



# NEWSWAVE

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

Spring 2012

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## Exploring Interior's Deepest Monument



USFWS Monument Superintendent Susan White and explorer James Cameron pose beside the *DEEPSEA CHALLENGER*, the single-pilot submersible vehicle.

Interior hosted a world-class exploration team as they conducted an historic dive on March 25, to Challenger Deep in the Marianas Trench, the deepest place known on Earth. The Marianas Trench Marine National Monument (MT-MNM) is jointly managed by the U.S. Fish and Wildlife Service as part of its National Wildlife Refuge System and the National Oceanic and Atmospheric Administration's Marine Fisheries Service. Refuge Chief Jim Kurth said, "The Marianas Trench Marine National Monument protects one of the most unique ocean environments in the world. It is a place we know precious little about. Like the other marine national monuments man-

## A Look at Interior's Ocean Role and the National Ocean Policy

By Ann Tihansky and Randy Bowman

Interior has a critical Federal role in ensuring that our Nation efficiently and effectively conserves and manages our ocean, coastal and Great Lakes resources. Top Interior leadership as well as Bureau staff continue working to ensure that planned implementation measures for the nine Priority Objectives of the National Ocean Policy align with existing Interior programs and the Department's

See *Ocean Role* page 7



**"One Nation,  
Shaped By the  
Sea"**

June 4-8, 2012

Interior is one of this year's participants chosen to examine the ocean's role in shaping our nation. "One Nation, Shaped by the Sea," will provide policymakers, business leaders, academics, and concerned citizens with insights into America's interaction with the sea and will help chart an economically and environmentally sustainable course for our nation's future.

### FREE REGISTRATION

<http://www.webworksmid.com/nmsf2012/index-chow.php?action=register>

**Calendar of Events:** <http://www.nmsfocean.org/CHOW-2012-calendar>

See *Deep Dive* page 8



**Are you interested in contributing to NewsWave?**

Submission Guidelines: <http://www.doi.gov/pmb/ocean/news/NewsWave/index.cfm>

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**The National Ocean Science Bowl® Needs YOU!**

The National Ocean Science Bowl (NOSB) needs ocean science questions for the 2013 competitions. This national academic competition on marine sciences for high school students ([www.nosb.org](http://www.nosb.org)) has been inspiring students to pursue careers in Science, Technology, Engineering and Math (STEM) applied fields for 16 years. You could get paid for contributing questions. Visit: <http://www.oceanleadership.org/2012/announcement-for-2012-2013-nosb-question-writing-and-development-committee-participants/>



Close-up image of the cold-water coral *Lophelia pertusa*, with polyps extended. The coral polyps eat by grabbing tiny suspended particulates (visible against the dark water background). Photo credits: USGS

**BSEE, NOAA to Develop Arctic Version of ERMA**

The Bureau of Safety and Environmental Enforcement (BSEE) and NOAA are partnering to develop a version of the Environmental Response Management Application (ERMA) for the Arctic by this summer. ERMA will help address numerous challenges in the region where more ship traffic and proposed energy development are increasing the risk of oil spills and chemical releases. ERMA is the same interactive online mapping tool used by Federal responders during the Deepwater Horizon. The U.S. Arctic Research Commission came out in support of ERMA's further development. Fran Ulmer, chair of the U.S. Arctic Research Commission, said, "An Arctic version of ERMA will greatly aid U.S. response capacity in the event of an oil spill or chemical release and I strongly support it. Now is the time to create useful tools like this." <http://www.bsee.gov/BSEE-Newsroom/Press-Releases/2012/press02072012.aspx>



Close-up of a squat lobster, *Eumunida picta*, in a thicket of *Lophelia pertusa* coral.



## Japanese Tsunami Debris Reaches US Shores

By Bret Wolfe and Ann Tihansky

A Japanese soccer ball and volleyball recently discovered on a beach in Alaska are some of the first items that clearly document tsunami debris from Japan is reaching American shores. The tsunami that followed the March 2011 Tohoku earthquake in Japan inundated and swept across large coastal areas introducing a wide array of material into the ocean.

While much of the material likely sank, large areas of debris were initially observed floating in coastal areas off Japan's shores. The appearance of the debris in the Gulf of Alaska within a little over a year's time demonstrates how the oceans connect our shores across the globe.



Japanese writing on soccer ball recovered on Middleton Island in the Gulf of Alaska. Photo credit: David Baxter, NOAA

Wind and ocean currents continue to disperse and transport this material. The islands of Midway Atoll and Hawaiian Islands National Wildlife Refuges, are impacted daily by the large amount of marine debris already present in this area of the Pacific Ocean. While much of the debris cannot be accurately attributed to having tsunami origins, ocean circulation mod-



Tsunami debris making its way across the Pacific Ocean could have impacts on coastal wildlife such as these green sea turtles seen loafing at French Frigate Shoals in the Hawaiian Islands National Wildlife Refuge, part of the Papahānaumokuākea Marine National Monument. Photo: USFWS

els developed by NOAA and the University of Hawaii are predicting that tsunami debris will continue to reach the Pacific shores of North America during the next few years. The Hawaiian Islands may see debris come ashore at any time.

Sensitive shorelines, seabird habitats and delicate coral reefs in the Papahānaumokuākea Marine National Monument are currently within the predicted path. Federal government agencies, including NOAA, EPA, and the U.S. Fish and Wildlife Service, are coordinating with Pacific coastal states, the Government of Japan and other partners to reduce possible impacts to natural resources, coastal communities and marine transportation. Partner agencies are requesting public support to:

- help gather at-sea observations of debris concentrations and
- inform discussions of how the tsunami marine debris may affect our marine transportation systems.

### Report sightings of potential Japan tsunami marine debris by sending information and photos to:

[disasterdebris@noaa.gov](mailto:disasterdebris@noaa.gov)

### NOAA Japan Tsunami Debris FAQ's

<http://marinedebris.noaa.gov/info/japanfaqs.html>

### EPA Region 9 Marine Debris

<http://www.epa.gov/region9/marine-debris/>

Individuals or groups can help monitor shorelines. Request a copy of the NOAA's Marine Debris Program's Shoreline Survey Field Guide and electronic data sheet at: [MD.monitoring@noaa.gov](mailto:MD.monitoring@noaa.gov).

Marine Debris Joint Information Center webpage: <http://disasterdebris.wordpress.com/>

International Pacific Research Center – Tsunami Debris Models: [http://iprc.soest.hawaii.edu/news/marine\\_and\\_tsunami\\_debris\\_news.php](http://iprc.soest.hawaii.edu/news/marine_and_tsunami_debris_news.php)

## World Oceans Day 2012

Creating a Vision through Live Interactive Video, Art, Photography, and Films

Celebrate World Oceans Day by taking a virtual dive into a kelp forest with National Park Service diving park rangers. From June 6-9, 'Live Dive' broadcasts will be transmitted from underwater at Channel Islands National Park to participating west coast institutions from Alaska to southern California. You can also view the programs at the Park's visitor Center in Ventura, California or online at: <http://www.nps.gov/chis/planyourvisit/live-programs.htm>

This unique program is provided by an educational partnership between the NPS and the Ventura County Office of Education.

On June 8, in Washington, DC, the Coastal America Partnership, the Smithsonian's National Museum of Natural History (NMNH), the National Geographic Society and the National Marine Sanctuary Foundation offer other exciting activities:

- Special showings of new, short films about marine protected areas,
- Ocean experts will interact with visitors in the NMNH Sant Ocean Hall,
- Cartoonist Jim Toomey will present, "Drawing Inspiration from the Sea" join him in creating four giant ocean ecosystem murals,
- Celebrate this year's winners of Coastal America's Student Ocean Art Contest-- themed, "Youth, the Next Wave of Change."

Sylvia Earle, renowned oceanographer and National Geographic Explorer-in-Residence will also join in this visionary effort.

[www.coastalamerica.gov](http://www.coastalamerica.gov)



The Channel Islands National Park reaches audiences beyond the Park through the 'Live Dive' program where SCUBA Rangers give live interactive tours through kelp forests and other offshore environments. The Channel Islands National Park will host their Live Dive series during the week June 6-9, 2012 to celebrate World Oceans Day. Photo credit: Tim Hauf/timhaufphotography.com

### DIVE IN!

<http://www.nps.gov/chis/parknews/world-oceans-day-2012.htm>



First Place winning artwork in the 3-5 grade age group from Coastal America's Student Ocean Art Contest in 2008. Malinalli Ramírez Martínez, from Acuario de Veracruz, Mexico, illustrated the theme, "The Ocean and Humans are Inextricably Interconnected".



## First Lady of Oregon Learns About Chesapeake Bay Restoration Efforts

By Ann Tihansky

Oregon's First Lady, Cylvia Hayes, has identified healthy oceans as one of her top priorities, so during a trip to Washington, DC, Hayes requested a meeting and field trip to learn more about Chesapeake Bay, the National Ocean Policy and related activities that address ocean and coastal issues. The National Ocean Council (NOC) arranged the meeting on February 24, with the Chair of the White House Council of Environmental Quality, Nancy Sutley, and Federal partners from Interior, National Oceanic and Atmospheric Administration, Environmental Protection Agency, US Army Corps of Engineers (USACE), and U.S. Department of Agriculture's Natural Resources Conservation Service. Hayes learned how interagency projects address common resource management goals. The NOC's Acting Director, Michael Weiss, and Interior's Deputy Assistant Secretary Eileen



The meeting prompted side conversations about interagency collaboration and common goals for the Chesapeake Bay ecosystem. From left to right: Cylvia Hayes-First Lady of Oregon, Nancy Sutley-Chair of the White House Council of Environmental Quality, Eileen Sobeck-Interior's Deputy Assistant Secretary for Fish and Wildlife and Parks, Ann Mills-Deputy Under Secretary, Department of Agriculture. Photo credit: Ann Tihansky.

Sobeck joined other Federal representatives who briefly described programs demonstrating where agencies are working together to address Chesapeake Bay's environmental challenges such as water quality, declining fisheries, shoreline erosion and long-term resource planning. The USACE discussed partnerships at a large restoration project at Poplar Island, where dredged material is being used to create expansive coastal wetland

habitats (*see related story page 12*). The group also visited one of the Bay Buoys, a joint data-collection project between NOAA and Interior's National Park Service and examined some oyster bars that had been part of a reseeding program.

Read more: <http://www.hometownannapolis.com/news/top/2012/02/25-02/Bay-gets-look-from-White-House-official.html>.



Mike Slattery, USFWS Chesapeake Bay Coordinator, discussed the synergistic benefits of having Federal agencies co-located in the office facility referred to as the 'Fish Shack' in Annapolis. Photo credit: Ann Tihansky



Preparing for a boat tour of natural resources along the Annapolis waterfront, from left to right: Jessica Hamilton Keys-Senior Policy Advisor-NOAA, Cylvia Hayes-First Lady of Oregon, Michael Weiss-National Ocean Council, Peyton Robertson-Director of NOAA's Chesapeake Bay Office, Eric Schwaab-NOAA's Assistant Secretary of Commerce for Conservation and Management, Eileen Sobeck-Interior's Deputy Assistant Secretary for Fish and Wildlife and Parks, David Bruce-Ecologist-NOAA. Photo credit: Kimberley Couranz, NOAA

## USGS Satellite Tracking Reveals Sea Turtle Feeding Hotspots

By Rachel Pawlitz

Satellite tracking of threatened loggerhead sea turtles has revealed two previously unknown feeding 'hotspots' in the Gulf of Mexico that are providing important habitat for at least three separate populations of the turtles, according to a study published recently in the journal *Biological Conservation*. By identifying the specific location of regularly used habitat, the results provide invaluable information for marine planning and management for this species. The maritime feeding grounds also hold the first clues about how loggerhead sea turtles spend time at sea. Populations in the Gulf of Mexico are well below historic levels and in recent years have continued to decline drastically in some areas. "Up until now, management actions that affect loggerheads have often focused on their limited time at nesting beaches, or on fisheries regulations," said Kristen Hart, Ph.D., the U.S. Geological Survey research ecologist who led the synthesis. "The use of satellite tags for tracking marine animals has opened our eyes to the secret lives of some of nature's most elusive creatures," said USGS Director Marcia McNutt, "At first a scientific tool to understand the life cycle of animals, such as white sharks and leatherback turtles, who rarely come into contact with humans, these tags may now be the main hope for understanding what we can do, or what we should stop doing, in order to bring them back from the road to extinction."

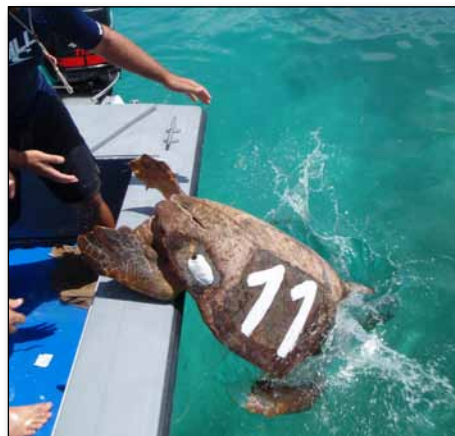
<http://www.usgs.gov/newsroom/article.asp?ID=3092&from=rss>

## Babb-Brott Named by White House as New Director for the National Ocean Council



National Ocean Council Director Deerin Babb-Brott. Photo credit: Ann Tihansky

The National Ocean Council (NOC) announced Mr. Deerin Babb-Brott as the Director of the National Ocean Council Office. Deerin brings a tremendous level of skill, expertise, and knowledge to the Council as former Assistant Secretary for Ocean and Coastal Zone Management in Massachusetts where he led the development of the Massachusetts ocean management plan. He has 22 years of experience in the environmental field, with a focus on coastal management issues and environmental impact review. Previously, he served as Assistant Secretary for Environmental Impact Review and Director of the Massachusetts Environmental Policy Act Office, managing the environmental review of major development projects in the Commonwealth. Deerin has also served in the Coastal States Organization and on the Department of Interior's Outer Continental Shelf Policy Committee, contributing to national policy discussions on the Coastal Zone Management Act, energy facility siting, and alternative uses of Outer Continental Shelf resources. As Director of the NOC Office, Deerin will support the Council Co-chairs in implementing the National Ocean Policy, be responsible for ensuring the effective operation of the NOC, and represent NOC within the community. On March 8, the new leader shared his thoughts on the National Ocean Council Blog. <http://www.whitehouse.gov/blog/2012/03/08/new-leader-protecting-our-oceans-and-coasts>



*"Our findings open up important new options for marine habitat conservation, and provide valuable geographic data that can be used to strategically locate marine reserves based on the best available science, as called for in the new National Ocean Policy,"*

Kristen Hart, USGS Research Ecologist

Scientists release Loggerhead Turtle 11, after outfitting it with a satellite tag that allows them to track its movement over time. In this study, a new method was used to calculate when it was feeding based on its movement patterns.



mission. Most recently, Deputy Secretary David Hayes represented the Secretary at a March 1 meeting of the principal members of National Ocean Council (NOC), while Laura Davis, Chief of Staff, represented Interior at the NOC Deputies meeting March 29. Both meetings focused on the progress and future directions of the NOC as well as the actions and priorities identified in the final Implementation Plan. <http://www.whitehouse.gov/administration/eop/oceans/implementationplan>

Interior has key responsibilities in all areas of the Ocean Policy Implementation Plan. For example, Interior has a major role in the Arctic, where we manage large-scale ecosystems and species at risk, on-shore and off-shore energy resources, and have a large-scale scientific presence. This is reflected in the *Arctic* chapter of the Implementation Plan, which focuses on better interagency planning for oil spills from increased ship traffic or energy development, shoreline mapping and charting, creation of a distributed biological observation system, and pursuing international cooperation through the Arctic Council and other forums, all efforts in which DOI plays a key role.

DOI also is a leading Federal partner nationally in ecosystem restoration, leading the South Florida Ecosystem Restoration Task Force and making major contributions to efforts in the Chesapeake Bay, Great Lakes, Gulf of Mexico, San Francisco Bay/Delta and Puget Sound, among others. The *Regional Ecosystem Restoration* section of the Implementation Plan has specific elements calling for final-

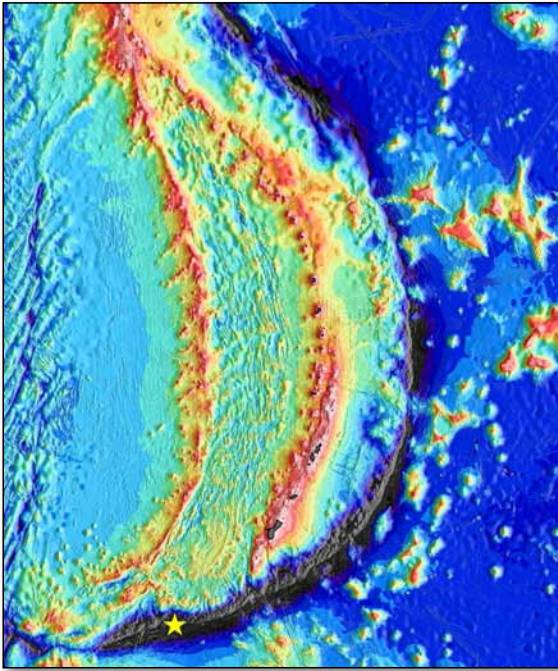


ization and national distribution of a decision support tool to identify land protection and restoration priorities, now under development for the Chesapeake Bay restoration effort by NPS and USGS. Other significant DOI roles in this section of the Plan include actions related to coastal wetlands loss, based on the FWS Wetlands Status and Trends reports; to incorporate carbon sequestration into habitat conservation programs, based on pioneering work by USGS; and in partnership efforts to further address invasive species and protect coral reefs through interagency Task Forces where DOI plays a leadership role.

Science is emphasized throughout the Implementation Plan. The *Informing Decisions* area includes interagency efforts to provide scientific information to support emerging uses of ocean and coastal

resources in the areas of renewable energy, aquaculture, biotechnology and fisheries. BOEM, FWS and USGS all play major roles in these areas, while USGS is a key player in many of the actions called for under the *Observations and Mapping* section. Sharing of data between agencies and making it readily available to the public is priority throughout the Plan, and DOI has been a major contributor to both the design of and availability of data for the new Federal comprehensive data sharing portal: <http://www.data.gov/ocean>, which is now operational. Making practical use of scientific knowledge is a key element of the *Resiliency and Adaptation to Climate Change* section, where moving the U.S. toward greater resiliency in the face of natural hazards and changing conditions is a priority and USGS





Bathymetric map of the Mariana island-arc system in the western Pacific. The star marks Challenger Deep, the deepest part of the seafloor. Image credit: Daniel Schierer, USGS



The DEEPSEA CHALLENGER is a custom-built, 24-foot-long (7.3-meters) submersible co-designed by deep-sea explorer, James Cameron. Read more about it at USFWS Superintendent White's "inside the Expedition" Blog: <http://deepseachallenge.com/inside-the-expedition/the-mariana-trench-monument/>

*Deep Dive continued from page 1*

aged primarily by the U.S. Fish and Wildlife Service in coordination with our partners, the Mariana Trench is little explored. But we do know one fact, irrefutably: these natural resources are unique and irreplaceable. I can't think of a more important message that Mr. Cameron's exploration will send to his legions of young fans. After all, it's their legacy that he is giving us a lens into. We are committed to be good stewards of this incredible place." The historic dive expedition, known as DEEPSEA CHALLENGE is a partnership between James Cameron, the National Geographic Society and Rolex. Cameron, Academy Award-winning director and National Geographic explorer-in-residence, successfully completed his nearly seven-mile dive in a submersible to Challenger Deep and broke the solo dive record. The expedition is also a scientific breakthrough toward understanding the exceptional geologic features and undescribed or yet-to-be-discovered life forms in the most extreme environment on Earth.

Cameron's expedition team worked with the U.S. Fish and Wildlife Service in planning dives that comply with the monument's conservation mandate. Expedition members assisted the Service during the manager's review of the applications for scientific exploration and filming in the monument by provid-

ing scientific publications on human effects on the deep sea and advising on practices to minimize potential effects of future exploration of the monument. Two Special Use Permits were issued authorizing the expedition to work in the monument. In addition to the unique scientific opportunities, this expedition promotes the need to protect and preserve individual ecosystems of the planet, including deep sea locations. DEEPSEA CHALLENGE expedition's chief scientist, Dr. Douglas Barrett of the Scripps Institute of Oceanography said, "The Marianas Trench Marine National Monument is the only protected trench on Earth, and although less visible to Americans than Yellowstone or Yosemite, it should be no less cherished."

The Marianas Trench Marine National Monument (MTMNM) is approximately 95,216 square miles (roughly the size of Oregon) and consists of submerged lands and some of the waters of the Mariana Archipelago within three designated units. The Challenger Deep is adjacent to the MTMNM. Other submersible dives are planned for Sirena Deep within the Monument. See "Surfing Bison" feature October 2010 (<http://www.doi.gov/pmb/ocean/news/NewsWave/index.cfm>).

Learn more:

<http://www.fws.gov/marianastrenchmarinemonument/> and [www.deepseachallenge.com](http://www.deepseachallenge.com)





U.S. Coral Reef Task Force co-chairs; Interior's Eileen Sobeck and NOAA's Andrew Winer welcome attendees to the annual meeting in Washington DC in Interior's Udall Auditorium. Pictured left to right: Governor Fitial (Commonwealth of the Northern Mariana Islands-CNMI), Liza Johnson (DOI), Eileen Sobeck, Andrew Winer, Beth Dieveney (NOAA), Lelei Peau (American Samoa), Gov. Tulafono (American Samoa). Photo credit: Ann Tihansky

## Improving Watersheds for Coral Reef Health

### *US Coral Reef Task Force Meeting Focus on Partnership Initiatives*

By Liza Johnson

The US Coral Reef Task Force (USCRTF) held the annual Washington, D.C., meeting the week of February 21 with a public meeting on February 23, 2012.

Field staff presented status reports and accomplishments from the two existing Watershed Partnership Initiatives sites in the Guanica/Rio Loco Watershed, Puerto Rico and the West Maui/Ka'anapali Watershed, Hawaii. The Initiative also moved forward with selecting Faga'alu in American Samoa, as the second Pacific priority watershed to be addressed through a place-based partnership. Multiple Federal agencies will bring resources to collaborate with local government agencies and non-government organizations.

The Task Force will also host two students in Summer 2012 as part of the Governor Sunia Memorial Internship to work with farmers

and ranchers in these watersheds to develop conservation plans and conservation practices that address natural resource problems.

USCRTF Co-Chair and Fish and Wildlife and Parks Deputy Assistant Secretary, Eileen Sobeck, and three Governor Members provided remarks. Michael Weiss, of the National Ocean Council, presented information about how the Task Force is engaged with the National Ocean Policy, the Implementation Plan and Regional Planning Bodies.

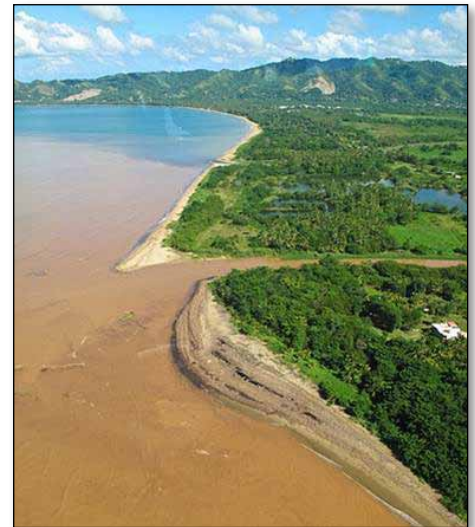
The Coral Reef Injury and Mitigation Working Group held a workshop to develop an outline for a reef managers resource handbook. This handbook is being designed to provide guidance on coral reef impact focused on avoiding, minimizing, mitigating, and restoring from impacts of both planned (permitted and authorized) and unplanned (vessel grounding) events.

The Task Force also developed a workplan for more targeted and streamlined work in the coming year.

The next meeting will be held August 17-23. It will focus on: Disaster Relief, Community Resilience, Climate Change, and Watershed Management. DOI is the Federal co-host for this meeting. This will be the last meeting with Governor Togiola Tulafono as a sitting governor. The Governor has been a true leader and has attended every meeting since becoming Governor.

Learn more:

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



The Watershed Partnership Initiative (WPI) helps communities reduce land-use practices that impact coral reef health in offshore areas, such as sediment-laden runoff that creates sediment plumes as shown above. Below, Guanica Bay, Puerto Rico- an existing WPI site. Photo credits: Tom Moore, NOAA.



## Sea-level Rise Scenarios and Coastal Change Science Informs Local and Global Communities

*USGS Scientists Participate on the Fifth Intergovernmental Panel on Climate Change and US Global Change Research Program's National Climate Assessment*

USGS climate and coastal experts are engaging with other scientists through a number of global exchanges and as authors participating in the Fifth Assessment of the Intergovernmental Panel on Climate Change (IPCC). The distinguished scientists; Virginia Burkett, Abby Sallenger, and Margaret Hiza Redsteer, were nominated by the U.S. government and were selected from 3000 scientists from 85 different countries. Their three chapters will appear in the Working Group II contribution to the IPCC Fifth Assessment Report entitled "Climate Change 2013: Impacts, Adaptation, and Vulnerability" that will be published jointly by the IPCC and the World Meteorological Organization.

Burkett is a Coordinating Lead Author of Chapter 1, Point of Departure. Sallenger is a Lead Author of Chapter 5, Coastal Systems and Low-Lying Areas. Redsteer is a Lead Author, Chapter 15, Adaptation Planning and Implementation. In addition, USGS experts are contributing to the 'Coastal Technical Report' and the 'Sea Level Rise Scenarios Report' for the National Climate Assessment (NCA). <http://www.globalchange.gov/what-we-do/assessment>

The Coastal Technical Input Report, an assessment co-led by NOAA and USGS, includes USGS



Authors of the IPCC Fifth Assessment - Chapter 1, "Point of Departure": (left to right) standing: Michael Prather (US), Rupa Mukerji (Switzerland), Asuncion Lera St. Clair (Norway), Marco Bindi (Italy), Kris Ebi (Executive Director IPCC WG2 Technical Support Unit), Cecilia Conde (Mexico); seated: Emma Nyambod (Cameroon, Volunteer Chapter Scientist), and Virginia Burkett (US-USGS). Not pictured: Avelino Suarez (Cuba), William Hare (Germany), Gary Yohe (US). Photo credit: Cecelia Conde.

team members: Virginia Burkett – co-leader of the coastal assessment; Jeff Williams, (USGS Emeritus) leader of the chapter on physical coastal processes; and co-authors Rob Theiler, Tom Huntington, Tom Doyle, Hilary Stockdon, Glenn Guntenspergen, Neil Ganju, and Don Cahoon.

Burkett and Sallenger are also members of the NCA Sea Level Rise Scenarios Team (SLRST), a science panel composed of members appointed by the National Climate Assessment Development Advisory Committee (NCADAC). This Federal advisory committee is tasked with developing sea level rise scenarios for the 2013 NCA. USGS hosted a SLRST Team workshop in Reston in August 2011 and produced a 'sea level rise scenario report' that is currently in review. The SLRST Team will also share findings in a journal article. Scientists are sharing this information at more local levels as well. Burkett presented "Update on the

State of Sea-Level Rise Science" with global, national and regional sea-level rise updates focusing on the Gulf of Mexico at the Gulf of Mexico Climate Community of Practice's third annual meeting on April 11th via webinar.

Learn more: <http://www.ipcc.ch/activities/activities.shtml>.

### Sea-Level Science at Florida Summit

USGS Scientist Abby Sallenger will be participating in the conference, "RISK AND RESPONSE: Sea Level Rise Summit", June 21 – 22, 2012 in Boca Raton, FL. He will join other researchers in a session called, Sea Level Rise and Florida: A Complex and Unique Relationship." The session will review current and future sea level rise science as well as issues that make Florida vulnerable.

[www.ces.fau.edu/SLR2012](http://www.ces.fau.edu/SLR2012)



## Benefits of Watershed Improvements Spill Over into Estuary and Coastal Refuge

U.S. Fish and Wildlife Service Biologist Recognized with “Conservationist of the Year” Award

By Ann Tihansky and Willard Smith

The Tecumseh Weir Project was designed to address impacts of fine suspended sediments that were entering the Back Bay estuary primarily from Lake Tecumseh and reducing the growth of submerged aquatic vegetation, fouling fish gills, and degrading waterfowl habitat.

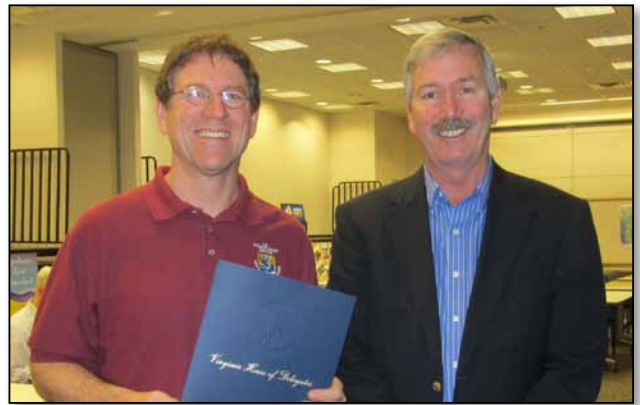
Data shows that the weirs prevent an estimated 2,000 tons of sediment from entering Back Bay estuary annually, much of which can remain suspended in the water column for several weeks. “Water quality has improved; grasses are growing again, which attracts more fish and waterfowl. We’ve been huge fans of the project,” said Kathy Owens, acting Director of the Back Bay National Wildlife Refuge, quoted in the *Virginian-Pilot*. The Virginia Department of Game and Inland Fisheries has already recorded an increase in fish biodiversity in Lake Tecumseh since the weir was constructed further demonstrating benefits of improved aquatic habitats for fish and wildlife.

Virginia’s Back Bay Restoration Foundation (BBRF) recognized the improvements and gave USFWS biologist Willard “Will” Smith, the annual “Conservationist of the Year” award in November 2011 for his work on the Lake Tecumseh Weir Project. Virginia’s General Assembly also presented Smith



Lake Tecumseh serves as an important source of freshwater to the Back Bay estuary, where over 9,250 acres provide important wildlife habitat. Inset: The new Lake Tecumseh weir structure prevents sediments from draining into the Back Bay National Wildlife Refuge and estuary.

The Honorable Barry Knight, Virginia Delegate-81st District, (right) presented Will Smith with a commendation from the State of Virginia for restoration work that earned him the Back Bay Restoration Foundation’s 2011 Conservationist of the Year Award. Photo credit: Mark Pavelka, USFWS



with a commendation for his efforts during BBRF’s Back Bay Forum in March 2012.

“BBRF feels that the weir on Lake Tecumseh, and Will Smith’s role in the weir’s construction, has directly improved the water quality in Back Bay, said Todd Barnes, BBRF’s Board President.”

Through Smith’s FWS project, two low water control structures, known as weirs, were installed in a manmade canal to reduce the release of suspended sediment from Lake Tecumseh. The restoration project was supported by the Back Bay Restoration Foundation, The Honorable Barry Knight (Virginia Delegate-81st District), Hampton

Roads Sanitation District, City of Virginia Beach, Naval Air Station Oceana, Friends of Back Bay National Wildlife Refuge, and the Virginia Department of Game and Inland Fisheries. Construction costs were approximately \$330,000 not including staff time.

Read more:

[http://www.bbrf.org/images/December\\_2011\\_color.pdf](http://www.bbrf.org/images/December_2011_color.pdf)

<http://www.fws.gov/northeast/virginiafield/partners/tecumseh.html>

Harper’s *Virginian-Pilot* article February 17, 2012. <http://hamp-tonroads.com/2012/02/data-show-va-beachs-lake-tecumseh-project-works#comment-1293799>

## Decoy Art Aids in Poplar Island Restoration

*Working together for healthy coastal environments*

By Chris Guy, Peter McGowan, Robbie Callahan and Ann Tihansky

The last known nesting colony of common terns in Maryland is at the Paul S. Sarbanes Ecological Restoration Project at Poplar Island or PIERP. Climate change, sea level rise and habitat loss have made common and least tern nesting sites a rare occurrence in the Maryland part of the Chesapeake Bay but the USFWS is working to reestablish them.

Through the Poplar Island restoration program, special habitat islands were created in the PIERP for nesting terns where their small eggs and chicks blend into the background. However the nesting terns also find the active construction zones (complete with large trucks, bulldozers and steam rollers) ideal habitat. Unfortunately, by nesting in the construction areas, the birds are directly in harm's way. To solve the problem, FWS biologists Chris Guy and Pete McGowan, and biotechnician Robbie Callahan from the Service's Chesapeake Bay Field Office, are working on a plan that uses 200 decoys and audio recordings of active tern colonies to encourage the birds to nest on the specially-created habitat islands by luring them away from the construction zones. The scientists hope to give the terns a successful nesting season while restoration construction can go on uninterrupted.

The PIERP is located in Talbot County, Maryland and is supported by the U.S. Army Corps of Engineers and the Maryland Port Authority. The project uses material dredged from the Port of Baltimore shipping channels to restore the island and provide habitat areas that existed in the 1800's.

The Port is vital for a healthy economy in the State of Maryland. Dredging the shipping channels ensures that cargo ships can enter and exit the port safely but also provides dredged material that is used to create a variety of shallow water habitats for bay grasses, crabs, and fish, with marsh and upland habitats for colonial nesting birds, shorebirds, waterfowl, small mammals, reptiles and amphibians.



Close-up view of finished least tern decoy deployed in the field. Photo credit: Ann Tihansky



Construction activities are an integral part of Poplar Island restoration work. Decoys of least terns (shown here in foreground) will hopefully provide cues to attract birds to suitable nesting areas and away from construction zones.







Katie Sobeck paints the finer details on a least tern decoy for use in a USFWS Poplar Island nesting project. Photo credit: Eileen Sobeck.



Chris Guy positions the decoys, which are mounted on rebar stakes to anchor them securely in the sand on the habitat islands. Photo credit: Ann Tihansky



## New USGS Video and Animations Explain Vibracoring Method

<http://www.youtube.com/usgs>  
<http://gallery.usgs.gov/videos/534>

A new video from the USGS Coastal and Marine Geology Program titled, “Vibracoring: Reconstructing the Past from Earth Sediments,” describes how cores are collected in shallow water from the deck of a research vessel. Geologists rely on information from deep beneath the Earth’s surface to reconstruct the past. As sediments accumulate over time, they create records geologists use to understand Earth history and to predict future processes and trends. The most common way to get this information is to drill into sediments that have been deposited over time and recover them in the form of a core. The core samples contain an intact record of the past and can be used to assess the geologic history of an area, such as its geomorphology; coastal, marine, and terrestrial processes; and changes in environmental quality.

See this and other videopodcasts:  
<http://coastal.er.usgs.gov/podcast/>



### Where Do You Get 200 Least Tern Decoys?

During a site visit to Paul S. Sarbanes Ecological Restoration Project at Poplar Island (PIERP) in the summer of 2011, Eileen Sobeck, Deputy Assistant Secretary for Fish and Wildlife and Parks and the Department of Interior’s representative on the Chesapeake Bay Task Force, discovered that Chesapeake Bay Field Office staff were making and painting decoys of common and least terns. It was a labor intensive process that involved making the decoys with molds and resin, then handpainting them.

Sobeck volunteered to paint all of the decoys for the 2012 season and recruited her 82 year-old mother Katie, and her 18 year-old daughter Emma, to help. “My mother is something of an artist and has always been handy with crafts,” said Sobeck. “She painted all but a few dozen of the least terns. And those last few were painted by my daughter, Emma. My role has been limited to picking up and dropping off boxes of decoys, spray painting the base coat of white paint and putting on the final coat of clear sealer.” Together they finished about 200 unpainted and partially-painted decoys.

“The decoys are critical to our colonial waterbird relocation program. The volunteer efforts of the Sobeck family have been very helpful,” said USFWS biologist Chris Guy.

The decoys were placed in prime nesting habitat on Poplar Island in April to be ready to help lure birds arriving for nesting season which begins in May. *(See related story page 12)*

<http://www.fws.gov/chesapeakebay/Newsletter/Spring12/Decoys/Decoys.html>

## Raising Awareness about Impacts from Marine and Aquatic Invasive Species

By Lori Williams and Ann Tihansky



As a co-chair of the National Invasive Species Council (NISC), Interior was a key partner for the National Invasive Species Awareness Week (NISAW), in Washington, DC, February 26 to March 2. Interior's Deputy Assistant Secretary for Policy and International Affairs, Lori Faeth, joined Catherine Wotecki, Department of Agriculture's Under Secretary for Research, Education and Economics in launching the weeklong event and welcoming the group to Interior's Yates Auditorium. Faeth highlighted Interior's role in the prevention and control of invasive species from local-to-international-levels. The agenda included Federal agency officials who highlighted key issues and accomplishments related to invasive species that impact our Nation's ocean, coastal and Great Lakes resources. <http://www.nisaw.org/2012/index.html>

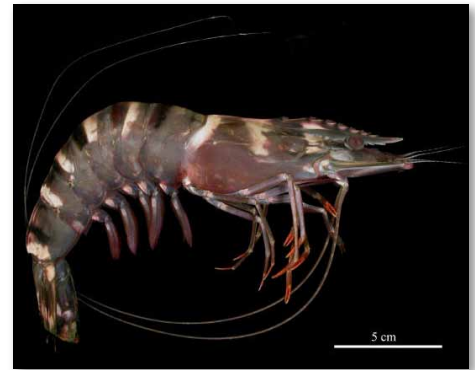
### Highlights:

- John Goss, White House Council on Environmental Quality Asian Carp Director, provided an update on efforts to keep the Asian carp from reaching the Great Lakes. Goss also pointed out that it's not just about carp. He highlighted 90 control actions and other benefits realized by addressing the carp problem. Read more: <http://asiancarp.us/>
- A key paper produced by the Invasive Species Advisory Committee provides recommendations to NISC titled, "Marine Bioinvasions and Climate Change." [http://www.invasivespecies.gov/ISAC/White%20Papers/ISAC\\_Marine\\_Bioinvasions\\_WhitePaper.pdf](http://www.invasivespecies.gov/ISAC/White%20Papers/ISAC_Marine_Bioinvasions_WhitePaper.pdf)
- Representatives from the Fish and Wildlife Service and the Bureau of Reclamation both discussed aspects of managing aquatic invasive species and engaging stakeholders, partners and industry to enhance voluntary, non-regulatory approaches to improving control capabilities such as the spread of Quagga/Zebra mussels (*see related story this issue: Surfing Bison*)

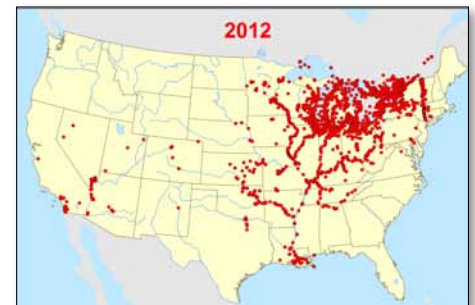
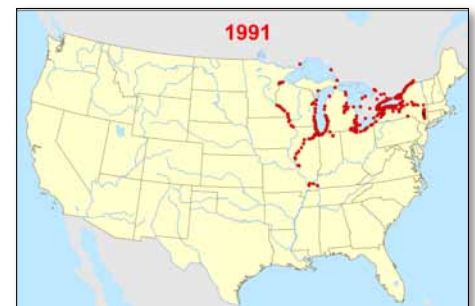
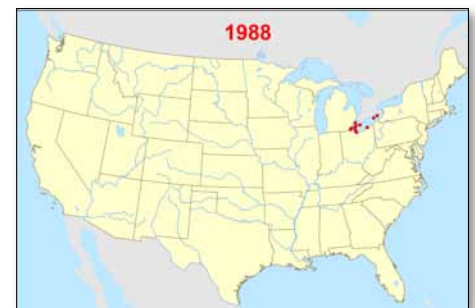
Experts from the US Coast Guard and EPA discussed the latest regulations and issues related to ballast water and National Pollutant Discharge Elimination Systems (NPDES), including the issuance of a treatment standard for ballast water.

DOI agencies play a critical role in addressing the threat of invasive species to oceans and coastal areas. Work in understanding and managing the pathways for the introduction of aquatic invasive species (ballast water, international trade, hull fouling, live bait, intentional introduction and the live food trade) can help prevent and reduce the impact of invasive species. In addition, it is critical to support outreach activities to educate the public about what they can do to minimize the spread of invasive aquatic species.

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



The Asian tiger shrimp has been seen in increasing numbers on coasts of the Atlantic and Gulf of Mexico, raising concerns about its effects on native species. Photo credit: South Carolina Department of Natural Resources.



An example map series from 1988 to the present documents the rapid spread of zebra and quagga mussels from the Great Lakes into the Mississippi River Basin and its major tributaries, and into the western US.

Learn about the USGS Non-Indigenous Aquatic Species Database in the *Surfing Bison* Feature, last page of this issue.



## Protecting America's Rich Maritime Heritage

### *Interior supports a variety of Marine Protected Areas and Activities*

By Valerie Grussing and Ann Tihansky

As an ocean nation, America relies heavily on ocean and coastal resources for a variety of services ranging from food, energy, shipping and independence from shared borders. Healthy coasts and oceans provided a high standard of life for the first Americans and they provide a strong economic foundation for those of modern times. By examining our Nation's maritime heritage we see how healthy coastal and ocean resources have influenced the development of vibrant coastal communities. Through effective stewardship, society can maintain a compatible variety of shipping, fishing, energy development, recreational and cultural activities into the future.

The National Marine Protected Areas (MPA) Center was established under Executive Order 13158 in 2000 to build a science-based, comprehensive National System of MPAs across all levels of govern-

ment. The national system supports economies by helping to sustain fisheries and maintain healthy marine ecosystems for tourism and recreational business, and promotes public participation in the MPA decision-making process. Major goals are to conserve and manage the Nation's natural and cultural heritage as well as maintain sustainable production of renewable living resources. Learn more: <http://www.mpa.gov/> The Cultural Heritage Resources Working Group under the MPA

**Marine Protected Areas-- (MPAs)** are an important resource management tool. Familiar examples include: National Marine Sanctuaries, National Parks, National Wildlife Refuges, and their state counterparts. Earth's oceans are a dynamic and shared resource across the globe. Less than one percent of the total ocean area is protected in any way.

Federal Advisory Committee produced a white paper recommending that national system partners adopt a cultural landscape approach to management. This approach integrates cultural and natural resource management at the landscape level and considers the perspectives of all potential stakeholders.

View the full paper here: [http://www.mpa.gov/pdf/helpful-resources/mpafac\\_rec\\_cultural\\_landscape\\_12\\_11.pdf](http://www.mpa.gov/pdf/helpful-resources/mpafac_rec_cultural_landscape_12_11.pdf)

### **Examples of Interior projects that preserve the history and future uses of maritime cultural resources:**

#### **The Comprehensive Management Plan for the Captain John Smith Chesapeake National Historic Trail**

Recognizing the importance of indigenous perspectives, a team of representatives from NPS, FWS, state agencies, and tribal groups worked to bring the indigenous cultural landscape into the comprehensive management plan. The plan connects interpretive sites within the Chesapeake Bay area as John Smith would have encountered them during his explorations. The process and the product serve as a model for partnership and tribal engagement, as well as implementing a cultural landscape approach. Learn more: <http://www.nps.gov/cajo/index.htm>

#### **100th Anniversary of Titanic**

April 15, 2012 marked the 100th anniversary of the sinking of Titanic on her maiden voyage across the North Atlantic. The NPS and NOAA have drafted guidelines to help protect the site from negative impacts during commemorative visits.

#### **Improved Archeological Analysis of Shipwrecks in Gulf of Mexico**

From Spanish ships to German U-boats, shipwrecks in the Gulf of Mexico represent approximately 500 years of maritime exploration. Secretary Salazar recognized a team of Federal, private sector and academic entities with a "Secretary's Partners in Conservation" award for conducting archaeological analysis and developing preservation protocols for submerged sites in the Gulf of Mexico's outer continental shelf.



Paddlers follow an historical replica of the shallop (boat) that Captain John Smith used to explore the Chesapeake Bay; near Port Deposit, MD. Photo credit: Michael C. Wootton



## Deep Sea Coral Experts at International Symposium

Interior scientists participated in the Fifth International Symposium on Deep-Sea Corals in Amsterdam, The Netherlands April 1-6, 2012. BOEM scientist Greg Boland provided a keynote presentation titled, "Deep Sea Corals and the Oil and Gas Industry in the Gulf of Mexico: An Adaptive Approach to Applied Studies and Management." USGS scientist, Christina Kellogg, presented work on the first deep-sea coral metagenome. A metagenome is the collective genomes of all the microorganisms associated with a particular host, in this case, the cold-water coral *Lophelia pertusa*. The work allows scientists to understand more about the microbial community associated with the coral, and what various organisms are doing. Coral microbial ecology is an important topic since it is fundamental to our understanding of coral health, disease, and resilience.

<http://www.deepseacoral.nl/programme.htm>



A bright orange Brisingid starfish is seen in the lower right amid thickets of live (white) and dead (brown) *Lophelia* coral.



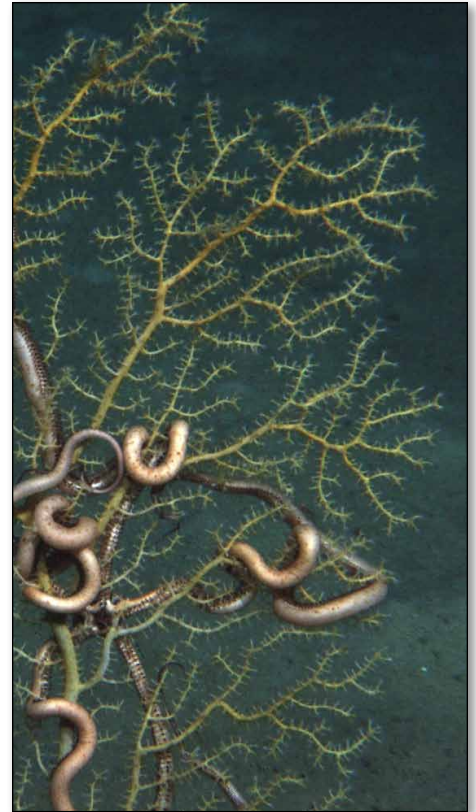
USGS scientist Amanda Demopoulos sorts and identifies animals found in deep sea sediments. Photo credit: *Lophelia II* 2009: NOAA, OER and BOEM.

### Baseline Science for Understanding Deep Marine Ecosystems

Rachel Pawlitz

USGS research benthic ecologist Dr. Amanda Demopoulos studies life on the sea floor to describe what types of organisms typically live together in deep sea communities. Her work involves digging sediment cores from the bottom of the ocean and sorting through the many tiny forms of life found there.

In addition to deep sea coral ecosystems, Demopoulos studies communities in parts of the Gulf of Mexico where oil naturally seeps up from the seafloor and can be a wellspring of life. Chemosynthetic ecosystems -- the ones where food webs are based on chemicals rather than sunlight -- tend to have different forms of life, such as tubeworms. Demopoulos was part of a November 2010 research



A brittle starfish and coral found in the Deep Gulf of Mexico during the 2010 research expedition. Image credit: *Lophelia II* 2010: NOAA, OER, and BOEM.

expedition led by Dr. Charles Fisher, Penn State University and funded by the Bureau of Ocean and Energy Management (BOEM) and the National Oceanographic and Atmospheric Administration (NOAA). The goal of the expedition was to build a scientific understanding of the various undersea ecosystems. It is part of a decades-long collaborative effort among Federal and university scientists to explore deep sea ecosystems to provide sound baseline information for governance decisions about how to best balance natural resource use with protection.

Learn about USGS deep coral research and findings:

<http://fl.biology.usgs.gov/DISCOVRE/>

See more deep sea images:

[http://oceanexplorer.noaa.gov/explorations/10lophelia/logs/slideshow/flash\\_slideshow.html](http://oceanexplorer.noaa.gov/explorations/10lophelia/logs/slideshow/flash_slideshow.html)



expertise will be a major contributor, in partnership with NOAA, EPA, FEMA, DOT and USACE.

These are just a few examples of ways in which the NOP Implementation Plan tracks DOI's on-going contributions to the conservation and management of our ocean, coastal and Great Lakes resources and to using our scientific expertise for these efforts. By establishing or improving interagency partnerships for and coordination of the Federal, Federal-State and Federal-private partnerships that are or will be carrying out these activities, the Plan promotes more efficient use of resources, helps avoid duplication of effort, and makes Federal information more readily available to the public.

## 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 to address common concerns within the regions.*



These are the nine regional planning areas for ocean, coastal and Great Lakes resources: 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.

### Gulf of Mexico

**Linda Kelsey (FWS – DOI Lead)**

Gulf of Mexico Alliance-GOMA

The Navy is the co-lead agency for the NOP-CMSP-Regional Planning Body for the Gulf of Mexico. GOMA, the Federal Working Group to the Alliance, and the Federal representatives identified for the Regional Planning Body (RPB) are working on ways to best coordinate and integrate activities. The GOMA All Hands Meeting is scheduled for June 19-21, 2012 in Corpus Christi, TX. The new NOC Director, Deerin Babb-Brott, has agreed to meet with the four oil producing States (TX, LA, MS, and AL) at the upcoming meeting for further discussion about expressing support for forming the RPB and the CMSP process.

### Northeast

**Bob LaBelle (BOEM)**

Northeast Regional Ocean Council-NROC

On March 12-13, BOEM participated in chairing the first large-scale regional workshop on ocean planning. BOEM participated in moderating sessions and facilitating breakout group discussion. About 175 representatives of Federal, tribal, state, and stakeholder groups in the northeast attended the workshop hosted by the Roger Williams University School of Law in Bristol, RI. The workshop was designed to provide a meaningful forum for stakeholders to engage and contribute to the regional ocean planning process and strengthen the commitment of regional stakeholders. NROC has issued two



See Regions page 18



Monterey Bay in California. Photo credit: Joe Milmoie, USFWS

*Regions continued from page 17*

Requests for Proposals: 1. Sector Specific Workshops in Support of Ocean Planning in New England and 2. Spatial Characterization of Commercial Fishing Activity in New England. A small team of NROC members is involved in reviewing the applications. The next full NROC meeting will be Thursday, May 31 in Portsmouth, NH. NROC hopes to have a Project Coordinator on board by early May.

### Mid-Atlantic

**Maureen Bornholdt (BOEM)**

Mid Atlantic Regional Council on the Ocean-MARCO

The Federal Regional Planning Body (RPB) members convened during the first week of May in Virginia. MARCO continues communication/portal work, as part of the Moore foundation grant, through Monmouth University. MARCO is updating their data portal with grant funding from NOAA. [http://www.midatlanticocean.org/map\\_portal.html](http://www.midatlanticocean.org/map_portal.html)

### South Atlantic

**Eric Strom (USGS)**

South Atlantic Alliance -SAA

On March 8, the Federal Co-lead, Camille Destafney, Navy, convened a conference call for Federal partners to discuss Regional Planning Body (RPB) development. Each partner discussed roles and responsibilities in the region and how these fit into the current CMSP focus areas. Federal partners at the meeting included: Department of Defense (DOD), US Navy, DOD Fleet Forces Command, Department of Transportation Maritime Administration, Environmental Protection Agency, Department of Energy Wind & Water Power Program, Department of Homeland Security - US Coast Guard, Department of Interior-US Geological Survey, Bureau of Ocean Energy Management, Department of Commerce-National Oceanic & Atmospheric Administration, Executive Office of the President-National Ocean Council: Alisa Praskovich.

### Alaska

**Jim Kendall (BOEM)**

Federal Alaska/Arctic Federal Partners met on March 26, 2012. Alisa Praskovich, of the National Ocean Council, provided an update, including how to engage Alaska tribes.

The NOAA has funded the AOOS project for Spatial Tools for Arctic Mapping and Planning, (STAMP). STAMP held an advisory committee meeting April 6th in Anchorage- the project focuses on creating a set of web-based interactive mapping tools that integrate a variety of data types for the State of Alaska, and the North Pacific Fishery Management Council. The tools will be designed to help inform future decision making with respect to potential fisheries development in the Arctic but could be used for other purposes as well. The project's geographic focus is the northern Bering and Chukchi seas.



Submerged Resource Center Archeologist Dave Conlin diving with the propeller and engine of sunken ship Henry Chisolm. Photo credits: Brett Seymour, NPS



## Pacific Islands

### Richard Hannan (FWS)

The Pacific Islands Regional Planning Body (RPB) has made significant progress in administrative support for RPB stand-up, and keeps the RPB Federal representatives informed about relevant CMSP activities. NOAA, the Federal co-lead, has received NOAA funds to hold a data/science workshop in the Pacific Islands Region and is exploring themes and a possible partnership with BOEM.

## Great Lakes

### Phyllis Ellin (NPS), Norm Grannemann (USGS)

The Great Lakes Restoration Initiative-GRLI

The Federal partners of the Regional Planning Body met February 24. On March 12-15, a meeting in La Cross, Wisconsin focused on control and eradication actions and related research findings and needs to address the threat of Asian carp to the Great Lakes. An International Joint Commission study of water levels and flows in the Upper Great Lakes was made public on March 28. Five Great Lakes states and the Federal agencies recently signed a Wind Collaborative MOU. EPA is holding a Lidar workshop to address nearshore mapping needs, including habitat mapping, and USFWS is collecting radar and other information about bird migration to support the Great Lakes Wind Collaborative.

## Caribbean

### Sherri Fields (NPS)

No updates

## West Coast

### Joan Barminski (BOEM)

The West Coast Governor's Agreement-WCGA

WCGA's West Coast Regional Data Network Action Coordination Team (RDN ACT) held a workshop for ACT members and its three technical working groups March 15-16 to draft the ACT work plan that aims to improve access to regional scientific and geospatial data for coastal and marine resource management. DOI participates in the RDN ACT, the Data and Outreach technical working groups. The WCGA Executive Committee is scheduled to meet July 23-24 in San Francisco to plan for 2013. Federal partners are discussing renewable energy, data sharing, lessons learned regarding the Marine Life Protection Act and expectations for NOP-CMSP-RPB activities. Sara Guiltinan (BOEM) attended the NROC regional workshop on March 12-13 and briefed staff working on the West Coast and Pacific Islands RPBs with a summary of the workshop.



## Interior Hosts First International Marine Protected Areas Summit

Senior officials from Marine Protected Area (MPA) agencies of 16 nations gathered at the National Park Service's Maritime National Historical Park, Feb. 13-15, 2012 in San Francisco, California, to discuss how to use their combined influence and efforts to increase the value and success of MPAs worldwide. The participating agencies committed to finding ways to share their experience and lessons learned. Visit the Maritime National Historical Park on-line:

<http://www.nps.gov/safr/index.htm>



Point Lobos State Reserve in California. Photo credit: Joe Milmoie, USFWS

# Tools for Tracking Invasive Species

*The Non-Indigenous Aquatic Species Database*

<http://nas.er.usgs.gov/>

*The Surfing Bison is a regular feature that explores Interior's Coastal, Ocean and Great Lakes topics found on the internet.*



By Rachel Pawlitz

An invasive species is defined as "an alien (or non-native) species whose introduction does, or is likely to cause economic or environmental harm or harm to human health", according to the National Invasive Species Council (NISC) and the Invasive Species Advisory Committee (ISAC). Invasive species, which rank second only to habitat destruction as a threat to native species, can have major impacts on our ocean, coastal and Great Lakes systems.

| Images | Group  | Family       | Scientific Name                            | Common Name             | More Info  | Native Habitat | Exotic / Native Transplant |
|--------|--------|--------------|--|-------------------------|--|----------------|----------------------------|
|        | Fishes | Catostomidae | <i>Carpiodes carpio</i>                    | river carpsucker        | <a href="#">Collection Info</a><br><a href="#">HUC maps</a><br><a href="#">Point maps</a><br><a href="#">Factsheet</a> | Freshwater     | Native                     |
|        | Fishes | Catostomidae | <i>Carpiodes velifer</i>                   | highfin carpsucker      | <a href="#">Collection Info</a><br><a href="#">HUC maps</a><br><a href="#">Point maps</a><br><a href="#">Factsheet</a> | Freshwater     | Native                     |
|        | Fishes | Cyprinidae   | <i>Carassius auratus x C. carassius</i>    | goldfish x Crucian carp | <a href="#">Collection Info</a><br><a href="#">HUC maps</a><br><a href="#">Point maps</a><br><a href="#">Factsheet</a> | Freshwater     | Exotic Hybrid              |
|        | Fishes | Cyprinidae   | <i>Carassius auratus x Cyprinus carpio</i> | goldfish x common carp  | <a href="#">Collection Info</a><br><a href="#">HUC maps</a><br><a href="#">Point maps</a><br><a href="#">Factsheet</a> | Freshwater     | Exotic Hybrid              |
|        | Fishes | Cyprinidae   | <i>Carassius carassius</i>                 | crucian carp            | <a href="#">Collection Info</a><br><a href="#">HUC maps</a><br><a href="#">Point maps</a><br><a href="#">Factsheet</a> | Freshwater     | Exotic                     |
|        | Fishes | Cyprinidae   | <i>Ctenopharyngodon idella</i>             | grass carp              | <a href="#">Collection Info</a><br><a href="#">HUC maps</a><br><a href="#">Point maps</a><br><a href="#">Factsheet</a> | Freshwater     | Exotic                     |

The web-based Non-Indigenous Aquatic Species (NAS) Database- shown above, is an on-line resource that can be used to track trends of invasive species.

The USGS Non-indigenous Aquatic Species (NAS) database is an important tool that helps scientists and managers keep track of trends and evaluate management strategies for dealing with invasive species in both freshwater and marine ecosystems.

The NAS database maintains national records of aquatic vertebrates and invertebrates documented outside their native range. It includes more than 1,100 species found in wetlands, lakes, rivers, estuaries, and coastlines throughout the U.S. and its territories, with the earliest dating back to 1850.

New records are continuously added by NAS program staff at the USGS Southeast Ecological Science Center in Gainesville, Florida, and the database is freely accessible at the public website.

All of the records in the NAS database are occurrences of a species outside its native range, but not all of these species are considered invasive. Because the database tracks sightings regardless of invasion status, it can be used for early detection, education, planning and prevention efforts. For example, the U.S. Army Corps of Engineers used NAS to examine risks of introduction across watershed connections in the Great Lakes, to help prioritize which connections to sever and which to monitor. The U.S. Forest

Service used the database to identify infested source waters, lowering the risks they would unintentionally spread non-native species while fighting fires. Data and reports from NAS have been used to make decisions about Lacey Act listings, and NAS has provided information for Congressional testimonies. Users can view current records for a given species, taxonomic group, watershed, or state.

The NAS also serves up regularly updated factsheets, reference materials, maps, graphs, and charts summarizing trends and composition of introduced aquatic species. Maps produced from the database, such as the mussel maps shown on page 14, are widely used by television, internet, and printed news outlets.