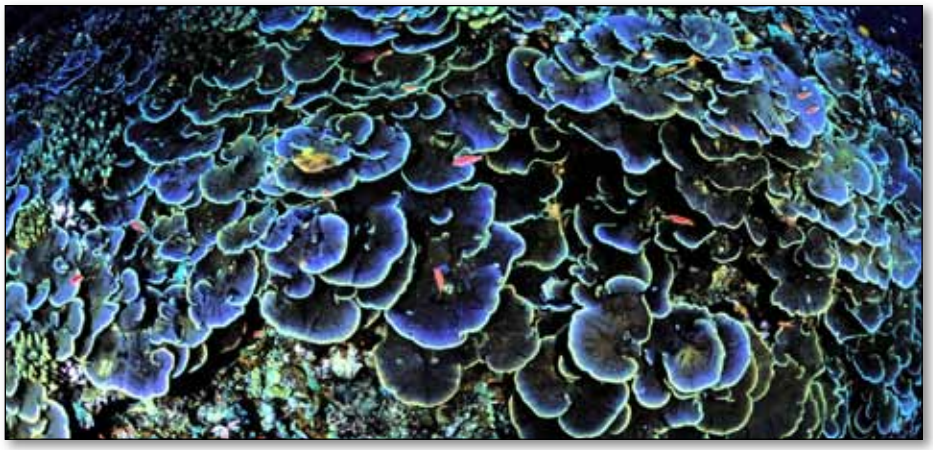
Presentation archives with video: *http://marineprotectedareas.noaa.gov/resources/webinars/archive.html*

A large colony of Boulder Brain Coral (*Colpophyllia natans*) at the Marine Protected Area, Hurricane Hole in Virgin Islands Coral Reef National Monument. Photo credit: Caroline Rogers, USGS.

Special Feature-- Interior's Diverse Role in Coral Reef Protection

By Liza Johnson, DOI

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and commitments to island communities. As the Nation's principal conservation agency, Interior protects some of the healthiest and most endangered coral reefs, tropical islands, and adjacent submerged ecosystems in the world. Interior bureaus also conduct pioneering research on coral reefs and support their management and protection in the U.S.-affiliated insular areas.



Swirls of *Montipora aequituberculata*, a core coral, attract fish at Jarvis Island National Wildlife Refuge in the Pacific, about 1,300 miles southwest of Honolulu. Photo credit: Jim E. Maragos/USFWS

Interior and NOAA co-chair the U.S. Coral Reef Task Force, working with other Federal, state, territorial and Freely Associated States and partners to map and monitor coral reefs; provide scientific information to support management decisions; prevent loss of coral reefs from pollution, over-fishing, disease, climate change and other threats; and promote awareness of the urgent need to protect these fragile ecosystems for present and future generations.

Contact: Liza Johnson, *liza_m_johnson@ios.doi.gov*

U.S. Coral Reef Taskforce

http://www.coralreef.gov/

The United States Coral Reef Task Force (USCRTF) was established in 1998 by Presidential Executive Order to lead U.S. efforts to preserve and protect coral reef ecosystems through partnerships, strategies, and support for on-the-ground action.

This expanse of plate coral (*genus Monitpora*) is just one of over 130 species of stony coral found at the Palmyra Atoll National Wildlife Refuge in the Pacific Islands. Photo credit: Kydd Pollack

U.S. Fish and Wildlife Service (USFWS)

http://www.fws.gov/refuges/whm/coastalandmarine.html

The USFWS has many important responsibilities that help protect coral reefs including law enforcement, invasive species control, threatened and endangered species, contamination remediation, and habitat restoration. For example, USFWS wildlife inspectors are the Nation's front-line defense against illegal trade of wildlife parts, a significant and growing threat to coral reefs worldwide. The USFWS's Coastal Program provides financial and technical assistance to partners for the conservation and restoration of priority watersheds improve water quality in coastal coral reef ecosystems. In addition, the USFWS manages 15 sites within the National Wildlife Refuge

See Coral Role page 14

Coral Role continued from page 13

System and other co-managed Marine National Monuments that contain coral reefs including some of the most remote and relatively pristine coral reefs in world.

Contact: Pete Leary, *pete_leary@fws.gov*

U.S. Geological Survey (USGS)

Caribbean coral research: *http://coastal.er.usgs.gov/crest/*

Pacific coral research:*http://coralreefs.wr.usgs.gov/*

The USGS works closely with academic institutions, state, and other Federal agencies, to provide the critical scientific understanding of coral ecosystem responses to natural and anthropogenic environmental changes that affect the health and sustainability of our Nation's coral reefs. Increased understanding of trophic coupling and habitat connectivity among coral reef, mangrove, and seagrass communities will inform management strategies for mitigation and adaptation of climate change and other stressors. USGS reef ecosystem studies focus on three primary science directions including: 1) understanding the structure and function of reef communities and the role of marine reserves in maintaining biodiversity and ecosystem services; 2) studying impacts of land-based pollution; and 3) evaluating impacts of climate change.

Contact: Mark Hudy, *mhudy@usgs.gov*

National Park Service (NPS)

http://www.nature.nps.gov/water/oceancoastal/

The NPS is working to restore and maintain the exceptional biological and recreational values of coral reefs for current and future generations. A total of 10 National Parks with coral reefs in Hawai'i, Guam, American Samoa, the U.S. Virgin Islands and South Florida attract more than 1.5 million visits per year. NPS monitors coral health to better understand coral bleaching and disease, overfishing, impaired water quality, recreational overuse, and other impacts to the beauty and ecological integrity of reefs. NPS also adopted a joint Fisheries Management Plan with the state of Florida at Biscayne National Park, and established fully protected marine reserves at Dry Tortugas

A high abundance and diversity of corals in the mangrove-lined bays of Hurricane Hole, Virgin Islands Coral Reef National Monument, appears to be unique within mangrove ecosystems in the Caribbean. USGS research on patterns of coral abundance and distribution, combined with water chemistry data, is providing clues as to how coral grow and how reefs might respond to climate change. Photo credit: Caroline Rogers, USGS.

National Park Service divers monitor elkhorn coral at the Virgin Islands National Park in St John, U.S. Virgin Islands. Photo credit, Brett Seymour, NPS.

Coral reef community in the Caribbean. Photo credit: USGS.

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Coral Role continued from page 14

National Park, Buck Island Reef National Monument and Virgin Islands Coral Reef National Monument to restore fish populations and reef ecosystems and protect corals from physical damage.

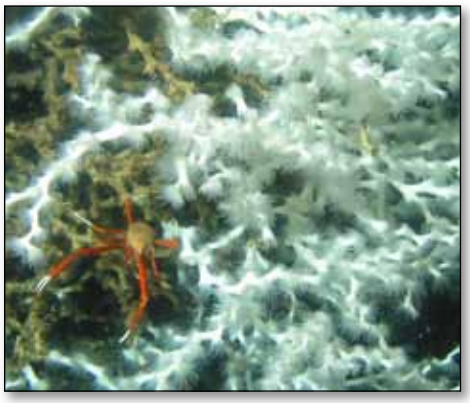
Contact: Cliff McCreedy, *cliff_mccreedy@nps.gov*

Bureau of Ocean Energy Management (BOEM)

http://www.boem.gov/Studies/

As stewards of the Federal offshore lands known as the Outer Continental Shelf (OCS), BOEM is responsible for balancing the Nation's search for energy and marine minerals while protecting the human, marine and coastal environments. BOEM environmental programs provide information necessary to support sound decisions regarding offshore energy and non-energy activities. Programs in the Gulf of Mexico that ensure the conservation of coral reef resources on the OCS include research and monitoring of coral reefs in the Flower Garden Banks National Marine Sanctuary, investigation of coral growth on oil and gas structures, and research on deep-sea cold water corals. Although not true coral reefs, abundant coral habitat is also found on numerous topographic features on the continental shelf of the Gulf of Mexico that are also protected through mitigations applied for impact avoidance of energy development activities.

Contact: Greg Boland, *gregory.boland@boem.gov*



BOEM protects these deepwater coral colonies of *Lophelia pertusa*, as part of the coral habitat in lease areas of the Gulf of Mexico. Photo credit: BOEM Lophelia I Project.

Elkhorn coral provides structure for reef fish in the Caribbean. Photo credit: USGS.

Office of Insular Affairs (OIA)

http://www.doi.gov/oia

With the majority of U.S. coral reefs located in the insular areas, OIA plays an important role in improving the management and protection of the Nation's coral reefs. OIA provides technical and financial assistance to support coral reef conservation in the U.S. Virgin Islands, Guam, the Commonwealth of the Northern Mariana Islands, American Samoa and the freely associated states of the Republic of Palau, the Republic of the Marshall Islands and the Federated States of Micronesia.

Contact: Karen Koltes, *karen_koltes@ios.doi.gov*

Above-Corals in the Palmyra Atoll National Wildlife Refuge are part of the Pacific Remote Islands Marine National Monument (approximately 86,888 square miles) extending 50 nautical miles from the mean low water lines of Howland, Baker, and Jarvis Islands; Johnston, Wake, and Palmyra Atolls; and Kingman Reef. Photo credit: Jim E. Maragos, USFWS.

At right- Massive starlet coral in the Florida Keys. Photo credit: USGS.

Coral Reefs Provide Critical Coastal Protection

New study shows that coral reefs provide risk reduction benefits to hundreds of millions of coastal inhabitants around the world

This unique perspective taken from 'down under' shows a wave crashing over a coral reef protecting the low-lying islands on Kwajalein Atoll in the Republic of the Marshall Islands. It clearly illustrates how healthy coral reefs cause waves to break offshore and dissipate their energy before reaching the shoreline, lessening the probability of coastal erosion and inundation. Photo credit: Curt Storlazzi, USGS.

Stronger storms, rising seas, and flooding are placing hundreds of millions people at risk around the world, and big part of the solution to decrease those risks is just off shore. A new study finds that coral reefs provide substantial protection against natural hazards by reducing wave energy that would otherwise impact coastlines by an average of 97 percent (studies across all tropical oceans).

"Coral reefs are wonderful natural features that, when healthy, can provide comparable wave reduction benefits to many artificial coastal defenses and adapt to sea-level rise" said Dr. Curt Storlazzi a co-author from USGS. "This research shows that coral reef restoration can be a cost-effective way to decrease the hazards coastal communities face due to the combination of storms and sea-level rise."

Published in the journal "Nature Communications," this study by an international team of researchers from the University of Bologna, The Nature Conservancy, U. S. Geological Survey, Stanford University and University of California – Santa Cruz, provides the first global synthesis of the contributions of coral reefs to risk reduction and adaptation across the Atlantic, Pacific, and Indian Oceans.

Lead author, Dr. Filippo Ferrario, from the University of Bologna, said, "restoration and conservation of coral reefs is an important and cost effective solution to reduce risks from coastal hazards and climate change."

The median cost for building artificial breakwaters is $19,791 per meter, compared to $1,290 per meter for coral reef restoration projects.

"Coral reefs serve as an effective first line of defense to incoming waves, storms and rising seas," said Dr. Michael Beck, lead marine scientist of The Nature Conservancy and a co-author of the study, "200 million people across more than 80 nations are at risk if coral reefs are not protected and restored."

These are people in villages, towns, and cities who live in low, risk prone coastal areas (below 10m elevation) and within 50 km of coral reefs. In terms of number of people who receive risk reduction benefits from coral reefs, the top 15 countries include:

1. Indonesia, 41 million
2. India, 36 million
3. Philippines, 23 million
4. China, 16 million
5. Vietnam, 9 million
6. Brazil, 8 million
7. United States, 7 million
8. Malaysia, 5 million
9. Sri Lanka, 4 million
10. Taiwan, 3 million
11. Singapore, 3 million
12. Cuba, 3 million
13. Hong Kong, 2 million
14. Tanzania, 2 million
15. Saudi Arabia, 2 million

http://www.usgs.gov/newsroom/article.asp?ID=3887#.U3uDoIXIkgg

See related stories this issue: Special Feature on DOI's role in protecting coral pg. 13, and DOI's involvement with the Coral Triangle Initiative pg. 5.

Celebrating Pacific Islander Culture

The National Park of American Samoa shared pictures of Pacific Islander culture recognized during National Asian American and Pacific Islander Heritage Month this past May.

American Samoa is an unincorporated territory of the U.S. located in the South Pacific Ocean that consists of five main islands and two coral atolls. Samoan culture, customs, and traditions emphasize the importance of the extended family, the "aiga". Samoans consider their island to be sacred and lands, waters, and food sources are managed to sustain their society for the future. Learn more about American Samoa: *http://www.americansamoa.travel/*

Above- Song and dance are integral to the Samoan way. Traditional singing and dancing is passed on to younger generations through traditional ceremonies and group gatherings. Photo credit: Michael Larson, NPS.

At left- In a traditional Samoan home, called a fale (fah-LAY), it is customary to sit on the floor before talking, eating, or drinking. When seated, you must cross your legs or cover them. Photo credit: Michael Larson, NPS .

Below- Fine mats (known as toga) were the traditional currency in Samoan culture before the use of coins and paper money. Today they are still used in gift exchanges for funerals, weddings, or chief-bestowing ceremonies. Fine mats are "plaited," an ancient technique of interlacing pandanus leaves. Artisans are almost always women, and mats have both ceremonial and everyday uses. Photo credit: Michael Larson, NPS .

Visit the National Park of American Samoa on-line: *http://www.nps.gov/npsa/index.htm*

You can also 'like' the National Park of Samoa on Facebook: *https://www.facebook.com/pages/National-Park-of-American-Samoa/118648148187878?ref=ts&fref=ts*

iCoast – Did the Coast Change?

Become an iCoast citizen scientist and help identify coastal changes using aerial photographs!

By Ethan Alpern and Sophia B. Liu, USGS

Hurricane season starts June 1. Do you know what happens when extreme storms hit the coast? A new crowdsourcing application developed at the USGS called, "iCoast-Did the Coast Change?" is designed to educate the public about how extreme storms can threaten homes, businesses, and infrastructure on our Nation's coast. The application allows citizen scientists to identify changes to the coast by comparing aerial photographs taken before and after storms. This crowdsourced data will help the USGS improve predictive models of coastal change while at the same time educate the public about coastal vulnerability.

USGS acquires high-resolution oblique aerial photographs at a low altitude along our Nation's coastlines to compare conditions before and after extreme storms. USGS uses these before-and-after images to ground truth and improve the coastal change probability models.

"Computers cannot yet automatically identify damages and geomorphic changes to the coast from the oblique aerial photographs," said Sophia B. Liu, USGS Mendenhall Postdoc Fellow. "Human intelligence is still needed to finish the job." The USGS decided to launch a citizen science project, asking citizens to help identify changes to the coast while also gaining knowledge about coastal hazards. "We designed iCoast to be a simple application that asks users to compare photos taken before and after a storm, and then identify changes they see using predefined keywords related to coastal hazards. This crowdsourced data can then be incorporated into the coastal hazard products and services at the USGS," said Liu.

The iCoast application shows an example of one task that asks users to look for changes they can see in the photographs that relate to the four coastal change processes, namely beach erosion, dune erosion, overwash, and inundation. Image credit: USGS. *http://www.usgs.gov/blogs/features/usgs_top_story/usgs-icoast-did-the-coast-change/?from=image*

Currently, these mathematical models are derived from dune elevation and predicted wave action during storms. Adding the human observations that can be extracted from the aerial imagery will allow the scientists to ground truth the models, and to provide better predictions of damage before storms occur.

"After an event like Hurricane Sandy there is always a great interest in our photographs," said Barbara Poore, USGS Research Geographer. "The USGS iCoast team hopes that the citizens who participate will learn about coastal change and about their personal vulnerabilities to extreme storms."

There are scientific, technological, and societal benefits to the iCoast project. It is a powerful way to illustrate the impacts of coastal change, and the crowdsourced data from iCoast will enhance predictive modeling of coastal erosion. This will help to better inform emergency managers, planners, and residents of coastal vulnerabilities in their regions. Teachers may also be interested in it as an interactive tool when covering coastal hazard topics.

USGS geologist, Karen Morgan, takes aerial photographs after hurricanes to help understand the impacts of extreme storms on coastal environments. Since 1995, the USGS has collected more than 140,000 aerial photographs of the Atlantic and Gulf coasts after 24 hurricanes and other extreme storms. Photo credit: USGS.

Learn how to use iCoast: *http://coastal.er.usgs.gov/icoast/*

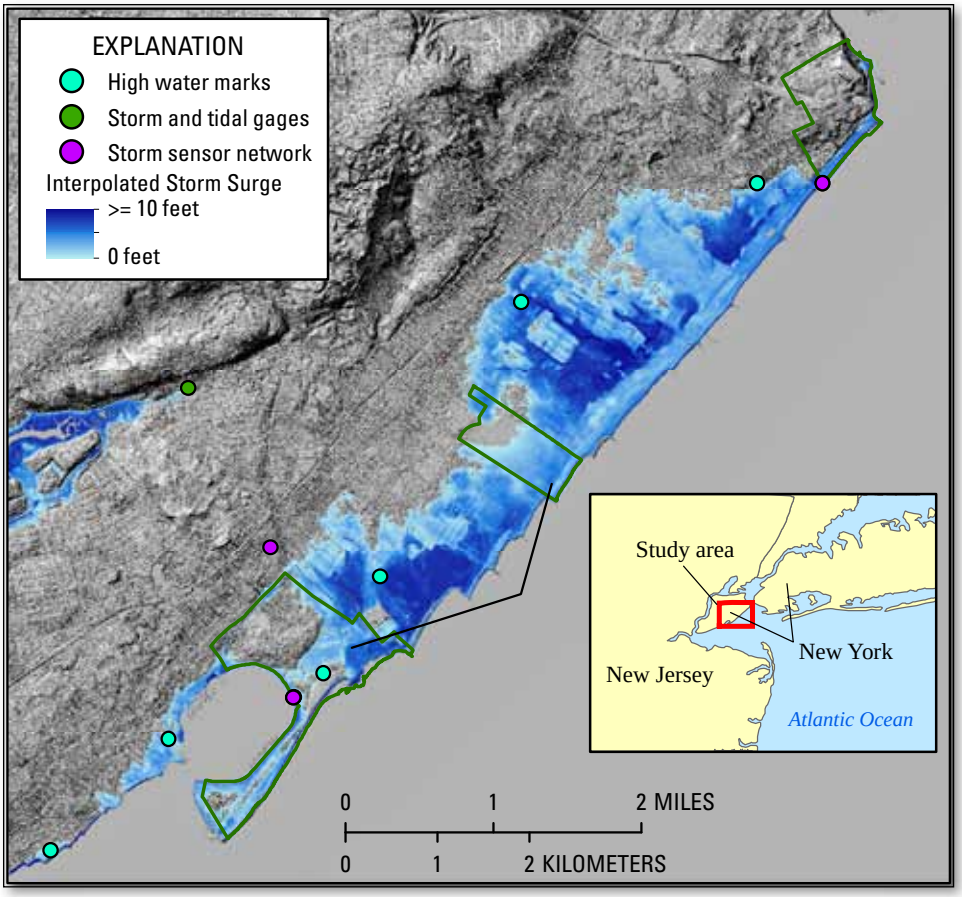
Storm Surge Workshop

USGS and the New York's College of Staten Island Convene Collaborative Team of Scientists

By Cindy Thatcher, USGS

The USGS Coastal National Elevation Database Applications (CoNED) Project team held a workshop in cooperation with and on the campus of the College of Staten Island-City University of New York (CSI-CUNY) to discuss storm surge modeling and get input from scientists across a broad community.

Scientists from federal agencies, academic institutions, and the insurance industry met on April 22-23, 2014. They shared state of knowledge on storm surge and wave modeling, topobathymetric elevation models (merged renderings of land and seafloor topography), how best to share input data and model results through establishing common data standards, new tools for visualizing storm surge model output, and techniques aimed at making surge model results more easily accessible to emergency managers, modelers, and other stakeholders.



This map of part of the south shore of Staten Island, New York shows the storm surge area, interpolated from peak storm-tide elevations measured from high water marks and storm-tide sensors. Data and image: USGS Hurricane Sandy Mapper and the FEMA Modeling Task Force.

Workshop attendees focused on optimizing elevation data and other lidar (LIght Detection and Ranging)-derived products for use in hydrodynamic models. Storm surge models are important tools for forecasting coastal vulnerability and risk and are critical to emergency managers, coastal planners, and other decision-makers.

The workshop also focused on the coordinated collection of the extensive storm surge monitoring data by USGS, NOAA, and others to document the magnitude and timing of hurricane storm surge. This information is critical for calibrating and assessing storm surge models, damage assessments, and improves inundation forecasts for future storms. USGS received valuable input on potential new geospatial products that would be useful to the storm surge researchers. These included raster maps of the landscape frictional "drag" coefficients derived from lidar point clouds that are needed to improve the modeling of wave attenuation

Storm surge models are being used to evaluate coastal protection plans and to better understand flood probabilities, which can help communities make smart coastal development decisions. Photo credit: Pat Bradey, College of Staten Island.

The south shore of Staten Island was hit hard by Hurricane Sandy in 2012, and the damage is still apparent in some areas. Photo credit: Jeff Danielson, USGS.

See Storm Surge page 20

BSEE Announces Funding for Oil Spill Response Research Systems in Drift Ice Conditions

The Bureau of Safety and Environmental Enforcement (BSEE) has announced targeted oil spill response research in drift ice conditions. The bureau called for white papers on new mechanical technologies for cleaning up oil spills in drift ice conditions found in an Arctic environment.

BSEE will select up to three designs for prototype development and testing at Ohmsett, the bureau's National Oil Spill Research and Renewable Energy Test Facility. This is the third broad agency announcement from BSEE for oil spill response research proposals within the last year. BSEE is the principal federal agency funding offshore oil spill response research. BSEE supports a robust research program that includes operation of Ohmsett, where many of today's commercially available oil spill cleanup products have been tested. Government agencies including the U.S. Coast Guard and the U.S. Navy as well as private industry and oil spill response organizations from around the world train their emergency response personnel with real oil and their own equipment at BSEE's Ohmsett facility in Leonardo, N.J.

Learn more about oil spill response research:
http://www.bsee.gov/Research-and-Training/Oil-Spill-Response-Research/index/

An aerial view of Ohmsett, the National Oils Spill Response Research Facility and premier training site for oil spill response personnel. Ohmsett is a key part of BSEEs Oil Spill Response Research Program. The research and training facility centers around a 2.6 million-gallon salt water tank. Some of the testing activities have included remote sensing tests, wave energy conversion device tests, skimmer and boom tests, dispersant tests, alternative fuel recovery tests, and industry oil spill response training classes. More than twenty-four countries have conducted tests or training at the Ohmsett facility. Photo credit: BSEE.

Map details coastal Louisiana marshes and vegetation types

The USGS released a map of coastal Louisiana marshes, listing more than 956,000 acres of fresh marsh and nearly 730,000 acres of saltwater marsh. The USGS, Louisiana State University, University of Louisiana at Lafayette, and the Louisiana Department of Wildlife and Fisheries Coastal and Nongame Resources Division jointly completed an aerial survey to collect data on 2013 vegetation types in coastal Louisiana. On the basis of species composition and abundance, each marsh sampling station was assigned a marsh type: fresh, intermediate, brackish, or saline (saltwater) marsh.
Link to the map: *http://pubs.usgs.gov/sim/3290/*

Storm Surge continued from page 19

across wetlands and forests. Tools for improving elevation data processing to make the production of maps and storm surge model outputs more accurate and efficient were also identified as a topic of future research during the workshop.

Dr. Alan Benimoff from the College of Staten Island led a field trip to the south shore of Staten Island to show attendees the extensive damage caused by the Hurricane Sandy storm surge. This real world exposure to community devastation due to hurricane storm surge provided a first-hand understanding of the importance of ongoing collaborative research activities that contribute to improving the resilience of the coastline to future storms.

http://marine.usgs.gov/
https://water.usgs.gov/floods/events/2012/sandy/sandymapper.html
http://www.csi.cuny.edu/

New Tool Available to Help Track Spilled Oil

Computer model can help with current, future clean-up efforts

A newly developed computer model holds the promise of helping scientists track and predict where oil will go after a spill, sometimes years later. U.S. Geological Survey scientists developed the model as a way of tracking the movement of sand and oil found along the Gulf of Mexico since the Deepwater Horizon oil spill. The new tool can help guide clean-up efforts, and be used to aid the response to future oil spills.

Following the Deepwater Horizon spill, denser-than-water conglomerates of sand and oil have been found in the surf zone, ranging in size from less than a millimeter to mats up to a few meters in size. The surf zone is where waves break as they approach the shore. The USGS study looked at conglomerates several centimeters thick – known as "surface residual balls," or "SRBs", which continue to emerge in some beach locations more than three years after the first oil reached the shoreline.

Applying the model to movement of SRBs along the coast of Alabama and western Florida showed that normal wave conditions, less than 1.5 to 2 meters, will not move centimeter-sized SRBs alongshore. However, tropical storms, or winter storms can mobilize and redistribute these SRBs alongshore.

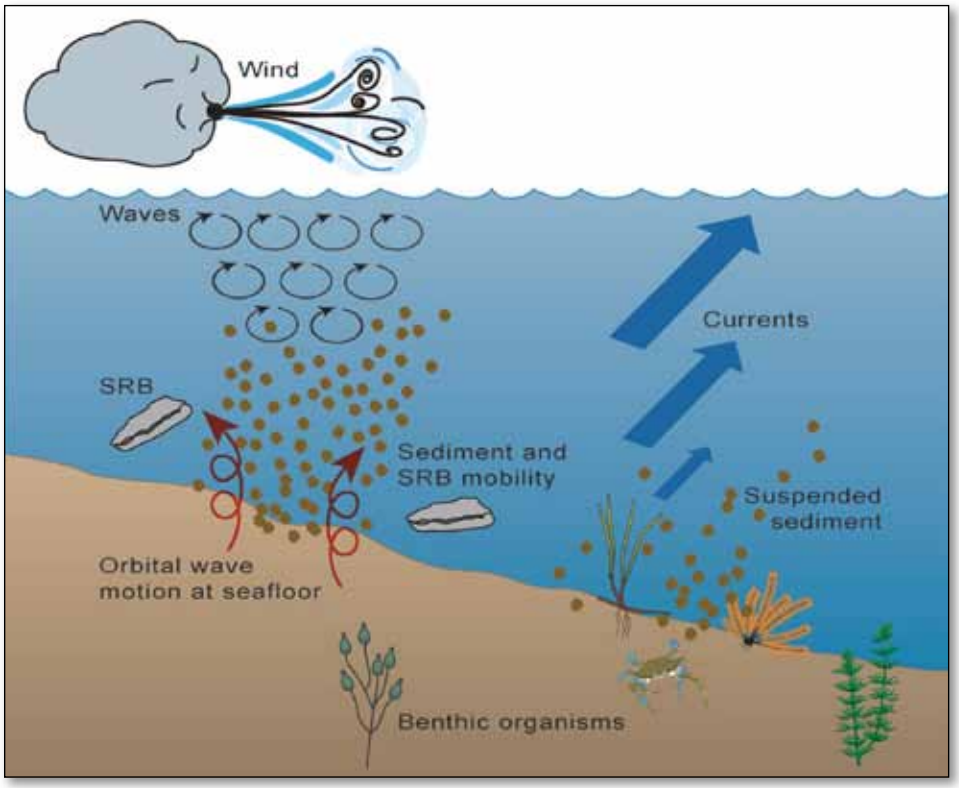
Published in Marine Pollution Bulletin, the report also shows that SRBs are likely to be covered and uncovered by sand that is relatively easily moved by waves and currents in the surf zone.

"SRBs are dense enough to rest on the seafloor, rather than floating. Because sand grains are smaller and more mobile than the larger SRBs, under non-storm conditions when the SRBs themselves are not moving, they can be buried and exhumed by mobilized sand," said Dalyander, In addition to providing guidance for the Deepwater Horizon clean-up effort, the USGS methodology has broader potential application.

"The techniques developed here can be applied to evaluate the potential alongshore movement of SRBs in other locations or from any future spill where large quantities of oil and sand mix in the surf zone", said P. Soupy Dalyander a research oceanographer and lead author of the study.
http://www.usgs.gov/newsroom/article.asp?ID=3795&from=rss_home#.U1l2LFfihbQ

A mixture of oil and sand formed a surface residual ball (SRB) approximately 2.5 cm in diameter, along the Gulf of Mexico shore. Photo credit: U.S. Coast Guard.

Masses of oil coated the beach and seaweed as it washed ashore at Bon Secour National Wildlife Refuge on the Gulf of Mexico coast in 2010. Photo credit: Jereme Phillips, USFWS.



Processes driving surface residual ball (SRB) and sediment mobility and transport along the Alabama and Florida Gulf coast. Wave- and current-induced shear stress can resuspend sand, SRBs, and other material from the sea floor, leading to potential transport by currents. Symbols used by permission from Integration and Application Network, 2012. Image source: USGS.

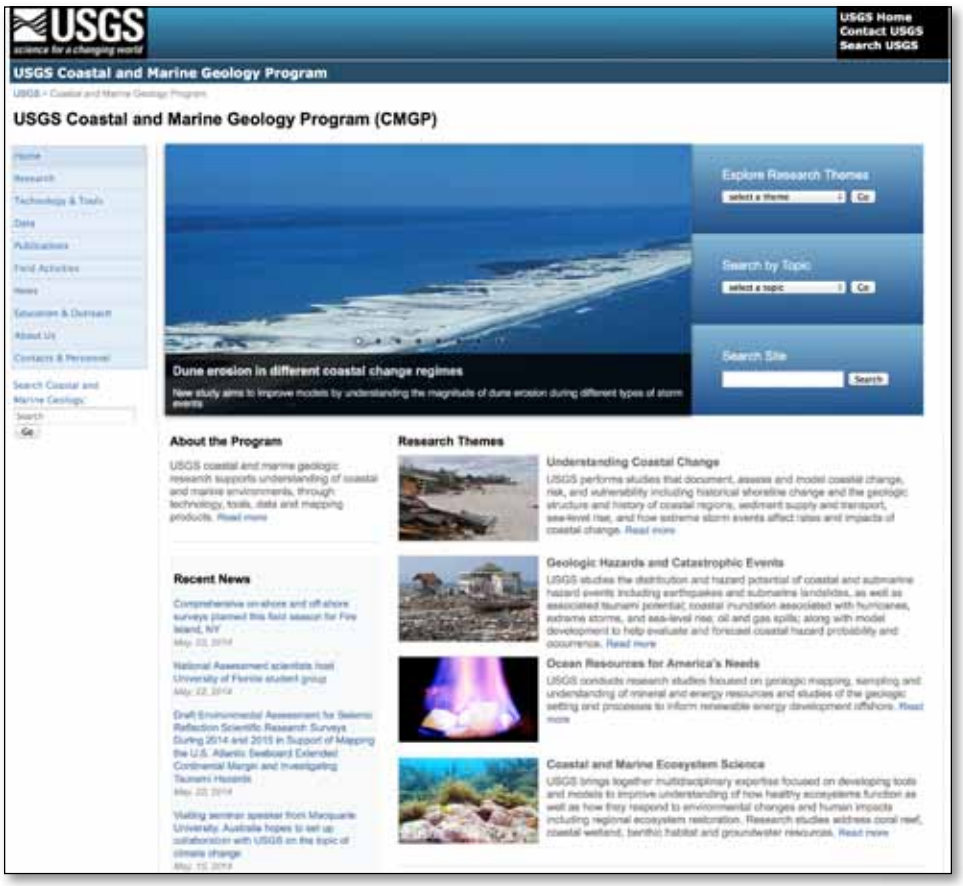
New Web Pages Open Doors

Coastal and Marine Geology Research Topics and Resources

http://marine.usgs.gov

By Jolene Gittens, USGS

The U.S. Geological Survey (USGS) Coastal and Marine Geology Program (CMGP) contributes to the greater USGS mission of providing impartial information on the health of our ecosystems and environment, the natural hazards that threaten us, the natural resources we rely on, the impacts of climate and land-use change, and the core science systems that help provide timely, relevant, and usable information.



The USGS Coastal and Marine Geology Program home webpage. Visit on-line to see the comprehensive research activities and resources. *http://marine.usgs.gov*

"We want partners and stakeholders to easily see what we do to support them– to find the tools and products they need. The Web is our front door. and these pages are one important piece of our strategy to help the public, agencies at all levels, and a diverse community of researchers find, access and apply our data and products to their needs and resource management issues," said USGS Coastal and Marine Geology Program Coordinator, John Haines.

Thematic and topical organizational structure improves access to current and historical coastal and marine research information, including research projects, laboratory and technical capabilities, field activities, data, publications, news, outreach activities, and personnel information. Current scientific research is organized along four major themes.

Understanding Coastal Change - a range of studies and information that document, assess and model coastal change, risk, and vulnerability including historical shoreline change and the geologic structure and history of coastal regions, sediment supply and transport, sea-level rise, and how extreme storm events affect rates and impacts of coastal change.

Geologic Hazards and Catastrophic Events - research about the causes, distribution and hazard potential of coastal and submarine hazard events including earthquakes and submarine landslides, as well as associated tsunami potential; coastal inundation associated with hurricanes, extreme storms, and sea-level rise; oil and gas spills; along with model development to help evaluate and forecast coastal hazard probability and occurrence.

Ocean Resources for America's Needs - research studies focused on geologic mapping, sampling and understanding of mineral and energy resources and studies of the geologic setting and processes to inform renewable energy development offshore.

Coastal and Marine Ecosystem Science - multidisciplinary expertise focused on developing tools and models to improve understanding of how healthy ecosystems function as well as how they respond to environmental changes and human impacts including regional ecosystem restoration. Research studies address coral reef, coastal wetland, benthic habitat and groundwater resources.

Want to find research projects? Browse the Research section by major research themes, see a list of all current research projects. Each research project includes a project

See USGS webpages page 23

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overview, descriptions of research themes and tasks, data products, publications, and contact information.

Want to learn about research techniques and tools? The Technology and Tools section describes the data collection tools, analytical techniques, and technologies utilized in coastal and marine studies. **Looking for data?** USGS serves up metadata catalogues, and a variety of lidar, seismic, sidescan sonar, bathymetry, gravity, magnetic, and other data. Access is provided via Open Geospatial Consortium (OGC) standards services; serving data to GeoMapApp and Virtual Ocean 2-D and 3-D earth browsing tools, for data integration, visualization and analysis. **Looking for maps and other publications?** A comprehensive list of publications and a direct link to available on-line publications. **Interested in field activities?** All CMGP field activities including dates, locations, chief scientists, and scientific objectives are posted. **Want to locate educational resources?** The Education and Outreach section shares a wide range of multi-media products to help explain and illustrate scientific concepts.

Please come visit, the "front door" is open. *http://marine.usgs.gov*

Read ***Sound Waves***, the USGS Coastal and Marine Geology Program's bimonthly newsletter, for in-depth articles about coastal and marine research.

soundwaves.usgs.gov

Above- Scientific diver, Alyssa Adler, measures structural relief of a hard-bottom reef populated by sponges, soft coral, and macroalgae. Photo credit: A. Paxton/UNC Institute of Marine Sciences.

Mapping Seafloor Habitats in Offshore Wind Energy Areas

The Bureau of Ocean Energy Management is partnering with UNC Institute of Marine Sciences and NOAA to produce habitat maps of marine resources, particularly seafloor habitats. The critical data is needed to inform potential wind development efforts offshore North Carolina and includes extensive seafloor mapping and a baseline biological assessment in the Wilmington - East Call Area. Researchers just returned from the biological/dive assessment cruise conducted from the NOAA ship Nancy Foster May 5-15.
Photos on-line:
https://www.flickr.com/photos/uncims/sets/72157644092936163

First Congressional Science, Technology, Engineering and Math Academic Competition at University of the Virgin Islands

By Karen Koltes, OIA

Jamila Martin, a senior at the University of the Virgin Islands (UVI), took first place in the first annual Congressional Science, Technology, Engineering and Math (STEM) academic competition. Jamila conducted her research on the bio-luminescence at Salt River Bay working with Dr. Bernard Castillo, a faculty member at UVI's St. Croix campus.

Dr. Castillo is a member of the inter-disciplinary team of scientists who have been working to understand the bio-luminescent phenomenon at Salt River Bay and make recommendations on how to protect it. The team included scientists from the Joint Institute for Caribbean Marine Studies, the consortium of universities who are partnering with the National Park Service and the Government of the Virgin Islands to build the Marine Research and Education Center (MREC) at Salt River Bay National Historical Park and Ecological Preserve. The study was funded by Interior's Office of Insular Affairs as part of planning the MREC.

At right- A scientific diver uses a transect tape along a shipwreck as part of fish, invertebrate, macroalgae, and structural relief surveys. Photo credit: A. Paxton, UNC Institute of Marine Sciences

Resilient Nation continued from page 4

U.S. Geological Survey-USGS

"The interdisciplinary expertise at USGS is supplying critical and foundational scientific research and tools needed by decision-makers, planners, tribes, and resource managers not only for recovery from Sandy but to better prepare us for future storms and other impacts from climate change such as sea-level rise. USGS supports our Nation's ability to prepare for hazards as well as manage vital resources at ecosystem scales so that risks to coastal communities and landscapes can be managed sustainably for future generations," said Dave Russ, USGS Northeast Regional Director.

USGS is advancing understanding of storm impacts at the ecosystem scale. Very high resolution elevation data from ongoing USGS lidar surveys support scientific studies related to hurricane impacts, recovery, and rebuilding; emergency response assessment and planning; post-Sandy coastal assessments; and other activities. New elevation data supports a national community of users through The National Map and the 3-Dimensional Elevation Program (3DEP).

Scientists continue to enhance capabilities in real-time forecasting of beach vulnerability to storms, sediment movement, and other drivers of coastal change as well as evaluating impacts on wetlands, dunes, and back-barrier estuaries. The development of the overland Surge, Wave, and Tide Hydrodynamics (SWaTH) network along the Atlantic Coast from Virginia through Maine, will provide more timely storm-surge and wave data to help predict storm surge impacts. Coastal managers and decision makers can use USGS tools to evaluate threats and to examine the sustainability of coastal features and their effectiveness at reducing vulnerability and enhancing coastal resilience.

Testing of sediment and tissue samples from coastal and aquatic environments in affected parts of New York and New Jersey will help understand impacts from storm-released contaminants and inform strategies for managing any that may have become trapped in bottom sediments of estuaries, harbors, or other nearshore environments where they may continue to pose threats.

Scientists are assessing storm impacts on coastal forests, wetland integrity and stability and storm impact on waterfowl and migratory birds. USGS science supports decisions for recovery, conservation, and sustainable management by resource managers with responsibilities under the Federal Endangered Species Act and the Migratory Bird Treaty Act, as well as with State and local authorities for the protection of native, commercial, and recreationally harvested fish and wildlife species.
See: *http://coastal.er.usgs.gov/hazard-events/sandy/*

Bureau of Ocean Energy Management-BOEM

"BOEM is actively engaged with 13 Atlantic coast states to help coastal communities recover from Hurricane Sandy and enhance resilience efforts for the future," said BOEM Acting Director Walter Cruickshank. "We are committed to working in a collaborative manner to help local communities withstand damage from future storms."

BOEM's Marine Minerals Program (MMP) is responsible for managing non-energy minerals (primarily sand and gravel) on the ocean floor in Federal waters of the outer continental shelf (OCS). BOEM received $13.6 million to: 1) evaluate OCS sand resources; 2) fund state cooperative agreements; 3) gain stakeholders' input; and 4) supplement broad-scale environmental monitoring. As stewards of OCS sand and gravel resources, BOEM has facilitated this use for long-term recovery and resilience of coastal areas damaged by Hurricane Sandy.

BOEM work ranges from individual projects to broad scale, regional, collaborative efforts to identify locations and quantities of suitable OCS resources. BOEM has conveyed sand for restoration of shorelines impacted by Sandy and has broad-scale efforts underway that include funding a study to collect geological and geophysical data along the Atlantic coast to identify new potential sources of sand and gravel resources. The Bureau is also funding cooperative agreements with Atlantic coastal states that will evaluate existing offshore sand resource data and identify data gaps that ultimately will help states with recovery, habitat restoration and long-term resilience planning. These agreements will provide a foundation for future sand identification and project-level activities. BOEM also is monitoring the long-term effects of dredging shoals on fish and benthic communities as another part of Sandy-related efforts. These types of studies will provide BOEM with valuable information on the impacts and recovery of OCS sand resource areas so that it can better manage use of these valuable and finite resources.
See: *http://www.boem.gov/Marine-Minerals-Program/*

Harmful algal bloom on Assateague Island National Seashore, Maryland. Photo Credit: Eric Vance, EPA.

Raising Awareness about HABs

The Environmental Protection Agency (EPA) is bringing together partners from many sectors to share technical information about research and monitoring of harmful algal blooms (HABs). The Centers for Disease Control, USGS, North American Lake Management Society, Woods Hole Oceanographic Institution, among others produced an online clearinghouse of HAB-related materials and resources: *http://www2.epa.gov/nutrientpollution/harmful-algal-blooms*; a webinar series featuring experts in public health, monitoring, and policy; a set of Public Service Announcements, a new website about the potential threat to pet health, and a social media campaign that includes infographics, photos, and statistics. The group is expanding the partner network, continuing the webinar series, and coordinating a "Grand Algae Tour" to visit major HAB sites to attract attention from the media and public health experts. Contact: Antonio Bravo at *bravo.antonio@epa.gov*

Regional News

The National Ocean Policy proposed Federal-State-Tribal partnerships for marine planning at regional levels. DOI leadership supports state-led regional ocean partnerships, as well as Federal-state-tribal partnerships for regional marine planning. Four geographic regions now have operational regional planning bodies: Northeast, Mid-Atlantic, Caribbean and the Pacific Islands.

Three other regions are close to joining the process – the South Atlantic, the Gulf of Mexico and the West Coast

Interior contacts and related links:

Gulf of Maine

Terry Holman (DOI), Susan Russell-Robinson (USGS)
(U.S.,Canada)
http://www.gulfofmaine.org/2/

The Gulf of Maine Council commemorates its 25th Anniversary in Halifax, Nova Scotia June 17 & 18 with a semi-annual meeting of councilors from governmental and non-governmental organizations. DOI's Terry Holman, Ocean and Coastal Activities Coordinator, will attend along with federal counterparts from EPA (Mel Cote) and NOAA (Ellen Mecray).

The Gulf of Maine Council on the Marine Environment Climate Network has launched a new quarterly e-bulletin with information on regional climate adaptation resources and events, and a new product jointly developed by US and Canadian meteorologists—the Gulf of Maine Region Quarterly Climate Impacts and Outlook (GOM Outlook). The GOM Outlook offers a snapshot of recent significant climatic events and anomalies; discusses impacts on the region's ecosystems and economy; and offers a forecast for the coming three months. Sign up to receive these e-publications: *http://www.gulfofmaine.org/2/climate-network-climate-outlook/*

Released: "Status of contaminants in the Gulf of Maine" Fact Sheet-
The fact sheet summarizes data from the Gulf of Maine for three key indicators - chemical contaminants in mussels, sediment contaminants & toxicity, and shellfish beds approved for harvesting. *www.gulfofmaine.org/2/esip-fact-sheets/*

Mid-Atlantic

Maureen Bornholdt (BOEM)
Leanne Bullin (BOEM)
(Maryland, New York, New Jersey, Delaware, Virginia)
midatlanticocean.org

The Mid-Atlantic Regional Planning Body (RPB) Mid Atlantic RPB concluded a series of in-person listening sessions in five states to provide an overview of the draft regional ocean planning framework. It also held its second in-person business meeting on May 20-21 in Baltimore, MD. During the meeting, the RPB approved the Framework for Regional Ocean Planning and discussed the timeline for developing a RPB workplan based on that framework. The RPB discussed a strategy to further engage Mid-Atlantic stakeholders in regional ocean planning, identified next steps and a timeline for regional ocean planning products and processes, and shared information about activities underway by RPB member institutions that are relevant for regional ocean planning.

Approximately 65 members of the public attended the meeting, and stakeholders provided input during the public comment opportunities. Meeting materials and summary are posted on the website along with all presentations. The draft stakeholder engagement strategy outline is available for public comment until July 15. See: *http://www.boem.gov/Mid-Atlantic-Regional-Planning-Body/*

South Atlantic

Eric Strom (USGS)
(North Carolina, South Carolina, Georgia, Florida)
www.southatlanticalliance.org

The Executive Planning Team met in Charleston, SC on May 1-2. Using resilience as a driver for regional priorities, the team is seeking input from other Regional Ocean Partnerships and subject matter experts on their experiences with resilience and their regional-scale approaches. Eric Strom presented resilience as referenced in the Executive Order 13653, "Preparing the United States for the Impacts of Climate Change" and potential relevance to the South Atlantic region.

Northeast

Bob LaBelle (BOEM)
Leanne Bullin (BOEM)
(Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut)
http://northeastoceancouncil.org/

The next Regional Planning Body meeting will be in Boston, June 25-26.

See Regional News page 26

Northern sea otters living off the coast of Washington state were infected with the same H1N1 flu virus that caused the world-wide pandemic in 2009, according to a new study. Photo credit: Tania Larson, USGS.

Sea Otters Can Get the Flu, Too

Study Shows Human H1N1 Pandemic Virus Infected Washington State Sea Otters

By Gail Moede Rogall, USGS

In partnership with Centers for Disease Control and Prevention

Northern sea otters living off the coast of Washington state were infected with the same H1N1 flu virus that caused the world-wide pandemic in 2009, according to the study by the U.S. Geological Survey and Centers for Disease Control and Prevention study.

During an August 2011 health monitoring project, USGS and CDC scientists found evidence that the Washington sea otters were infected with the pandemic 2009 H1N1 virus, although the exact date and source of exposure could not be determined. The findings suggest that human flu can infect sea otters.

"Our study shows that sea otters may be a newly identified animal host of influenza viruses," said Hon Ip, a USGS scientist and co-author of the study.

The researchers discovered antibodies for the 2009 H1N1 flu virus in blood samples from 70 percent of the sea otters studied. None of the otters were visibly sick, but the presence of antibodies means that the otters were previously exposed to influenza. Further tests concluded that the antibodies were specific to the pandemic 2009 H1N1 flu virus, and not from exposure to other human or avian H1N1 viruses.

"We are unsure how these animals became infected," said Zhunan Li, CDC scientist and lead author on the paper. "This population of sea otters lives in a relatively remote environment and rarely comes into contact with humans," said USGS scientist LeAnn White.

Sea otter sampling was performed by a collaboration of the USGS National Wildlife Health Center, USGS Alaska Science Center, USGS Western Ecological Research Center, Monterey Bay Aquarium and Seattle Aquarium.

The USGS and the Interior Department work with CDC and other state and federal partners on research to help provide an early warning to the agriculture, public health and wildlife communities, as well as to the public.

The study is published in the journal, Emerging Infectious Diseases.

http://www.usgs.gov/newsroom/article.asp?ID=3864&from=news_side#.U0Wr2sRDtIk

Regional News continued from page 25

Caribbean
Sherri Fields (NPS)
(Puerto Rico, U.S. Virgin Islands)

Pacific Islands
Richard Hannan (USFWS)
(American Samoa, Commonwealth of Northern Mariana Islands, Guam, Hawaii)

Gulf of Mexico
Linda Walker (USFWS)
(Alabama, Florida, Louisiana, Mississippi, Texas)
www.gulfofmexicoalliance.org

West Coast
Joan Barminski (BOEM)
Ellen Aronson (BOEM)
(California, Washington and Oregon)
www.westcoastoceans.org

Great Lakes
Phyllis Ellin (NPS),
Norman Grannemann (USGS)
Charlie Wooley (USFWS)
(Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, Wisconsin)
www.epa.gov/glnpo/glri/
www.cglg.org/

Alaska/Arctic
Jim Kendall (BOEM)
(Alaska)

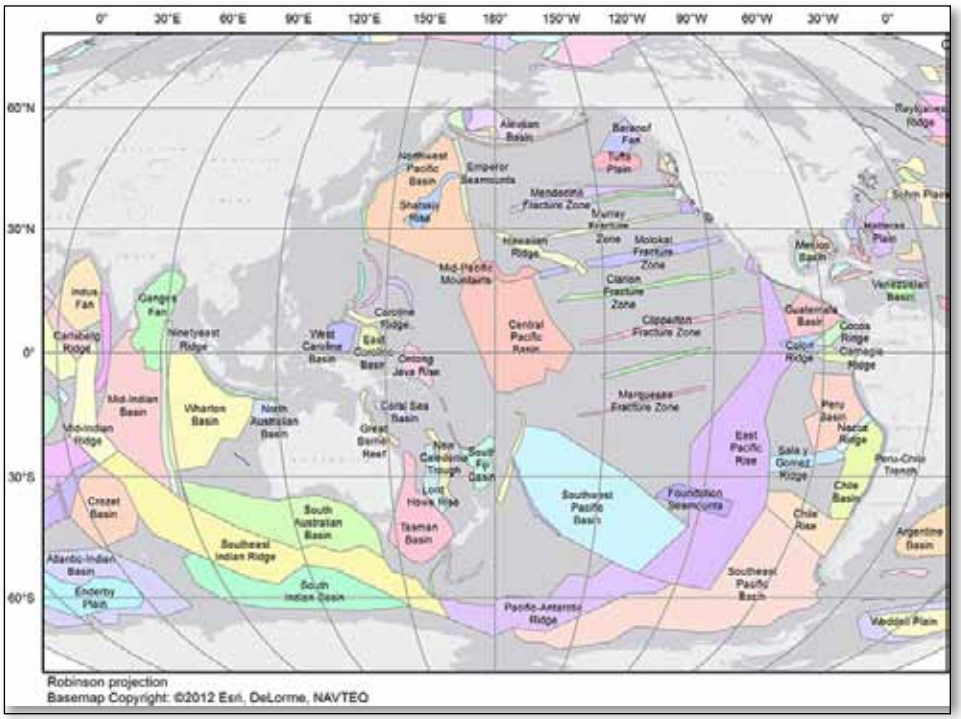
New Geospatial Data Products for Ocean and Coastal Features

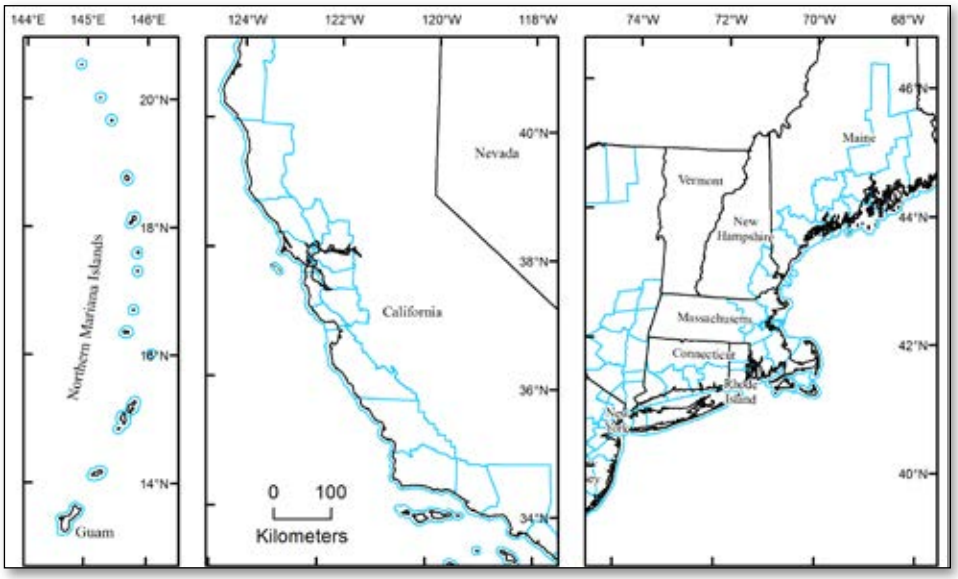
The USGS Coastal and Marine Geology Program has produced a set of geographic polygons to help people find scientific information about the ocean. The two new data reports help geospatial data communities search and retrieve georeferenced information specific to coastal zone and marine regions.

The USGS compiled and processed shapefiles to describe oceanic and coastal features such as named oceans and seas, undersea features, coastal features, waterways, and relevant administrative areas including the U.S. Exclusive Economic Zone (EEZ) and Coastal Zone Management Program (CZMP) counties.

Polygons of Global Undersea Features for Geographic Searches, provides polygonal footprints for more than 300 undersea features, large and small, including ridges, rises, trenches, fracture zones, banks, basins, seamount chains, and abyssal plains. Geospatial information systems that can search irregular geographic areas will be able to utilize these polygons to retrieve georeferenced information resources. Many of the footprints will also be incorporated in the General Bathymetric Chart of the Oceans (GEBCO) Gazetteer of Undersea Feature Names and in the GEOnet Names Server maintained by the National Geospatial-Intelligence Agency. *http://pubs.usgs.gov/of/2014/1040/*

Shapefile for Coastal Zone Management Program Counties, 2009, provides polygonal footprints for Coastal Zone Management Program (CZMP) counties in the U.S. states and territories, derived from the U.S. Census Bureau MAF/TIGER counties database for 2009. The report also describes a simple procedure that end users of the CZMP counties shapefile can use whenever updates become necessary because of name, boundary, or other substantial changes affecting these counties. The county polygons in this database extend offshore to the traditional 3-nautical-mile limit, which approximates the seaward boundary of the coastal zone for most states. *http://pubs.usgs.gov/of/2013/1284/*





Above- This global map shows selected geospatial polygons (footprints) for undersea features like the Aleutian Basin, the Molokai Fracture Zone and the East Pacific Rise (above). These polygons were created after examining historical bathymetric maps, digital data and scientific literature. Below- Polygonal footprints for Coastal Zone Management Program (CZMP) counties in the U.S. states and territories, derived from the U.S. Census Bureau MAF/TIGER counties database for 2009. (Image source: USGS)

Learn more: *http://www.ngdc.noaa.gov/gazetteer/*

http://earth-info.nga.mil/gns/html/

Water Runs Through the Nation
USGS "Streamer" on-line tool
Access data and information with a click on a map.

http://nationalmap.gov/streamer/webApp/welcome.html

The Surfing Bison

Our Nation's waterways play a vital role in the health of downstream and ultimately coastal areas. As each stream flows toward the coast it carries with it evidence of activities taking place within its watershed.

"Streamer" allows you to explore our Nation's stream networks and learn more about the watersheds they run through.

This tool provides quick access to National streamflow-related information on one website.

A few examples:

At left- The upstream trace of the Susquehanna River from the Chesapeake Bay showing the river and tributaries extending from Maryland into Pennsylvania and New York. Real-time streamflow gaging stations are shown as small colored dots.

Below- The "Streamer" map using the satellite basemap view option showing the national network of gaging stations with real-time flow conditions (colored dots). Source images: USGS

Stay in Touch with your Waterways

"Streamer" is easy to use. Locate gaging stations, watershed tributaries and extent, real-time conditions for streamflow and weather, and more!

- View base as map or satellite imagery.
- See locations of real-time streamflow stations across the country.
- Quick access to streamflow conditions (above, below, or at normal levels) at each USGS streamgaging station.
- Real-time weather radar displayed across all 50 States.
- Hourly updates of streamflow information with colored symbols that illustrate current conditions as compared with each station's observed mean streamflow on the same day of the year.
- Direct links for additional information and data for selected stations.
- Names of waterbodies (lakes, reservoirs, etc.) along the path of your trace.
- Detailed information from the Census Bureau on political boundaries such as states, counties, congressional districts and additional information about socioeconomic conditions in each district.
- Searchable by place name, zip code, geographic coordinates and more.