



NEWSWAVE

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

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This issue of NEWSWAVE includes examples of Interior programs engaged in restoring and strengthening connections with watersheds and local communities that benefit our Nation’s estuaries and coasts.

Fall 2012

Dam Removal on the Elwha River

Already manifesting signs of new life as the watershed is reconnected to the sea

By Barbara Wilcox, USGS

One year after crews began to take down two obsolete dams on the Elwha River in Washington State, the unprecedented restoration is already manifesting such signs of new life as fish hatchlings, tree saplings and the beginnings of beaches.

The responses are part of the ongoing restoration study by U.S. Geological Survey (USGS) scientists and their state, Federal and tribal partners. The Elwha River runs through Olympic National Park

Elwha See page 22



Secretary Salazar participated in a ceremony this summer marking the removal of the Great Works Dam on the Penobscot River in Maine – a major step toward enabling the river to flow freely from Old Town to the Gulf of Maine. Ecosystem responses to removing dams in the Elwha river watershed are highlighted in this issue. Photo credit: Tami Heilemann, DOI.

Interior’s River Initiative

“All American Rivers” Restoration Projects Benefit Coastal and Ocean Waters Too

By Caitlin Fong and Chris Eng

Rivers are a critical part of the endless water cycle. Rain that falls in the mountains starts a journey through tiny streams that ultimately flow into our Nation’s mightiest rivers, discharging along our coasts. This perpetual cycle ties even our most interior lands to the health of our coasts and oceans.

See River Initiative page 9



Aerial view of the mouth of the Elwha River near Port Angeles, Wash. Photo credit: Tom Roorda, Northwestern Territories Inc.

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

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www.estuaries.org/conference

6th National Conference on Coastal and Estuarine
Habitat Restoration, October 20-25, 2012 Tampa
Convention Center, Tampa, Florida

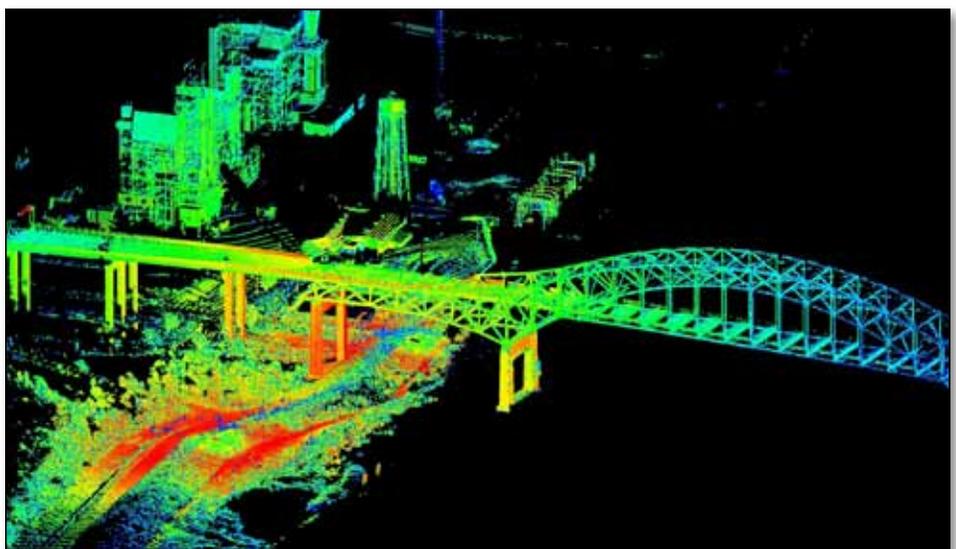


Marc Blouin prepares a drill tower for geologic coring in support of a climate change study in South Florida. Photo credit: USGS. See related story page 13.

New Video: Return of the Gentle Giants: Huron-Erie Corridor Fish Habitat Restoration

Learn about restoring vital fish habitat in the Great Lakes region. Footage includes lake sturgeon spawning on the new reef habitats even before the construction was complete. See related story page 10.

<http://www.youtube.com/watch?v=LKzollX4Z50&feature=youtu.be>



This image is a 3-D terrestrial LIDAR scan of Interstate 510 in New Orleans, Louisiana on August 31, 2012 during Hurricane Isaac. This new technology is being used by USGS to map flooding in urban areas. <http://www.usgs.gov/newsroom/article.asp?ID=3389&from=rss#.UHSH9i7pfgd>

A Day in the Life as an “Island Keeper”

Refuge interns share their summer experience at a National Wildlife Refuge

By Zoë Diaz-Martin and Amidia Frederick

Note: Zoe and Amidia were stationed at “Outer Island” within the Stewart B. McKinney National Wildlife Refuge, Connecticut

On graduation day, like millions of other college students finishing up their bachelor’s degrees and entering the real world, both of us pondered the same question: “what will become of us in these hard times?” Yet, the Stewart B. McKinney National Wildlife Refuge on coastal Connecticut has given us the gift of time to contemplate our futures and to decide what to do in this world. Most importantly, it has provided us with lots of practical experience that we can use if we choose to pursue full-time work in the field of natural resources.

When we tell people our titles are “Island Keepers” with the US Fish and Wildlife Service, we get responses mixed with awe and laughter. In reality, a day in the life of an “Island Keeper” is filled with both. No day here is exactly the same. Our duties are varied but we are mainly responsible for greeting the public, leading interpretive tours and environmental educational programs, aiding with maintenance projects and managing invasive vegetation. One day might consist of pulling Japanese Knotweed, while another is painting a building or showing local inner-city kids the wonders of the island and intertidal zone. We especially enjoy environmental education and seeing the faces of school children light up as they conquer their fears



Island Keepers from left, Amidia Frederick and Zoe Diaz-Martin at Outer Island. Below, a typical view from Outer Island, part of the island system in the Stewart B. McKinney National Wildlife Refuge, Connecticut, Photo credit: Shaun Roche, USFWS

<http://www.fws.gov/refuges/profiles/index.cfm?id=53546>



and collect Asian shore crabs into small buckets. As part of a new inventory of the island’s birds and vascular plants; we have identified some species that had not yet been recorded here.

Being an island keeper requires you to be a flexible self-starter and have a sense of humor. It is a once-in-a-lifetime opportunity that gives you hands-on experience with applied environmental science in the natural resources field. It is also a chance to do some island living daily astounded by the sheer beauty of the Thimble Islands. Most of all, it is satisfying to work toward conserving areas that are important to wildlife in the north-eastern United States.

Wanted:

Enthusiastic individuals to spend their summer on an island off the coast of Connecticut gaining valuable work experience in the natural resource field.

Refuge interns will spend three months assisting with important tasks like invasive species management, wildlife and vegetation surveys, nest counts, fencing/posting habitat, pollinator monitoring, working with threatened and endangered bird species, interacting with the public by conducting interpretive tours and educational programs, and assisting with island maintenance projects on the property. Applicants must be able to work in all kinds of weather, over different types of terrain and with biting insects.

Learn more about the USFWS “Island Keeper” program:
http://www.fws.gov/refuges/news/Island%20Keepers%20Needed_01032012.html

Restoring Coastal Wetlands Adds Value to Silicon Valley

Interior Supports Collaborative Spirit in South San Francisco Bay

By Ben Young Landis

“Restoring ecosystem processes and functions in these important shorelines of the South Bay benefits not only fish and wildlife, but the people and communities who live in and visit the surrounding areas,” said Interior Assistant Secretary of the Interior for Water and Science Anne Castle, who toured the project earlier this year. “The strong alliance of federal, state, local and private partners, including the U.S. Fish and Wildlife Service (USFWS) and U.S. Geological Survey (USGS), is ensuring that the beautiful and productive Bay, which attracted a vibrant population to live and work next to it, is protected and restored so that its many benefits are preserved.”

The South Bay Salt Pond Restoration Project has strong community support through local cities and utilities, such as the Santa Clara Valley Water District and the Alameda County Flood Protection Agency, as well as from U.S. Senator Dianne Feinstein and philanthropies such as the Packard, Hewlett and Moore foundations. These dependable friends and partners are critical to the planning and success of the 15,000 acre restoration project. The entire South San Francisco Bay area stands to reap the economic benefits, which include recreational opportunities, enhanced flood protection, new wildlife habitats, as well as construction and research jobs.

Now in its ninth year, the South Bay Salt Pond Restoration Project



Anne Castle, Interior Assistant Secretary of the Interior for Water and Science, visits the South Bay restoration team. Left to right: Cheryl Strong, wildlife biologist with USFWS Don Edwards San Francisco Bay National Wildlife Refuge, Laura Valoppi, biologist with USGS Western Ecological Research Center and lead scientist for South Bay Salt Pond Restoration Project, Anne Castle, and John Bourgeois, Executive Project Director for the South Bay Salt Pond Restoration Project. Photo credit: Ben Young Landis

is the largest wetland restoration initiative on the U.S. West Coast. Directed by the State of California’s Coastal Conservancy agency, the restoration progress rests heavily on collaborative involvement from two Interior bureaus: USGS and the USFWS.

“In a project of this scale and at this unique location, we have to account for a complex set of past and future ecological and human factors,” says John Bourgeois, executive project manager of the project for the Coastal Conservancy. “How will mudflats and the wildlife they support be affected by the restoration? What will happen to the toxic mercury from legacy mining stirred up by channel scour? Will sediment transport be sufficient to naturally rebuild these marshes? These are some of the questions that management expertise from USFWS and scientific research from USGS are helping us with.”

Bourgeois and colleagues have an important task at hand: deciding how much of the 15,000 acres to

restore back to marshes and what percentage to retain and reengineer as managed ponds — and how to accomplish both using smart, adaptive management strategies.

Thanks to the South Bay Salt Pond Restoration Project, however, some of these evaporation ponds have recently been opened up to bay waters for the first time in about 100 years, while the others are now managed ponds for shorebirds and waterfowl instead of salt production. A series of aerial images taken by Cris Benton shows the natural process of ecological succession from barren salt pans to marsh vegetation.

“But this isn’t some black-and-white, simple decision process where we say, ‘let’s convert everything back to marshes,’” explains Laura Valoppi, a biologist with the USGS Western Ecological Research Center who serves as research coordinator for the overall restoration.

U. S. Coral Reef Task Force Meeting in American Samoa

"Building Resilience into Coral Reef Conservation"

By Liza Johnson

American Samoa's Governor Togiola Tulafono and Interior's Deputy Assistant Secretary of Fish and Wildlife and Parks Eileen Sobeck co-hosted the U.S. Coral Reef Task Force (USCRTF) annual meeting in Pago Pago, American Samoa, August 17-23, 2012. USCRTF members met together to discuss the 2013 work-plan and share recent accomplishments, coral conservation efforts, existing challenges and needs in addressing coral reef research on local and global scales, including an update on the petition to list 82 species of coral under the Endangered Species Act and the newly formed Regional Ocean Partnerships in the Pacific Islands and Caribbean regions. The meeting also examined resilience and response of coral reefs and coastal communities to disasters as well as climate change. The members passed a resolution that formalized the Watershed Partnership Initiative (WPI). The WPI focuses on addressing priority issues and promoting interagency activities that improve watershed conditions and coral reefs. The resolution also prioritized community engagement to ensure that watershed management strategies facilitate the blending of cultural and traditional ecological knowledge and western science approaches.

The meeting included a business meeting, specific issue-related side meetings, and field site visits. Governor Togiola, serving his last term as Governor gave welcoming remarks. Eileen Sobeck and Eric Schwaab (NOAA) co-chaired the meeting. Dr. Steve Palumbi of Stanford University gave a keynote presentation on coral reef resilience in American Samoa.

Several USCRTF members attended site visits at two of the selected priority watershed sites: the West Maui Ka'anapali Watershed in Hawaii and the Faga'alu Watershed in American Samoa. Members discussed key threats to the watersheds, existing watershed restoration efforts, and the role of key community partners.

While in American Samoa, Sobeck met with field staff from the National Park of American Samoa, Rose Atoll Marine National Monument, and the Office of Insular Affairs to discuss issues of coral reef health, invasive species, watershed restoration, marine protected area management, community engagement and outreach, and local culture.

The next USCRTF meeting to be held in February, 2013, in Washington, DC will focus on the National Ocean Policy implementation, the Endangered Species Act, and the USCRTF Watershed Partnership Initiative.

Learn more: <http://www.coralreef.gov/>



USCRTF steering committee members soak up cultural, historical, and environmental background about the National Park of American Samoa and the island of Ofu from Lelei Peau, native of Ofu and the USCRTF's American Samoa Point of Contact. Photo credits: Liza Johnson



USCRTF members and staff from DOI, EPA, NOAA, USACE, and USDA met with the Watershed Partnership Initiative (WPI) program coordinator and local non-profit groups to tour the West Maui Watershed.



USCRTF members visited sites within the Faga'alu watershed (the third project selected as part of the USCRTF's Watershed Partnership Initiative). Here they inspect a stabilized stream that may provide a pathway for sediment and other contaminants to enter the coastal waters.

BOEM Continues Arctic Habitat Studies

Scientists Begin New Phase of Chukchi Sea Research

The Bureau of Ocean Energy Management (BOEM) announced the next steps in an important study of the Hanna Shoal area in the Chukchi Sea offshore Alaska to advance the focused effort of incorporating new scientific and environmental information throughout the implementation of the Five Year Outer Continental Shelf (OCS) Oil and Gas Leasing Program for 2012-2017. It is part of Interior's commitment to science-based resource management in the Arctic.

The three-week expedition in August 2012, was part of a long-term study of marine life in the Hanna Shoal area in the northeast Chukchi Sea. Previous studies of Hanna Shoal have documented sustained benthic productivity, accompanied by high concentration of water birds, walrus, and whales. This study will help identify and measure important physical and biological processes that contribute to the high concentration of marine life in this area, advancing BOEM's understanding of environmental considerations such as food web dynamics and potential contaminant bioaccumulations.

The new information will help inform BOEM's future resource management decisions in the Arctic. As discussed in the Final Oil and Gas Leasing Program for 2012-2017, BOEM has developed a focused leasing strategy for the Arctic that is specifically designed to identify areas with significant oil and gas resource potential while minimizing possible conflicts with environmentally sensitive areas.



Pacific Walrus and Black-legged Kittiwakes on Chukchi Sea ice. Almost 1700 walrus were seen during a two-to-three hour period on August 19 along the south side of the Hanna Shoal. Photo credit: Kathy Kuletz, USFWS.

This research supports ongoing efforts to further develop and aggregate scientific information to identify both areas that may be made available for oil and gas leasing and areas that may be deferred under this targeted leasing model.

“We are taking a cautious approach to any future leasing in the Arctic and scheduled Alaska sales later in the Five Year Program to allow for the continued development of exactly this kind of scientific information,” said BOEM Director Tommy P. Beaudreau.

Over the course of the Hanna Shoal study, which runs until 2016, scientists will identify and measure important physical and biological processes that contribute to the high concentration of marine life in the area. Work will include documenting physical and oceanographic features, ice conditions and information concerning local species.

The Hanna Shoal project will consist of more than 30 sampling



BOEM physical oceanographer Dr. Heather Crowley, left, and Kimberly Powell, University of Alaska Fairbanks graduate student, sort benthic organisms collected with the trawl. Photo credit: Deanna Wheeler, BOEM Hanna Shoal Ecosystem Study; PolarTREC Program.

stations, including selected stations from previous research. The investigation team consists of a uniquely qualified group from the University

Eastern Neck National Wildlife Refuge:

A Place for Community Stewardship and Environmental Education

By Laura Bankey, Director of Conservation, National Aquarium

The Eastern Neck National Wildlife Refuge, part of the U.S. Fish and Wildlife Service's National Wildlife Refuge System, is located at the confluence of the Chester River and the Chesapeake Bay on Maryland's Eastern Shore. This 2,285-acre island refuge is a major feeding and resting place for migrating and wintering waterfowl. More than 100,000 ducks, geese and swans seek sanctuary here each year, as do migrating and breeding songbirds and shorebirds, and bald eagles that thrive here year-round.

The Refuge and its partners offers multiple recreational opportunities as well as opportunities for public engagement in stewardship activi-



A student volunteer holds two ribbed mussels, a shellfish species that thrives in the restored habitat. Photo credit: National Aquarium.



Community volunteers and partners planting native marsh grasses along a newly resored tidal marsh on the Eastern Neck National Wildlife Refuge. Photo credit: National Aquarium.

ties and environmental education for nearby schools.

Since 2000, the National Aquarium has been working with USFWS staff, federal, state, corporate, academic and local volunteers to restore native habitats on the refuge as parts of its Chesapeake Bay Initiative. To date, more than 12 acres of tidal wetlands and forested buffers have been restored by removing invasive species and planting more than 145,000 native plants.

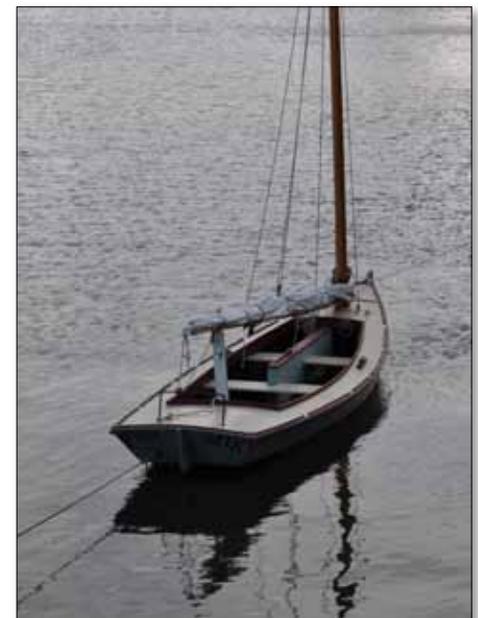
Joint initiatives have included a living shoreline project on the southern end of the island at Hail Cove, multiple tidal wetland restoration projects along the western edge of the island, development of a kayak trail that circumnavigates the refuge, and installation of a native BayScape garden and nature trail at the visitor's center. Students participating in the Aquarium's Wetland Nursery or Terrapins in the Classroom Programs also visit the refuge to take part in restoration activities as well as learn about the island ecosystems.

The mission of the National Aquarium is to inspire the conservation of the world's aquatic treasures.

Public wildlife refuges are such treasures, special places where wildlife is managed and protected for future generations, a place to connect with the natural world. Involving the public through restoration and environmental education on refuge property engages the community in enjoying and protecting the shared resources of our public lands.

Learn about a National Wildlife Refuge near you: <http://www.fws.gov/refuges/index.html>

Learn more about your public lands: www.publiclandsday.org



Coral Research Project Wins Partnership Award

Study focused on deepwater coral communities

By Marjorie Weisskohl, BOEM

The National Oceanographic Partnership Program (NOPP) Office (*see related story page 11*) awarded the 2011 ‘Excellence in Partnering’ Award to the team managing the project known as *Lophelia II* on October 15. This project was a 2008 NOPP-funded project titled, “Exploration and Research of Northern Gulf of Mexico Deepwater Natural and Artificial Hard Bottom Habitats with Emphasis on Coral Communities: Reefs, Rigs, and Wrecks.”

The project was nominated for its exceptionally diverse partnerships which include “scientists, graduate students, technicians, public outreach professionals, and industry specialists from a very broad spectrum of ocean sciences ranging from Federal regulating agency scientists to academic scientists to industry partners.”

Dr. Charles Fisher from Pennsylvania State University and Dr. James Brooks from TDI Brooks International, Inc. led the project with Bureau of Ocean Energy Management (BOEM), U.S. Geological Survey (USGS), and the National Oceanic and Atmospheric Administration (NOAA) as the funding agencies.

The Deepwater Coral Ecosystems Project began in 2008 and brought together numerous cooperating groups and leading scientists to explore and study poorly understood deep-water or “cold-water” coral communities and shipwrecks in the deep Gulf of Mexico. They conducted scientific exploration and discovery in water depths ranging



At left-A coral community atop a structure piling adjacent to a subsea oil and gas structure at a depth of about 1,500 ft was discovered as part of the NOPP-funded study referred to as *Lophelia II*. Red laser beams, projected from the ROV, represent a separation of 10 centimeters (about 4 inches). *Lophelia* coral colonies and anemones are abundant. The project team also placed a marker on top of the piling with a plastic ball of known dimensions for use as a size reference.

Below- An orange basket starfish sits atop *Lophelia* corals at a depth of 1,476 ft. Photo credits: *Lophelia II* 2012 Expedition, NOAA/BOEM.

from 1,000 to 9,000 ft. The project included research at three different kinds of deepwater habitat: natural reefs, shipwrecks and offshore energy platforms. In addition to scientific and management goals, a major component was educational outreach to allow the general public and especially children to experience and learn about these unique features and ecosystems.

The *Lophelia II* team completed their last research mission in

the Gulf of Mexico this summer where they discovered *Lophelia* coral growing deeper (2,620 ft) than previously seen in the Gulf. This newly available information will inform future environmental reviews and decision-making.

Learn more: http://www.oceanleadership.org/2012/nopp-announces-excellence-in-partnering-award-winner/?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+OceanLeadership+%28Consortium+for+Ocean+Leadership%29&utm_content=FaceBook



River Initiative continued from page 1

Water transporting sediment, nutrients, pathogens, and other pollutants picked up along the way can affect not only the health of our rivers, coasts and oceans, but the health of our communities. Migratory species like salmon can carry ocean nutrients back up rivers and into watersheds.

America's Great Outdoors Initiative (AGO), launched in 2010, by President Obama is a 21st-century approach to conservation that recognizes how the health of natural resources are interconnected with our human communities. Led by the Departments of Interior (DOI), Agriculture, the Environmental Protection Agency, and the Council on Environmental Quality, the AGO Initiative recognizes that the best conservation solutions start with the American people.

During public listening sessions held across the country, Americans repeatedly voiced their support for river stewardship.

On May 22, 2012, Secretary Salazar announced that the Elwha River Dam Removal was selected as the All-American-Rivers project for the State of Washington.

Press release: <http://www.doi.gov/news/pressreleases/Salazar-Highlights-10-Projects-in-Pacific-Northwest-and-Western-States-as-Americas-Great-Outdoors-Rivers.cfm>

In response, Secretary of the Interior, Ken Salazar, established the Rivers Initiative, prioritizing river conservation and recreation throughout DOI. The Initiative improves coordination and communication among government agencies



A group of stand-up paddleboarders (SUPs) from a non-profit organization called Below the Surface, celebrate the 40-year anniversary of the Clean Water Act by exploring the Anacostia River outside Washington, DC. Photo credit: Ann Tihansky.

and communities; encourages new policies, programs and projects that conserve river resources; increases recreational access; and develops lasting strategies for long-term river conservation and recreation objectives. The Rivers Initiative has three strategic priorities for achieving these goals:

Show the Way by demonstrating successful and innovative approaches to river conservation and recreation through the “All American Rivers” projects that show how federal and states agencies, and local communities can work together to achieve specific, tangible river conservation and recreation outcomes.

Make it Easier by providing tools and services to governmental agencies, communities, and other stakeholders to improve the planning and implementation of river conservation and recreation projects. For example, DOI is developing the National Rivers Atlas, which is a geospatial watershed planning tool for local communities. DOI is also developing online tools and resources that will facilitate partnerships and communication.

Inspire Involvement by celebrating partnership successes. Projects

like the Elwha River in the State of Washington, where scientific partners USGS, NPS, US Fish and Wildlife Service (USFWS), NOAA and the Lower Elwha Klallam Tribe are working together to reopen over 70 miles of historic salmon habitat (*see related story page 1*).

Through the Rivers Initiative, DOI is forging long-term partnerships, engaging local communities, and providing innovative technological and management approaches. Communities of river conservation and recreation practitioners are critical support for local efforts that restore and reconnect Americans with their treasured riverways.

For more information: <http://www.doi.gov/Americas-Great-Outdoors-Highlighted-River-Projects.cfm>.



Habitat Restoration Provides Hope for Great Lake Fish Species

By Sandra Morrison, USGS

“The science said: ‘If you build it, they will come,’ but we hardly could have dreamed of such an enthusiastic reception to this newly created rocky habitat for sturgeon and other native fish of the Great Lakes,” said US Geological Survey (USGS) Director Marcia McNutt. “This success gives us hope.”

Led by Michigan Sea Grant, the Middle Channel Reef Project is supported by the National Oceanic and Atmospheric Administration, the U.S. Fish and Wildlife Service, the Great Lakes Restoration Initiative (GLRI) through Environmental Protection Agency (EPA), and the Huron-Erie Corridor Initiative (HEC) partners. USGS scientists developed a model to predict where to build fish habitat that enhances fish reproduction and rebuilds native fish populations (including lake sturgeon, lake whitefish, and walleye) in the channel connecting Lakes Huron and Erie. “The fact that we are already observing sturgeon spawning on the Middle Channel Reefs helps validate the science that guided the planning, design and location of this project,” said Dr. Jennifer Read, Assistant Director of Michigan Sea Grant and Principal Investigator of the Middle Channel Reef Project.

Through collaborative support, the USGS has also developed a “blueprint” for fish spawning habitat restoration in the HEC that helps identify and prioritize future restoration sites. These restoration efforts are a key part of the EPA efforts to remove Beneficial Use Impairments and eventually delist the St. Clair and Detroit River Areas of Concern.

Learn more: <http://huron-erie.org/>



The lake sturgeon, a fish native to the Great Lakes region and listed as threatened or endangered in several states, has already been observed spawning in the newly created rocky habitat of the “Middle Channel Reef” project. Photo credit: Arleen Elkins, USGS.

Urban River Project Adds Value to Chesapeake Bay’s Watershed and Coastal Communities

By Caitlin Fong and Chris Eng, USFWS

Flowing through our nation’s capital, the Anacostia River has experienced decades of urbanization, and has been ranked as one of the most polluted rivers in the country. Through partnerships with the U.S. Fish & Wildlife Service’s Coastal Program, D.C. Department of the Environment, Natural Resources Conservation Service, and numerous other local organizations, the Watts Branch Stream Restoration project, is part of a large-scale watershed restoration of the Anacostia River, the “Forgotten River.”

A watershed-based approach method was used to assess conditions and used a natural channel design method to restore 1.8 miles of stream and riparian habitat along Watts Branch. The project restored a stable, self-sustaining stream with diverse aquatic habitat and reduced bank erosion. The project also had a strong urban renewal component, which connected low-income urban neighborhoods to their local waterway, creating a healthier community with a stronger sense of stewardship. The effort invested nearly three million dollars in the local economy by supporting jobs in manufacturing, surveying, construction, restoration, planting and maintenance of the habitat. The project served as an outdoor classroom for the D.C. Green Corps, an innovative job training program, created by Washington Parks and People, <http://www.washingtonparks.net/>, an alliance of community urban park partnerships. D.C. Green Corps provides access to environmental careers in urban and community forestry and forest-based ecosystem and watershed restoration. The project serves as a model for using innovative techniques and partnerships in future urban restoration efforts. The far-reaching impacts downstream improve both the resource health of the Anacostia River, Chesapeake Bay and the watershed communities that rely on them. Rebecca Wodder, Senior Advisor to Secretary Salazar, said, “It has been exciting to see the many ways local communities can benefit from the combined aspects of river restoration and recreation.”

Building the National Oceanic Partnership Program--

Creating a community that fosters advances in ocean science, technology, and education

By Allison Miller, Consortium for Ocean Leadership and Rodney Cluck, BOEM

The National Oceanographic Partnership Program (NOPP) was created in 1997 by the U.S. Congress as a collaborative way for Federal agencies to provide leadership and coordinate national oceanographic research and education initiatives. By bringing the public and private sectors together, the NOPP facilitates interactions among Federal agencies, academia, and industry. The partnership also increases visibility for ocean issues on the national agenda and achieves a higher level of coordinated effort across a broad oceanographic community. This leadership promotes resources sharing and fosters community-wide innovative advances in ocean science and technology. The community can then support larger, more comprehensive projects that benefit all participants. The cumulative investment in research through NOPP reached over \$549 million between 1997 and 2011.

Such collaborative work enhances the sustainability of ocean and coastal economies by sound scientific information that helps balance the myriad of demands on coastal and ocean resources. Planning in the marine environment heavily relies on partnerships at all levels throughout the Federal government as well as on the regional scale where many plans will be implemented. NOPP has been guiding and facilitating these



types of partnerships for almost fifteen years working to leverage resources on ocean-related topics. Many topics are interdisciplinary with multiple stakeholders sharing similar interests. For example, in 2010, the Bureau of Ocean Energy Management, the Department of Energy, and the National Oceanic and Atmospheric Administration collaborated on a funding solicitation aimed at advancing offshore renewable energy by addressing the need for environmental information such as protocols and monitoring.

The three agencies collaboratively funded the eight research projects highlighted below. They were led by Cornell University, Pacific Energy Ventures, University of Massachusetts Dartmouth, University of Washington, University of Texas-Austin, University of Arkansas, Parametrix, and University of Rhode Island respectively.

Characterization and Potential Impacts of Noise Producing Construction and Operation Activities on the Outer Continental Shelf, http://www.boem.gov/uploadedFiles/BOEM/Environmental_Stewardship/Environmental_Studies/Renewable_Energy/Characterization-PotentialImpacts.pdf

Protocols for Baseline Studies and Monitoring for Ocean Renewable Energy, http://www.boem.gov/uploadedFiles/BOEM/Environmental_Stewardship/Environmental_Studies/Pacific_Region/Studies/PC-10-x12.pdf

Roadmap: Technologies for Cost Effective, Spatial Resource Assessments for Offshore Renewable Energy, http://www.boem.gov/uploadedFiles/BOEM/Environmental_Stewardship/Environmental_Studies/Renewable_Energy/AT%2010-x14%20Roadmap%20for%20Technologies.pdf

Evaluating Acoustic Technologies to Monitor Aquatic Organisms at Renewable Energy Sites, [http://www.boem.gov/uploadedFiles/BOEM/Environmental_Stewardship/Environmental_Studies/Renewable_Energy/EvaluatingacoustictechnologiesRESites\(1\).pdf](http://www.boem.gov/uploadedFiles/BOEM/Environmental_Stewardship/Environmental_Studies/Renewable_Energy/EvaluatingacoustictechnologiesRESites(1).pdf)

Developing Environmental Protocols and Monitoring to Support Ocean Renewable Energy and Stewardship, http://www.boem.gov/uploadedFiles/BOEM/Environmental_Stewardship/Environmental_Studies/National/NT10x32.pdf

Visual Impact Evaluation System for Offshore Renewable Energy, http://boem.gov/uploadedFiles/BOEM/Environmental_Stewardship/Environmental_Studies/Pacific_Region/Studies/PC-10-08.pdf

Bayesian Integration Marine Spatial Planning and Renewable Energy Siting, http://boem.gov/uploadedFiles/BOEM/Environmental_Stewardship/Environmental_Studies/Pacific_Region/Studies/PC-10-x13.pdf

Developing Environmental Protocols and Monitoring to Support Ocean Renewable Energy and Stewardship, <http://www.boem.gov/uploadedFiles/AT-10-x16a%20Protocols%20and%20Modeling%20Tools.pdf>

Responsive Federal Mapping Tool Expanded to Arctic

A new federal interactive online mapping tool (ERMA®) used by emergency responders during the Deepwater Horizon oil spill has been expanded to include the Arctic, and will help address numerous challenges in the Arctic posed by increasing ship traffic and proposed energy development.

National Oceanic and Atmospheric Administration (NOAA) and the Department of the Interior's Bureau of Safety and Environmental Enforcement (BSEE), called the Environmental Response Management Application, known as ERMA®, an important step forward for the Arctic region.

"We are committed to a comprehensive, science-based approach to energy policy in the Arctic," said Deputy Secretary of the Interior David J. Hayes. "This initiative is part of the Administration's commitment to continuing the expansion of safe and responsible production of our domestic resources and is an exciting step forward in our efforts to collect, synthesize and deliver relevant information to decision-makers."

"The addition of Arctic ERMA will be a tremendous benefit to responders in this rapidly developing region," said Jane Lubchenco, under secretary of commerce for oceans and atmosphere and NOAA administrator. "This scientific tool could provide essential information in responding to potential oil spills and pollution releases in the Arctic."

"I know first-hand how critical it is for emergency responders to have the common operating pic-



At right, Eileen Sobeck, Interior's Deputy Assistant Secretary for Fish and Wildlife and Parks as well as co-chair of the National Ocean Policy's Ocean Research Management-Interagency Policy Committee, participated in a panel discussion at the Coastal States Organization (CSO) annual meeting in September. Other panel members (from left): Braxton Davis, North Carolina Coastal Program Manager and CSO Past Chair; Pete Johnson, Deputy Director of the Council of Great Lakes Governors; Betsy Nicholson, Northeast Lead, NOAA Coastal Services Center (hidden from view); and Donald Schregardus, Deputy Assistant Secretary of the Navy for Environment. Photo credit: Diana Bowen, CSO.

ture ERMA provides," said BSEE director James A. Watson. "With the potential for oil and natural gas development, as well as increased shipping activity offshore Alaska, it is essential that responders have access to real-time information that provides full situational awareness. That's why I'm so pleased that BSEE was able to partner with NOAA to help complete this invaluable application."

ERMA brings together all of the available information needed for an effective emergency response in the Arctic. In an emergency situation, ERMA is equipped with near real-time oceanographic observations and weather data from NOAA, and critical environmental, commercial, and industrial data information from BSEE, and numerous other federal and state response agencies. Responders can further customize the tool with environmental, logistical, and operational data such as fishery closure areas, resources at risk

Interior Shares Perspectives at Coastal States Organization 42nd Annual Meeting

Eileen Sobeck (DOI) and Don Schregardus (USN), the National Ocean Policy's Ocean Research Management-Interagency Policy Committee co-chairs, were invited to discuss the National Ocean Policy at the Coastal States Organization (CSO) 42nd Annual Meeting in Huron, OH, September 24 -27. Sobeck pointed out benefits of the policy, with a key advantage being the increased coordination and collaboration among Federal agencies. She is encouraged that this collaboration will continue as it improves our ability to accomplish tangible results, specifically as the Regional Planning Bodies (RPB) become established. Betsy Nicholson, NOAA, discussed the progress and status of the Northeast RPB and Pete Johnson from the Council of Great Lakes Governors discussed activities taking place in the Great Lakes Region.

See ERMA page 23

SCUBA DIVERS:

A Critical Workforce For Interior's Oceans, Coasts, Rivers and Great Lakes

By Ann Tihansky

Work in our ocean, coasts, estuaries, rivers and Great Lakes often requires getting beneath the surface to thoroughly evaluate and monitor these watery resources. Many of these underwater duties require specialized technical diving skills due to challenging environmental conditions, complex tasks, or both.

SCUBA divers at the U.S. Geological Survey (USGS), Bureau of Safety and Environmental Enforcement (BSEE) and Bureau of Ocean Energy Management (BOEM) have formed well-trained teams to accomplish a diverse set of tasks that integrate the stewardship mission with high-quality safety training.

The USGS Dive Team includes nearly 200 divers scattered across the U.S. Led by Dive Safety Program Manager Marc Blouin, this team has contributed significantly to a number of scientific studies ranging from climate change, coral disease, current velocities, bridge scour, invasive mussels, fish habitat, sea otters, sea turtles, habitat mapping, drilling, and hydrology in caves and springs. This work often challenges the divers to design and develop specialized



BSEE dive team member Charles Barbee trains underwater near the sunken aircraft carrier USS Oriskany. Photo credit: BSEE.

techniques, tools and innovative sampling devices. For example, a patent application has been filed on a new device used to evaluate fishery habitats in the Colorado River at Glen and Grand Canyons, in Arizona.

Blouin works with these teams to develop safety support for divers working in submarine environments that include low visibility, cold water, high velocity currents and potentially aggressive marine animals. The USGS dive-safety program developed a low-visibility training module that is used by many institutions worldwide. USGS divers also participate with the US Coast Guard in multi-agency training initiatives for rescue lifesaving and dive accident management to help guarantee everyone is prepared for emergencies.

The BSEE dive program, led by Federal Preservation Officer and Diving Safety Officer Christopher Horrell, conducts annual recertification dives that improve diving skills and increase BSEE's capabilities in the water. The dive team consists of scientists and seasoned investigators, and conducts field investigations that facilitate a clearer understanding of the various resources the Bureau is charged with inventorying and protecting as the nation's offshore energy portfolio continues to grow on the Outer Continental Shelf.

Using a "Science-based Compliance" approach, BSEE's dive program, an entity within the Seafloor Compliance, Assessment, and Monitoring Program (SCAMP), conducts several tasks including: 1) site investigations, 2) verifying damages to natural and cultural resources, 3) assessing mitigation effectiveness, 4) documenting and issuing incidents of non-compliance, 5) determining potential civil and criminal penalties for non-compliance, and identifying and documenting newly identified resources.



At left, USGS field dive officer, Glen Black, operating a suction sampler (patent pending), used to collect periphyton and invertebrates for a collaborative fisheries habitat project. Photo by Marc Blouin, USGS.

Mid-Atlantic Deepwater Canyons Expedition

The Mid-Atlantic Deepwater Canyons expedition is continuing to explore deep sea communities in a series of three research cruises. The project, co-funded by Interior's Bureau of Ocean Energy Management and the U.S. Geological Survey, and NOAA's Office of Ocean Exploration, and managed by Continental Shelf Associates, also includes scientific partners from several academic institutions. The USGS DISCOVERE (Diversity and Connectivity of Vulnerable Reef Ecosystems) team will investigate the biology and ecology of deepwater canyons off the eastern coast of the United States. Scientists will be examining the microbial associates of deep-sea corals and the microbial diversity present in soft sediments, neither of which has ever been explored in these canyons. They will also be deploying setting plates to look at the microbial biofilms that form on various substances (limestone, sandstone, steel), since those biofilms determine which macrofauna will later colonize rocky outcrops or shipwrecks. Other aspects of study include studying coral population genetics, benthic ecology, foodwebs, and paleoclimate using coral skeletons.

Keep up with the expedition through Mission Logs, Photo Gallery, and the Ocean Explorer Deepwater Canyons 2012 News Feed: <http://oceanexplorer.noaa.gov/explorations/12midatlantic/welcome.html>
More: <http://fl.biology.usgs.gov/DISCOVERE/index.html>



Locations of the five mid-Atlantic canyons off the Delaware peninsula that are part of the Deepwater Canyons Expedition; from south to north: Norfolk, Washington, Accomac, Baltimore and Wilmington, are shown in a Google Earth image available: http://fl.biology.usgs.gov/DISCOVERE/discovere_gmap_MAC.html

SCUBA continued from page 13

BSEE's Environmental Enforcement Division enjoys a solid relationship with the BOEM dive program working in concert with BOEM and other federal dive programs to foster inter-agency cooperation, as well as engaging in further training and enhancing the dive team's capabilities. This past year, the team, joined by divers from BOEM, conducted a training exercise on the sunken aircraft carrier USS Oriskany, the battleship USS Massachusetts, a vessel known as the Russian Freighter, and an artificial reef called Three Barges, all off Florida's northwest coast. During this exercise they conducted diver rescue training and limited visibility and entanglement drills along with learning to use a new underwater camera.

Interior (NPS, USFWS, USGS) has also participated in one of the longest snorkel surveys (42 miles)

ever completed in North America with divers from the Lower Elwha Klallam Tribe, the National Oceanic and Atmospheric Administration, Peninsula College and the Wild Salmon Center. The underwater trip began just above Chicago Camp and ended at the Straits of Juan de Fuca west of Port Angeles, WA. This survey provided vital baseline data before dam removal began. It will improve understanding of the salmon recolonization process and guide future monitoring efforts. The USGS Seattle dive team is leading the follow-up monitoring part of the study, partnering with divers from the EPA and the Elwha Tribe in the largest project of it's kind in the country (*see related story page 1*).

At right-Hydrologists from the Water Science Center in Orlando, FL, set up a device to monitor water flow velocity. Photo by Marc Blouin, USGS.

See more SCUBA action:

<http://www.nps.gov/olym/naturescience/Elwha-Snorkel-Survey-2007.htm>

<http://www.nps.gov/olym/parknews/elwha-river-snorkel-survey.htm>

<http://www.bsee.gov/BSEE-Newsroom/BSEE-News-Briefs/2012/BSEE-Dive-Team.aspx>

http://www.boem.gov/uploaded-Files/BOEM/BOEM_Newsroom/Library/Bulletin/03-2012.pdf

Restoring the Elwha

River: http://gallery.usgs.gov/photos/06_18_2012_aEUh8LJww6_06_18_2012_1#.UGNtoWDn12A





Two fish species facing extinction. The Slender Chub (top) has not been seen since 1996 and may be the next species to be considered possibly extinct in North America. The Pygmy Sculpin (bottom) is a southeastern fish that is only known to occur in one location, a spring. Photo credit: Noel Burkhead, USGS. sefishescouncil.org

North American Fish Extinctions May Double by 2050

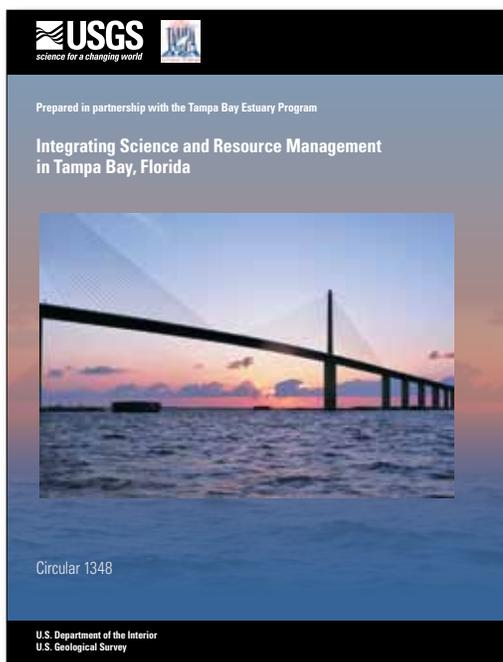
By Rachel Pawlitz, USGS

A new study by the U.S. Geological Survey, “Extinction Rates in North American Freshwater Fishes, 1900-2010,” was published in the September issue of the journal *BioScience*. The study finds that North America lost 39 species and 18 subspecies between 1898 and 2006. From 1900-2010, freshwater fish species in North America went extinct at a rate 877 times faster than the rate found in the fossil record. Based on current trends in threatened and endangered fish species, researchers estimate that an additional 53-86 species of freshwater fish may be extinct by the year 2050.

Natural causes of fish extinction are linked to transitions in landforms and continental watercourses over time, but many twentieth century extinctions were caused by dams, channelization of rivers, water pollution, and other human-induced factors.

<http://www.usgs.gov/newsroom/article.asp?ID=3315#.UD-oEJFuJz0>

Scientific Research: A Key Foundation for Restoring Tampa Bay



USGS publication highlights solid foundation of scientific research and partnerships.

Nanette O'Hara, Tampa Bay Estuary Program

Tampa Bay is among the most well-studied estuaries in the nation thanks to a strong collaboration among bay area scientists and hands-on managers that stretches back more than 30 years. In addition to research supported by the Tampa Bay Estuary Program (TBEP), its local partners and academic institutions, the U.S. Geological Survey (USGS) has conducted a far-ranging suite of research in the bay in the past decade. Key findings are featured in a joint publication of the USGS and the TBEP along with examples of how the research has been used to drive management solutions.

USGS Scientist Kim Yates, TBEP's Executive Director Holly Greening and Hillsborough County's Environmental Resources Management Division Director Gerold Morrison, co-edited USGS Circular 1348, “*Integrating Science and Resource Management in Tampa Bay, Florida.*” The publication demonstrates how science has been critical

to the developing and implementing successful management strategies through the public, government, academic and private partnership working in Tampa Bay.

Chapters cover the natural history of the bay and its physical characteristics; changes brought about by development; seagrass restoration; water quality; freshwater inflows; sediment contamination and benthic health; and habitat protection and restoration. Taken together, they present a comprehensive synthesis of what scientists have learned about Tampa Bay, and how the Tampa Bay science community has collectively used that knowledge to advance bay recovery goals. “The progress we’ve made in restoring Tampa Bay exemplifies how sound science can help guide successful and cost-effective management of an important urban estuary,” said Holly Greening, Executive Director of the Tampa Bay Estuary Program. “The combination of a very strong locally-based scientific community, enhanced by the U.S. Geological Survey’s research team, has contributed to a deep understanding not only of how Tampa Bay functions, but of the value of the bay to our region’s economy and quality of life.” The report is available online: <http://pubs.usgs.gov/circ/1348/>



Levees at Pond A21, near Fremont, Calif., were breached in 2006. This series of aerial kite photography shows the natural sedimentation processes and ecological succession of marsh vegetation to the previously barren salt pans. (upper left) Photo credits: Cris Benton. Dates for images, clockwise from upper left, April 2008, September 2009, October 2010, October 2011. <http://www.southbayrestoration.org/track-our-progress/island-ponds-before-after.html>

Salt Marsh continued from page 4

For example, some managed ponds are now important nesting and foraging grounds for federally listed waterbirds, like the Western snowy plover and the California least tern. “We can’t just tear down levees and flood out these threatened and endangered species,” says Valoppi. “And for tracts where we can restore tidal action, we have to figure out where to design openings in the levees to ease the ecosystem back

to functioning sediment and water flows.”

Establishing these tidal flows will naturally rebuild local marshes — key habitat for other endangered species like the California clapper rail and salt marsh harvest mouse.

These are only two of the uncertainties and science questions being investigated by a USGS science centers, including the Western Ecological Research Center, the Pacific Coastal and Marine Sci-

ence Center, the California Water Science Center and the National Research Program.

Valoppi is in charge of coordinating and synthesizing this USGS research and also compiling research conducted by a community of universities, consultants and nongovernment groups in the San Francisco Bay area who are all contributing to the restoration research.

“The project management team works closely with the principal investigators of the research projects, as well as local stakeholders,” says Cheryl Strong, a refuge biologist managing the bird habitat component of the restoration. “We can talk with our research colleagues, which is critical to how we evaluate and adjust our adaptive management plan as we move forward with the restoration.”

“Like the Bay ecosystem itself, this restoration is not a static process,” says Bourgeois.

Learn more: <http://www.southbayrestoration.org>



USGS studies are examining effects of restoration on breeding shorebirds like the black-necked stilt (above). Photo credit: Judy Irving, Pelican Media.

News from the Regions

Across the Nation, the Interior Department provides leadership and coordination for ocean, coastal and Great Lakes activities. Federal partners support state-led regional ocean partnerships and efforts to address common concerns within the regions.

There are nine regional planning areas:

- 1-The Northeast, 2- Mid-Atlantic,
- 3-South Atlantic, 4-Caribbean,
- 5-Gulf of Mexico, 6-West Coast,
- 7-Great Lakes, 8-Pacific Islands,
- 9-Alaska/Arctic.

Northeast Regional Ocean Council (NROC)

Bob LaBelle (BOEM)
(Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut)

<http://collaborate.csc.noaa.gov/nroc/default.aspx>

The U.S. Fish and Wildlife Service (USFWS), Bureau of Ocean Energy Management (BOEM), and the U.S. Geological Survey (USGS) have completed compiling all available historic records on marine bird distribution and abundance into a data base designed to help agencies assess whether or not these species are moving through the rotor swept zone to inform future wind power development decisions. USFWS is in year four of a five year project to fund observers on Ships of Opportunity to collect observations on marine birds, funded by BOEM. Through AMAPPS (Atlantic Marine Assessment Program for Protected Species), USFWS, Department of Navy, and the National Oceanic and Atmospheric Administration have been collaboratively gathering baseline information on the distribution and density of marine birds, sea turtles and other marine mammals. BOEM has funded a three-year diving duck satellite telemetry study which is being conducted by the USFWS, USGS and other partners to determine migratory movements of marine birds. This study will provide a more focused look at the highest priority



marine birds and how they move within the near-shore environment, in addition to gathering data on how far above the ocean surface birds are moving. The North Atlantic Landscape Conservation Cooperative has funded a project to take all of the available marine bird data collected for the North Atlantic and develop a predictive model that will identify areas that should not be developed for offshore wind energy.

Governor's South Atlantic Alliance (GSAA)

Eric Strom (USGS)
(North Carolina, South Carolina, Georgia, Florida)

<http://www.southatlanticalliance.org>

The Governors' South Atlantic Alliance (GSAA) has been working on a project entitled "Designing a Multi-State and Regional Framework for Ocean Planning and Decision Making". The Southeast Coastal Ocean Observing Regional Association (SECOORA) has taken the lead, and DOI agencies (USGS and NPS) are providing "relevant federal products, tools, experiences, and datasets for the project." The GSAA has four Issue Area Task Teams (1-Clean Coastal and Ocean and Waters, 2-Working Waterfronts, 3-Disaster Resilient Communities, and 4-Healthy Ecosystems). DOI has participating agencies on each one (USGS, NPS, FWS). The DOI has been contributing to mapping known distributions of key

estuarine and marine habitats, land-use cover in coastal watersheds, and distribution of key species of management concern using a common set of standards and attributes.

West Coast Governor's Alliance (WGCA)

Joan Barminski (BOEM)
(California, Washington and Oregon)

<http://westcoastoceans.org>

The WGCA held its annual meeting on August 27-28, 2012. At the meeting, the Executive Committee decided to revise its 11 Action Coordination Teams to reflect the re-visited priorities of the WGCA and to restructure the Executive Committee itself to include tribal representation. The relationship between the WGCA and the West Coast Regional Planning Body (RPB) was a key discussion topic at the meeting.

Gulf of Mexico Alliance (GOMA)

Linda Kelsey (USFWS)
(Alabama, Florida, Louisiana, Mississippi, Texas)

<http://www.gulfofmexicoalliance.org/>

USFWS currently serves as the DOI lead on the Alliance Management Team. also provides funding to support coastal wetlands restoration and for the acquisition of coastal wetland tracts. Florida, Alabama, Mississippi, and Texas have par-

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ticipated in the USFWS National Coastal Wetland Grants Program and received project funds that support GOMA's habitat restoration goals. Louisiana has its own Federally-funded wetlands restoration program in which USFWS and USGS play a major role. USFWS is working with GOMA to develop sea level rise models for all 47 National Wildlife Refuges along the Gulf coast. The Refuge System is also prioritizing potential land acquisition and conservation needs across the five Gulf States in support of the GOMA Gulf coast habitat restoration and conservation goals.

Mid-Atlantic Regional Ocean Council (MARCO)

Maureen Bornholdt (BOEM)
(Maryland, New York, New Jersey, Delaware, Virginia)
<http://www.midatlanticocean.org/>

BOEM is the Federal co-chair of the Regional Planning Body (RPB) for the Mid-Atlantic and is planning a stakeholder workshop in late November as an initial step to launch regional ocean planning in the Mid-Atlantic. MARCO and the Federal agencies engaged with ocean planning in the region will convene the workshop which is scheduled for November 27 and 28 at the Arlington campus of George Mason University in Virginia.

The Udall Foundation's Institute for Environmental Conflict Resolution recently presented a webinar on effective tribal relations for representatives from Federal agencies, Mid-Atlantic states (MARCO), and the Shinnecock and Oneida tribes. The Udall Foundation has offered to provide training sessions for federal agency representatives and RPB members on collaborative leadership training for ocean planning and stakeholder engagement.

Alaska

Jim Kendall (BOEM)
In the Alaska region, the United States Coast Guard is currently the federal co-lead for Coastal Marine Spatial Planning. DOI's Bureau of Ocean Energy Management (BOEM) will assume the leadership role in 2013.

Great Lakes Restoration Initiative (GRLI)

Phyllis Ellin (NPS), Norman Grannemann (USGS)
(Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, Wisconsin)
<http://www.epa.gov/glnpo/glri/>

USGS and the Huron-Erie Corridor Initiative (HEC) partners hosted a celebration to highlight the successful St. Clair River lake sturgeon and native fish habitat restoration and other HEC restoration successes. The event took place along the St. Clair River in Algonac, MI on August 28 and included the first showing of the "Return of the Gentle Giants: Huron-Erie Corridor Fish Habitat Restoration" video, a live sturgeon display, and legislative and agency representatives discussing HEC programs. USGS also hosted a boat tour of HEC research sites for EPA's Great Lakes National Program Office aboard R/V Muskie. www.huron-erie.org

The Huron-Erie Corridor (HEC) is the waterway that connects Lakes Huron and Erie through the St. Clair River, Lake St. Clair and the Detroit River. Map credit: Michigan Sea Grant.



Great Lakes Week 2012, took place in Cleveland, OH, September 10-14 with the theme, "Taking Action, Delivering Results," focusing public attention on efforts to rid the Great Lakes of toxic hotspots, reduce polluted runoff, restore fish and wildlife habitat, and prevent Asian carp and other invasive species from entering the lakes. Rachel Jacobson, Interior's Deputy Assistant Secretary for Fish and Wildlife and Parks, spoke during the Joint Session along with representatives from EPA and Environment Canada.

Learn more: www.glweek.org

Caribbean Regional Ocean Partnership (CROP)

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



Rachel Jacobson, Interior's Deputy Assistant Secretary for Fish and Wildlife and Parks, spoke about measurable outcomes being achieved under the Great Lakes Restoration Initiative. Photo credit: Peter Cassell, EPA.

Pacific Islands Regional Ocean Partnership (PROP)

Richard Hannan (USFWS)
(American Samoa, Commonwealth of Northern Mariana Islands, Guam, Hawaii)
Hawaii Governor Neil Abercrombie and the governors of American Samoa, the Commonwealth of the Northern Marianas (CNMI) and Guam signed the agreement for the Regional Ocean Partnership for Hawaii and the Pacific Islands-referred to as the Pacific ROP, or PROP. <http://hawaii.gov/gov/newsroom/press-releases/u.s.-pacific-islands-collaboration-sets-framework-for-regional-ocean-partnership>

DOI participants gave PROP board members an informal, brief introduction to DOI and ocean resource-related issues such as marine planning. Don Palawski (USFWS-Refuges) presented an overview of issues important to the Refuge complex in the insular Pacific, Dave Helweg (USGS) gave an overview of DOI organizational structure, National Park and Refuge management units in the insular Pacific, and science and technology capabilities available to support the PROP's goals. Ellen Aronson and Joan Barminski (BOEM) presented an overview of the BOEM mission and capabilities. Copies of a BOEM overview fact sheet and the 2010 DOI CMSP workshop report (U.S. Geological Survey Open-File Report 2011-1152) were provided to board members.

Arctic Habitat continued from page 6

of Texas at Austin, Florida Institute of Technology, the University of Maryland, Old Dominion University and the University of Alaska Fairbanks, who conducted previous research in the area, along with additional researchers from the University of Rhode Island and the Woods Hole Oceanographic Institution. The researchers used the US Coast Guard Cutter Healy as their research platform.

The research builds on BOEM's recently published major study, "Chukchi Sea Offshore Monitoring in Drilling Area (COMIDA): Chemical and Benthos (CAB)," <http://www.data.boem.gov/PI/PDFImages/ESPIS/5/5182.pdf>, which establishes updated baseline information on the biological and chemical characteristics of the Chukchi Sea planning area. Through work conducted during two field seasons in 2009 and 2010, scientists characterized the



Above, sampling equipment aboard the USCGC Healy, used to collect specimens from the sea floor, including, left to right, multi-Haps core, box core, double Van Veen grab, with missile-shaped gravity cores at each end. Photo credit: Kathy Kuletz, USFWS.

chemical and biological environment of the seabed prior to any anticipated oil and gas exploration activities. BOEM manages the exploration and development of the nation's offshore energy and mineral resources. The Bureau seeks to balance economic devel-

opment, energy production, and environmental protection through oil and gas leasing, renewable energy development and environmental reviews and studies.

BOEM's Environmental Studies Program: <http://www.boem.gov/studies/>.



An array of benthic sediments and organisms collected for study from the sea floor about 130 feet deep on the Hanna Shoal in the Chuckchi Sea. Biological specimens seen here include a purple rose starfish with 10 arms (lower right), various other starfish/sea stars, brittle stars, purple sea cucumbers, several types of crabs, pink and orange soft corals, and feathery filter feeders known as bryozoans. Larger rocks are covered with white barnacles. Photo by Heather Crowley, BOEM.

You can download USGS video:

"Wetlands Revival"

A documentary film exploring the role of science in restoring salt ponds to wetland habitat in south San Francisco Bay.

See related story page 4.



<http://www.werc.usgs.gov/ProductDetails.aspx?ID=3935>

Scientists Track Trends of Coastal Change Along Northern Gulf of Mexico

By Kate Bradshaw

Extreme storms historically have battered barrier islands along the northern Gulf of Mexico coastline. Hurricanes Ivan (2004) and Katrina (2005) left both Dauphin Island (AL) and the Chandeleur Islands (LA) vulnerable to future storms like Hurricane Isaac, which hit the region in August 2012. Scientists with the USGS's Coastal Marine Geology program used historical baseline information and monitoring data to predict the coastal changes likely to occur in this vulnerable area as a result of Isaac's landfall. Decades of information, combined with storm surge models and up-to-date predictions of Isaac's track from the NOAA's National Weather Service, enabled scientists to accurately forecast where beach and dune erosion, overwash, and inundation would occur.

"We can now combine more accurate coastal data with powerful new scientific models to provide the very best predictions of hurricane surge, waves, and erosion," said USGS Director Marcia McNutt.

Hurricane Isaac made landfall near New Orleans and although it was not as strong as Katrina, its slow movement built up storm surge which intensified its impacts on coastal elevations. One hundred percent of the Chandeleur Islands, a narrow chain of uninhabited islands, situated within Breton National Wildlife Refuge, experienced overwash conditions. Eighty-three percent of the islands were completely inundated, which further reduced island elevations.

RESTORE ACT: Restoring the Gulf of Mexico

The 2012 Resources and Ecosystem Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act (RESTORE).

The Gulf Coast Region is a large, diverse landscape, ecologically rich due to coastal geomorphology, climate, hydrology, and connection to a productive marine environment. The area is of great cultural, historic and economic importance as reflected in ports, coastal communities, trade, agriculture, seafood harvest, energy production and tourism. Congress passed the **RESTORE Act** to create a Gulf Coast Restoration Trust Fund to support the Gulf recovery from environmental and economic injuries resulting from decades of oil and gas development in the region, including impacts from Deepwater Horizon.

Interior manages 3.5 million acres on 45 national wildlife refuges and eight national park areas from Texas to Florida and oversees nearly 160 million acres of public lands offshore. Bureaus share a broad range of responsibility for natural and trust resources-migratory birds, marine mammals, anadromous fish, 132 species listed under the ESA - as well as for coastal barrier islands, science support and research leadership, ocean energy, recreation and tourism. Interior maintains offices in every state where our professionals engage in land management, technical assistance, scientific research, law enforcement and environmental and cultural education. Interior supports the recovery of the Gulf Coast region through partnerships that support restoration, promote outdoor recreation and tourism, and support states and local communities with a shared mission for ecological and economic sustainability. Learn more about the RESTORE ACT: <http://www.whitehouse.gov/the-press-office/2012/09/10/executive-order-gulf-coast-ecosystem-restoration>

In advance of Isaac's landfall, USGS scientists also predicted that Isaac would overwash the central part of the inhabited Dauphin Island where Katrina had breached it seven years ago. Post-storm aerial photography and lidar surveys are used to verify the forecasts of coastal impacts and help refine predictive models. Learn more about USGS coastal change predictive capabilities: <http://coastal.er.usgs.gov/hurricanes/isaac/coastal-change/> Learn about other USGS science supporting coastal resilience: http://www.usgs.gov/blogs/features/usgs_top_story/isaac/

At right - Aerial images of the Chandeleur Islands, LA before (top) and after (bottom) Hurricane Isaac, demonstrate the severe impacts overwash and inundation can have on beaches. Photo credit: USGS. More images are available on-line. <http://coastal.er.usgs.gov/hurricanes/isaac/photo-comparisons/>



Managing Offshore Sand Resources

BOEM's Role in Restoring Our Nation's Coastlines

By Seth Sykora-Bodie

The Bureau of Ocean Energy Management (BOEM) is most well-known for its role in leasing offshore oil and gas reserves, “protecting the environment while ensuring the safe development of the nation’s offshore energy and marine mineral resources.” What few know is that these mineral resources include sand, gravel and shell resources on the Outer Continental Shelf (OCS). These sediments are the basic building blocks of our Nation’s beaches. While states own the rights to offshore mineral resources within three nautical miles off the coast (with two exceptions, Texas and Florida’s Gulf of Mexico coastline), BOEM manages these resources further offshore, in the OCS, through the Marine Minerals Program (MMP). Coastal states usually rely on these offshore deposits as their source for material used in beach renourishment programs. However, as states deplete the sand resources



Active beach restoration taking place at NASA's Wallops Island facility. Photo credit: Charlie Broadwater, BOEM

closer to shore they must go farther offshore to gain access to sand resources that occur in the OCS. These materials are used to renourish beaches, protect and restore shorelines and wetlands where they mitigate hurricane impacts, erosion, sea-level rise and wetland habitat loss as well as protecting critical inland infrastructure.

Access to these deposits is managed through BOEM’s MMP to ensure that these proposed projects are economically beneficial to the

nation as a whole, and that they protect the integrity of the local ecosystem. In evaluating these projects, BOEM seeks to minimize detrimental environmental effects while maximizing habitat protection. Since 1994, over \$12 million has been spent on MMP Environmental Studies that inform the decision-making process.

The MMP has worked collaboratively with other federal agencies such as the National Park Service, National Aeronautics and Space Administration, National Oceanic and Atmospheric Administration, United States Geological Survey, United States Army Corps of Engineers, United States Navy and the United States Air Force to study, analyze, develop and construct various conservation activities related to the strategic placement of dredged material from the OCS. The MMP also has active partnerships with coastal States, such as Louisiana, Florida and Virginia as well as their environmental agencies. Since the program is strictly



A hopper dredge used during a project at NASA's Wallops Island facility. Photo credit: Charlie Broadwater, BOEM

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and empties into the Pacific Ocean through the Strait of Juan de Fuca near Port Angeles, Washington. Its sand and gravel beds and swift currents historically combined to make the Elwha River an unusually diverse and productive fishery, with 10 runs of anadromous (freshwater-to-sea migration) fish, including all five species of native Pacific salmon and steelhead, until two hydroelectric projects dammed its flow in 1913 and 1927. The Elwha and Glines Canyon dams collected not just water but the large amounts of sediment (19 million cubic meters) that would normally have been carried downstream, providing habitat for many species and counteracting coastal erosion. The dams thus changed the watershed's physical and biological character and with it the kind of species that could thrive there. By 2011, the Elwha's fish population had dwindled to less than 5 percent of its historical levels; the now-outmoded power plants had long been closed. In 1992, the U.S. Congress authorized the decommissioning of the Elwha and Glines Canyon dams, which would become the largest river restoration ever attempted in the United States. The USGS and many partners were called in to study the entire process, beginning with establishing baseline conditions for hydrology, geomorphology, biology and ecology.

"We have had the opportunity to gather a lot of data and information as the Elwha story unfolds. Our job is to provide a technically accurate scientific narrative of the ecosystem response, which will provide a baseline to help us understand the changes that occur over the short- and long-term," explained USGS



Interior scientists and resource managers participated in a Elwha River public science forum along with representatives from the Lower Elwha Klallam Tribe and NOAA. During the forum they presented their findings, future directions for study and also answered questions from the audience. Participants from left, Jeff Duda (USGS), George Pess (NOAA), Mike McHenry (Lower Elwha Klallam tribe), Guy Gelfenbaum (USGS), Tim Randle (Bureau of Reclamation), and Josh Chenoweth (Olympic National Park). Photo credit: Keith Thorpe, Peninsula Daily News.

research ecologist Jeff Duda. The scientists collected detailed beach topography and nearshore bathymetry around the Elwha River mouth in May and August 2012 to document the initial delivery of sediment down the river to the Strait. Roughly 90,000 cubic meters of sand has accumulated offshore and directly east of the river mouth in areas that USGS models predicted.

The changes have begun to change the ecology of the river and its estuary in ways USGS and partners will continue to observe. As river water and sediment mix into the coastal waters of the Strait of Juan de Fuca, a large, turbid river plume was created. Decreases in annual seaweeds were documented by ongoing USGS-led SCUBA dive studies (*see related story, page 13*), but nearshore invertebrates and fish were still abundant during the first season of post-dam removal monitoring.

In what Duda calls a pleasant development, Chinook, coho, and pink salmon, as well as native steelhead, have begun to swim

through the turbid waters to search for mates in waters that have been blocked by the dams for 100 years. Recolonization of coho and steelhead from this past winter has resulted in the first juvenile salmon to emerge from the gravels above the Elwha Dam site.

Changes in the Elwha River estuary is renewing important habitat for juvenile salmon. The news of their first natural passage in nearly 100 years is just a first step in restoring the Elwha's uniquely productive fisheries.

It is also highly symbolic to the Lower Elwha Klallam people. In fact, tribal tradition holds that life itself began for the tribe from within the Elwha River, at a site behind the Elwha Dam that was submerged by the reservoir. It has been restored to view only this year. "There's a bowl in the rock. That's where the Creator created the Elwha people," said Lower Elwha Klallam chair Frances Charles. http://www.usgs.gov/blogs/features/usgs_top_story/elwha-one-year-later/?from=title

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maps, and mariner notices, depending on the need.

Integrating and synthesizing real-time and static data into a single interactive map, ERMA provides a quick visualization of the situation, improving communication and coordination among responders and stakeholders. NOAA developed Arctic ERMA to be better prepared for escalating energy exploration and transportation activity in the region.

“After observing the positive way in which the ERMA assisted response efforts in the Gulf of Mexico, I believe it is highly important to support the continued development of an Arctic ERMA. It will be useful to communities, public agencies and the private sector as a tool to guide many activities,” said Fran Ulmer, chair, U.S. Arctic Research Commission. The Alaska Ocean Observing System, the University of Alaska Fairbanks, and the University of New Hampshire, as well as Alaska’s Arctic boroughs, are working with NOAA’s Office of Response and Restoration to keep this database current. Data includes the traditional and local knowledge of cultural and subsistence resources. They also include observations of the extent and concentration of sea ice, locations of ports and pipelines, and vulnerable environmental resources. Information in Arctic ERMA is pulled from many innovative and current sources, including data provided through a recent Memorandum of Agreement with Shell, Conoco-Phillips and Statoil USA that calls for the sharing of physical and biological data in the Arctic, as well as information gained during the August 2012 hydrographic survey cruise

by the NOAA Ship Fairweather.

In addition to local and natural resource information, BSEE has contributed improved access to key environmental, commercial, and industrial data sources throughout lease areas in the Arctic. BSEE and other organizations will optimize real-time sensors to feed the data directly into ERMA during both potential oil releases and hazmat spill drills.

ERMA is frequently used as a planning and management tool in spill drills and trainings. Most recently, Arctic ERMA was used by NOAA, BSEE, and the U.S. Coast Guard during a Chukchi Sea oil spill drill.

Arctic ERMA is a product of a partnership among NOAA, BSEE, Oil Spill Recovery Institute and the University of New Hampshire. ERMA is currently available for eight geographic regions—Gulf of Mexico, New England, Atlantic, Caribbean, Southwest, Pacific Islands, Pacific Northwest, and Arctic.

The Interagency Working Group on Coordination of Domestic Energy Development and Permitting in Alaska, was established by President Obama in July 2011. Chaired by Department of the Interior Deputy Secretary David J. Hayes, the working group coordinates the efforts of federal agencies responsible for overseeing the safe and responsible development of onshore and offshore energy in Alaska. <http://www.doi.gov/alaskaenergy>.

View Gulf of Mexico ERMA: <http://gomex.erma.noaa.gov/erma.html>.

Arctic ERMA: <https://www.erma.unh.edu/arctic>

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limited to managing offshore resources and projects, the physical work, such as the removal of sand or gravel resources, is done by others, chiefly the U.S. Army Corps of Engineers. These relationships have grown stronger with time as the MMP has created a number of working groups. Currently, there are three working group regions: Mid-Atlantic, Gulf of Mexico, and Florida. The MMP holds annual meetings of public, private, and academic stakeholders who are involved in evaluating and designing these projects.

Over the last twenty years the MMP has been involved in projects that have moved over 69 million cubic yards of sand (or roughly 50 Empire State Buildings) in Florida, Louisiana, Maryland, South Carolina, and Virginia. In the next few years, the MMP expects there will be an additional 3 or 4 states that have never received OCS sand to begin the process for access to federal resources for beach nourishment, shore protection, or wetlands restoration projects. To date, the completed MMP projects have restored approximately 180 miles of coastline to the advantage of many species that rely on beaches for nesting or as critical coastal habitat as well as our nation’s coastal communities and vital inland infrastructure. The MMP is another way the Interior works with stakeholders to protect and restore beaches across the nation.

Learn more: <http://www.boem.gov/MarineMineralsProgram>



Lighthouses Mark Historical Shoreline Changes on Cape Hatteras National Seashore

<http://www.nps.gov/caha/historyculture/cape-hatteras-light-station.htm>
<http://www.nps.gov/caha/historyculture/lightstations.htm>



Cape Hatteras National Seashore is our nation's first national seashore established on January 12, 1953. Three light stations still serve as active aids-to-navigation along the Cape Hatteras National Seashore beaming out across the treacherous waters known to sea captains as the "Graveyard of the Atlantic." The lighthouses stand constant as the sandy deposits of the barrier island system continue to shift over time.

The Ocracoke Light is the second oldest operating lighthouse in the nation. Ocracoke Inlet was first placed on the map when English explorers wrecked a sailing ship there in 1585. Two centuries later, this was one of the busiest inlets on the East Coast. Ocracoke Village, was known then as Pilot Town, because pilots, who were hired to steer ships safely through the shifting channels to mainland ports, settled there. Ocracoke Lighthouse construction began in 1794, but in less than 20 years, the main channel had shifted nearly a mile away.

Later, in the 1870s, two tall coastal lights, Bodie Island and Cape Hatteras, were built along the Outer Banks to warn ships of the dangerous shifting shoals offshore of the barrier islands.

The Cape Hatteras Lighthouse is the tallest brick lighthouse in the world. It was built 1,500 feet from shore in 1870, but in 129 years the shoreline had migrated to within 100 feet of it. In 1999, the lighthouse was moved inland to a distance of 1,600 feet from the Atlantic Ocean.



Ocracoke Lighthouse



Bodie Island Lighthouse



Cape Hatteras Lighthouse

The Hatteras lighthouse was moved a total of 2,900 feet along a carefully-prepared 'move corridor'. Below, a view from the top of the lighthouse shows the path it traveled from the shore to its present location.

