



NEWSWAVE

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

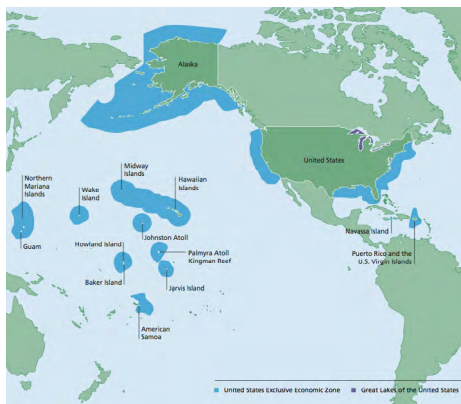
Special Feature—Award-Winning Conservation Signage see p. 18 **Fall 2019/Winter 2020**

Ocean Agencies Meet to Discuss Critical Marine Minerals

By Ann Tihansky (USGS)

BOEM-NOAA-USGS

On July 30 and 31, 2019, the U.S. Geological Survey (USGS) hosted representatives from the Bureau of Ocean Energy Management (BOEM), the National Oceanic and Atmospheric Administration (NOAA), at the USGS Pacific Coastal and Marine Science Center for an “Exploratory Interagency Critical Marine Minerals Discussion” in Santa Cruz, CA. The informal face-to-face meeting covered ongoing and anticipated Federal agency interest and plans related to critical marine minerals. It was the first time that representatives from the three agencies met face-to-face to discuss their specific critical marine mineral plans and activities.



Dark blue areas outline the EEZ of the United States and affiliated islands. The U.S. EEZ is larger than its land area. Image credit: NOAA

See *Ocean Agencies Meet* page 4



USCRTF co-chairs and members visit aboard the sustainable modified traditional model of sailing vessel, Vaka Motu Oceanus, in Koror, Palau. Left to right: Jim Reilly (USGS Director), Doug Domenech (Assistant Secretary Insular and International Areas, DOI), Tommy E. Remengesau, Jr. (President of Palau), RDML Tim Gallaudet (Assistant Secretary of Commerce for Oceans and Atmosphere, NOAA-Deputy Administrator), and Michael Stoker (EPA Regional Administrator, Region 9). Photo credit: Ann Tihansky, USGS

U.S. Coral Reef Task Force Holds 42nd Meeting in Palau

By Ann Tihansky (USGS)

Amid an active typhoon season in 2019, U.S. Coral Reef Task Force (USCRTF) members and supporting staff traveled to Palau, one of the Freely Associated State members of the USCRTF. Palau is the 13th smallest nation in the world, and was the host of the 42nd USCRTF Meeting which was held in Koror, Palau, from September 9 to 13. It had been

See *Palau Task Force* page 32

BSEE Safety Initiatives Support Record Oil Production

By BSEE

See *BSEE Oil Production* page 6

Conserving Leatherback Turtles

By Claudia Lombard (USFWS) and Kelly Stewart (NOAA Affiliate)

Leatherback turtles (*Dermochelys coriacea*) are one of the largest reptiles on Earth.

One of the largest populations of nesting leatherbacks in the United States uses the largest beach area (3.2 kilometers of continuous beach) in the Virgin Islands within the Sandy Point National Wildlife Refuge (NWR) on St. Croix, U.S. Virgin Islands (USVI). The refuge land is greater than 400 acres in extent and was purchased in 1984 to help conserve sea turtles.



DOI Assistant Secretary Doug Domenech (center in black shirt), joined staff from Office of Insular Affairs, USFWS, NPS, and student interns at Sandy Point NWR in St. Croix, USVI. Standing (left to right) Mike Evans, Dwayne Petersen, Deputy Director NPS Dan Smith, Buck Island Reef National Monument NPS Superintendent Gregory Camacho, Doug Domenech, Shreya Banerjee, Claudia Lombard, and Ana Roman. Front row (left to right): Angela Picknell, Dana DeSousa, Nina Mauney, and Emma Dlutkowski. Photo credit: USFWS

See *Conserving Turtles* page 3

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If you have any questions, comments or want to receive NEWSWAVE by email, contact: Ann Tihansky: tihansky@usgs.gov

For more information, contact:

Liza Johnson, Ocean, Great Lakes, and Coasts Coordinator, Office of the Assistant Secretary for Insular and International Affairs
 1849 C Street, NW, Mail Stop 3117
 Washington, D.C. 20240
 Telephone: 202-208-1378
liza_m_johnson@ios.doi.gov



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Oceans of Trash

Marine debris continues to enter the ocean each year, outpacing efforts to remove it.

What’s scarier still: The global problem affects more than wildlife. Plastics have entered the human food chain through the water we drink and the fish we eat. The impact on human health is not yet fully known. But here’s the thing—If we recognize we’re part of the problem, we can take steps to stop it at the source.

See related story, page 22.

Read more: <https://www.fws.gov/refuges/features/OceansOfTrash.html>

<https://www.fws.gov/refuges/features/OceansOfTrash.html>



A Laysan albatross (*Phoebastria immutabilis*) skeleton on Midway Atoll reveals a belly full of plastic. Baby albatrosses born on Midway, more than 2,000 miles from other land, are fed the plastic by their parents. One study by the Monterey Bay Aquarium found that 96% of chicks had plastic in their stomachs. See more photos here: <https://ocean.si.edu/ocean-life/seabirds/laysan-albatrosses-plastic-problem> Photo credit: Chris Jordan (USFWS)

Thousands of pounds of marine debris collect on the shores of Midway Atoll as well as on other remote shores every year. Continual cleanup requires significant management and staff in these remote areas. Photo by Holly Richards, USFWS

NEWSWAVE is a quarterly newsletter from the Department of the Interior featuring ocean, Great Lakes, and coastal activities across the Bureaus.

Visit us online: <https://www.doi.gov/pmb/ocean/newswave>

Editor: Ann Tihansky (USGS)

Technical Editor: Rebekah Davis (USGS); **Layout:** Bethany Fuss (USGS)

Contributors:

- | | | |
|--------------------------|----------------------------|---|
| BSEE | Nadine Leavitt Siak, USFWS | NOAA |
| BOEM | Claudia Lombard, USFWS | Mark Eakin, NOAA |
| Darryl Francois, BOEM | Dawn Marsh, USFWS | Kelly Stewart, NOAA affiliate |
| Michael Plummer, BOEM | Jon Myatt, USFWS | Dan Schneider, White House |
| Christine Taylor, BOEM | Meagan Racey, USFWS | Council on Environmental Quality |
| Marjorie Weisskohl, BOEM | USGS | Edwards Sweeney, Santa Barbara Museum of Natural History Sea Center |
| BLM | Laura Brothers, USGS | Great Lakes Dredge and Dock |
| Jeff Fontana, BLM | Mary Brown, USGS | Great Lakes Piping Plover Conservation Team |
| NPS | Jessica Fitzpatrick, USGS | Monmouth University |
| Michael Bilecki, NPS | Guy Foster, USGS | The Ocean Conservancy |
| R. Jensen, NPS | Jennifer Graham, USGS | University of Wisconsin–Green Bay |
| J. Koster, NPS | Kaitlin Kovacs, USGS | Amy Carrozzino-Lyon, UW–Green Bay |
| Kathy Krause, NPS | Erika Lentz, USGS | Kevin Doyle, photographer |
| Eden Saunders, NPS | Jennifer Miselis, USGS | Cole Goco, illustrator |
| M. Whalen, NPS | Elizabeth Nystrom, USGS | |
| USFWS | Elizabeth Pendleton, USGS | |
| Vince Cavaliere, USFWS | Barry Rosen, USGS | |
| Carol Damberg, USFWS | Pamela Schofield, USGS | |
| Alicia Wilson, USFWS | Heather Schreppel, USGS | |
| Chris Jordan, USFWS | Richard Snell, USGS | |

Conserving Turtles continued from page 1

The U.S. Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration (NOAA) fisheries work together to develop and implement recovery plans for sea turtles, in close coordination with stakeholders. Recovery plans provide a blueprint for conservation of the species and measurable criteria to gauge progress toward recovery. The highly migratory behavior of sea turtles makes them shared resources among many nations, so conservation efforts for sea turtle populations in one country may be jeopardized by activities in another. This means that protecting sea turtles on U.S. nesting beaches and in U.S. waters alone is not enough to ensure the continued existence of the species.

Major recovery actions for leatherback sea turtles include:

- protecting turtles on nesting beaches,
- protecting nesting and foraging habitats,
- reducing bycatch in commercial and recreational fisheries,
- reducing the effects of entanglement and ingestion of marine debris,
- working with partners internationally to protect turtles in all life-stages in foreign waters, and
- supporting research and conservation projects consistent with recovery plan priorities.

Since 1997, schoolchildren and adults from the community have participated in an escorted night visit to the beach to see female leatherback sea turtles digging their nests and laying eggs. Later in the season, program participants watch hatchlings emerge from their nests and crawl to the sea. This program is the premier wildlife outreach program in the USVI and has provided the community with an opportunity to understand the importance of wildlife conservation!

In June 2019, Department of the Interior's (DOI's) Assistant Secretary

Leatherback Sea Turtle Facts

Adult leatherback sea turtles are highly migratory and believed to be the most pelagic of all sea turtles. Habitat requirements for juvenile and posthatchling leatherbacks, however, are virtually unknown. Nesting females prefer high-energy beaches with deep, unobstructed access, which occur most frequently along continental shorelines. Characteristics of these turtles:

- Females weigh on average 600–800 pounds and have an average carapace length of 155 centimeters
- Long distance migrations (St. Croix to Nova Scotia)
- Deep divers
- Leathery carapace
- Feed on jellyfish (*Scyphozoa* spp.)
- Nest March–August
- Individuals nest every 2–3 years
- Lay 80 eggs, every 10 days, up to 10 times in a season



Threats to sea turtles in the marine environment include:

- trawl, purse seine, hook and line, gill net, pound net, longline, and trap fisheries;
- oil and gas exploration, development, and transportation;
- pollution;
- underwater explosions;
- dredging;
- offshore artificial lighting;
- power plant entrapment;
- entanglement in debris;
- ingestion of marine debris;
- marina and dock development;
- boat collisions; and
- poaching.

Threats to sea turtle nesting beaches include:

- nesting beaches and nests lost to beach erosion;
- armoring and adding new sand for beach nourishment;
- artificial lighting; beach cleaning; increased human presence;
- recreational beach equipment;
- exotic dune and beach vegetation; and
- poaching.

Assistant Secretary Doug Domenech holds a newly hatched juvenile leatherback sea turtle that he released into the refuge water. Photo credits: USFWS

for Insular and International Affairs, Mr. Doug Domenech, visited USVI to meet with the Governor and Federal Emergency Management Agency (FEMA) representatives and to discuss hurricane recovery activities in St. Croix and St. John with the National Park Service (NPS) and the USFWS. He visited Sandy Point NWR to meet with refuge staff and learn more about leatherback conservation efforts. Domenech was joined

by NPS Deputy Director Dan Smith, and together they met with the volunteer research assistants who work with the leatherbacks and helped release the hatchlings that had emerged from a nest that afternoon on the south shore of Sandy Point refuge.

The Leatherback Project is a critically important sea turtle research program that has operated for nearly 40 years at Sandy Point NWR. Refuge interns

See Conserving Turtles page 4

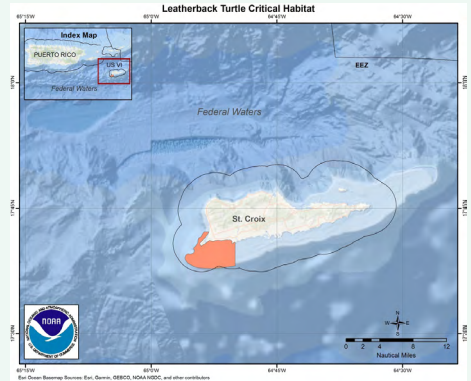
Conserving Turtles continued from page 3
 who are research students from various places are involved in the project. They conduct turtle critical research that involves tracking, marking nests, tagging turtles, and collecting other related data. The results from the science being done at the refuge with leatherback turtles informs management decisions at the national level while also shaping global management decisions and designations. Since 2008, important genetic research on this leatherback population has been done in a partnership among USFWS, NOAA (Marine Turtle Genetics Program), and The Ocean Foundation.

Visit the NWR virtually: https://www.fws.gov/refuge/sandy_point/

Read more about sea turtle conservation efforts: <https://medium.com/@USFWS/protecting-sea-turtles-coast-to-coast-e443518576f1>

Primary sea turtle conservation objectives for the USFWS Sandy Point National Wildlife Refuge:

- To provide habitat and protection for threatened and endangered species, with specific emphasis on the leatherback sea turtle;
- To support the USFWS' commitment to implement and carry out sea turtle recovery plans;
- To provide habitat for a natural diversity of plant and wildlife species; and
- To foster a sense of public commitment and understanding for sea turtles and the need for protection by providing opportunities for environmental education, interpretation, and compatible wildlife-oriented recreation.



In 1979, NOAA fisheries and the USFWS designated critical habitat (shown in orange) for endangered leatherback turtles for coastal waters adjacent to Sandy Point, St. Croix, USVI. Map credit: NOAA

Ocean Agencies Meet continued from page 1

Countries around the world need metals and minerals to satisfy burgeoning demands for technology and electronics, such as wind turbines and electric cars, which require large quantities of rare and expensive metals. Critical minerals are also needed for everyday products such as cell phones, computers, and automobiles, as well as items vital to the Nation's defense. Seafloor deposits in deep ocean settings, from the Arctic to the Antarctic, could be important sources of these metals and minerals. Yet many economic, technological, and environmental challenges to deep-ocean mining remain.

Reliable information about deep-ocean minerals helps stakeholders make informed decisions on resource use, energy production, and environmental impacts. The USGS provides expertise in describing and analyzing these mineral deposits. BOEM is the only Federal agency with the authority to lease marine minerals from the Outer Continental Shelf (OCS).

The meeting was prompted by the June 2019 Department of Commerce (DOC) report, "A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals," and is an important step toward advancing that strategy.

Prepared in response to Executive Order 13817, the report presents:

- 6 calls to action,
- 24 goals, and
- 61 recommendations that describe specific steps that the Federal Government will take to achieve the report's objectives.

Although each agency is actively working to identify internal approaches and strategies to support this Administration's priority, meeting participants brought together a unique assembly of national capabilities and responsibilities to this issue. The meeting will benefit future interagency discussions and effective interagency coordination and collaboration that is expected to expand and evolve.

See related story on page 6

Key meeting objectives were:

Identify key agency structure, groups, or divisions within each organization and points of contact

- Discuss status and plans—including challenges—of intra-agency organizational/planning
- Outline latest Administration plans for formal interagency communication/coordination
- Review state of knowledge of and anticipated commercial interest in domestic sources of critical marine minerals
- Discuss critical marine mineral information needs
- Outline ongoing/planned critical marine mineral activities
- Identify potential near-term (1–3 year) opportunities to enhance data collection/product development to support multiagency objectives
- Assess mechanisms for enhanced interagency communication/coordination at decision-maker levels

Read the DOC report: <https://www.commerce.gov/news/reports/2019/06/federal-strategy-ensure-secure-and-reliable-supplies-critical-minerals>

DOI's Roles and Responsibilities for Critical Marine Minerals

According to the U.S. Geological Survey (USGS) Mineral Commodity Summaries 2020 report, minerals are fundamental to the U.S. economy, contributing to the real gross domestic product at several levels, including mining, processing, and manufacturing finished products. The United States relies on foreign sources for raw and processed mineral materials. In 2019, imports made up more than one-half of the U.S. apparent consumption for 46 nonfuel mineral commodities, and the United States was 100% net import reliant for 17 of those. Critical minerals comprised 14 of the 17 mineral commodities with 100% net import reliance and comprised 17 of the 29 remaining mineral commodities with imports greater than 50% of annual consumption.

Read the USGS report: <https://pubs.usgs.gov/periodicals/mcs2020/mcs2020.pdf>



The USGS studies the seafloor and mineral resources that occur within the U.S. Exclusive Economic Zone (EEZ) of Pacific coastal States, Pacific islands of U.S. affiliation, and areas globally beyond national jurisdictions, seeking to understand how and where mineral-rich deposits form in the ocean and investigating the potential environmental impacts of seafloor mining. These findings can help the Federal Government understand its ocean wealth, help industry determine which regions and deposits might be worth exploring, and help stakeholders understand the effects of mining on the marine environment.

Read more: https://www.usgs.gov/centers/pcm/science/global-ocean-mineral-resources?qt-science_center_objects



BOEM is the only Federal agency with the authority to lease marine minerals from the OCS, including responding to commercial requests for OCS minerals. The Outer Continental Shelf Lands Act (OCSLA) provides the authority to manage minerals on the OCS and the requirement to provide environmental oversight. BOEM's Marine Minerals Program (BOEM-MMP) facilitates access to and manages the Nation's OCS nonenergy marine minerals, particularly sand and gravel, through environmentally responsible stewardship of resources, prudent assessments of exploration and leasing activities. BOEM also coordinates with governmental partners, engagement of stakeholders, strategic planning, and mission-focused scientific research.

Learn more about the BOEM-MMP: <https://www.boem.gov/marine-minerals>

Read the OCSLA: https://www.boem.gov/sites/default/files/uploadedFiles/Section8koftheOCSLA9_5.pdf



Participants in the BOEM-NOAA-USGS discussion held at the USGS Pacific Coastal and Marine Science Center, July 30–31, 2019. Photo credit: USGS

President Accelerates Ocean Exploration and Mapping

By Dan Schneider (White House Council on Environmental Quality)

On November 19, 2019, President Trump issued a Presidential Memorandum, “Ocean Mapping of the United States Exclusive Economic Zone and the Shoreline and Near-shore of Alaska.” The memorandum directs Federal agencies to develop a national strategy to map the U.S. EEZ and a strategy to map the Alaskan coastline to advance our understanding of our oceans and coastlines and to promote efficient permitting related to ocean exploration activities. These actions will benefit the U.S. economy, national security, and our environment.

See related story on page 1.

The memorandum was announced after the White House Summit on Partnerships in Ocean Science and Technology, which was hosted by the Office of Science and Technology Policy (OSTP) and the Council on Environmental Quality (CEQ). The summit brought together leaders from academia, the private sector, philanthropy, and the Federal Government to identify opportunities to build partnerships that advance marine science, promote new technologies, and explore the unknown ocean.

“With today’s Presidential Memorandum, the United States will accelerate ocean exploration and expand our knowledge of the ocean,” said Council on Environmental Quality Chairman Mary B. Neumayr. “The knowledge gained from mapping and exploring the U.S. Exclusive Economic Zone will inform policies and guide actions to promote conservation, management, and balanced use of our ocean.”

“This step forward through partnerships on innovation

and ocean technology will benefit our economy, build on national security priorities, and ensure effective conservation management,” said Dr. Kelvin Droegemeier, Director of the OSTP.

The U.S. EEZ is larger than the combined land area of all 50 States, with more than 13,000 miles of coastline and 3.4 million square nautical miles of ocean within our territorial jurisdiction. It contains a vast array of undiscovered and underutilized natural resources.

However, only about 40% of the U.S. EEZ has been mapped. Even less of the natural resources and ocean systems have been characterized through identifying and evaluating, by executive departments and agencies. Additional mapping and research will improve our national understanding of our oceans, including identifying potential new sources of critical minerals, biopharmaceuticals, and energy, and finding areas with important ecological resources.

Read the fact sheet: https://www.whitehouse.gov/wp-content/uploads/2017/11/20191119-Final-FACT-Sheet_-_Ocean-Mapping-PM.pdf

Read the briefing statement: <https://www.whitehouse.gov/briefings-statements/president-donald-j-trump-accelerating-ocean-exploration/>

Read the memorandum: <https://www.whitehouse.gov/presidential-actions/memorandum-ocean-mapping-united-states-exclusive-economic-zone-shoreline-nearshore-alaska/>



Photo credit: BSEE image

BSEE Underscores Safety

By BSEE

Bureau of Safety and Environmental Enforcement (BSEE) inspectors from all three BSEE regions met in Lafayette, LA, to collaborate on updates to BSEE’s inspection strategy and other initiatives the BSEE is doing to drive safety performance and environmental stewardship improvements in the OCS.

“Everyone in this room plays a critical role in keeping offshore oil and gas operations safe and environmentally sustainable. You are doing more inspections than ever before, you’re increasing physical inspection time offshore, and you’re doing more with less,” said BSEE Director Scott Angelle in referencing BSEE’s nearly 30% reduction in helicopter expenditures over the past two years and the increased use of onshore e-record inspections in his welcoming remarks.

“As we move from being prescriptive to more performance based, initiatives like risk-based inspections positively impact the safety of offshore energy production,” said Angelle. “As you perform these targeted inspections on high-risk activities, operators are driven to direct their attention to areas where BSEE has identified trends.”

Angelle said inspectors are the backbone of BSEE, and he believes these collaborative meetings help ensure standardization across BSEE’s regions.

“You travel offshore daily to ensure offshore oil and gas operations are safe and environmentally sustainable,” Angelle said. “We are all grateful for the work you do. America depends on you.”

Read more: <https://www.bsee.gov/newsroom/latest-news/statements-and-releases/press-releases/bsee-director-underscores-safety-at?fbclid=IwAR3syMMLQD1qDELbIRWKT0Z3oRFzsIV9mG0zui5005MTIKVcPLMHZVPDACU>



BSEE Director Scott Angelle participates in an offshore inspection at a platform in the Gulf of Mexico. Photo credit: BSEE

BSEE Oil Production continued from page 1

BSEE announced on January 7, 2020, that for the first time in history, oil production from the Gulf of Mexico exceeded 2 million barrels per day in August 2019. This record average daily production in the Gulf of Mexico followed on the heels of a record-setting 2018 for the entire OCS, when a total of more than 640 million barrels were produced in Federal waters. Additionally, several BSEE initiatives that began in 2017 are driving offshore safety performance and environmental improvements. These efforts have targeted all three of BSEE's mission areas: safety, environmental sustainability, and resource conservation.

"This is incredible news for the Nation," said BSEE Director Scott Angelle. "BSEE is stressing safety and environmental sustainability while at the same time promoting robust energy production offshore, and it's paying off."

The increase in production in 2019 led to \$2.34 billion more offshore royalty revenue for the Federal Treasury and, according to a U.S. Energy Information Administration report, U.S. Gulf of Mexico oil production not only increased, but will continue to set records through 2020.

BSEE formed a strike team to better manage high-pressure and high-temperature (HP/HT) operating conditions. This led to clear directives being published in three 2019 guidance documents, known as Notices to

Lessees, which set a path for HP/HT projects in the Gulf of Mexico to gain BSEE approval.

Shell's Appomattox project, in the Gulf of Mexico about 80 miles south of New Orleans, was the first high-temperature project to gain BSEE approval and begin production in May 2019.

The permitting work for the Appomattox project helped define and clarify the safety

requirements in BSEE's recently published HP/HT-related guidance documents.

Chevron sanctioned the first ultra-high-pressure project at Anchor in the Gulf of Mexico about 140 miles off the coast of Louisiana. The project represents the industry's first deep-water, high-pressure development at 20,000 pounds per square inch (psi) to win a final investment decision. The BSEE strike team met with Chevron to discuss the guidance.

Chevron subsequently awarded Schlumberger OneSubsea a contract to provide the industry's first fully integrated subsea production-rated system to handle up to 20,000 psi. Chevron relied upon BSEE's safety requirements to incorporate the guidance into its operations. Defining the processes, procedure, and standards has ensured additional energy resources are not abandoned unnecessarily.

BSEE also partnered with BOEM research on the health of energy production in the Gulf of Mexico Shallow Water Province.

Read the report, "Gulf of Mexico Data and Analysis/ Leasing, Drilling and Production, Gulf of Mexico Shallow Water Potential Stranded Assets," <https://www.bsee.gov/sites/bsee.gov/files/reports/shallow-water-report-01.pdf>

Read the press release: https://www.bsee.gov/newsroom/latest-news/statements-and-releases/press-releases/bsee-safety-initiatives-support-record?fbclid=IwAR11wKJfX11p6axWHI86_jXjMLnrkePU0GvkT4AKE2VPUsIthXq1BRmDAM4

BSEE Finalizes Improved Blowout Preventer and Well Control Regulations

By BSEE

BSEE released the "Blowout Preventer Systems and Well Control" regulations in May 2019. BSEE's final well control rule removes unnecessary regulatory burdens to responsible offshore development while maintaining safety and environmental protection.

The revised rule reflects the focus on smarter regulations that provide regulatory certainty, signal American competitiveness, advance energy security, and sustain economic prosperity while promoting safety.

"The final rule puts safety first, both public and environmental safety, in a commonsense way," said Secretary Bernhardt.

"BSEE's review has been thorough, careful, and tailored," said BSEE Director Scott Angelle. "Free of undue regulatory burden while ensuring that operators conduct outer Continental Shelf activities in a safe and environmentally responsible manner, today's rule will fuel and sustain responsible energy exploration and production of America's outer Continental Shelf."

The final revised rule leaves about 80 percent unchanged. BSEE considered all 424 recommendations arising from 26 reports from 14 organizations developed in the wake of and in response to the *Deepwater Horizon* oil spill and found that none of the revisions contravened any of these recommendations.

Read more: <https://www.bsee.gov/newsroom/latest-news/statements-and-releases/press-releases/bsee-finalizes-improved-blowout>



The New Brooks River Bridge at Katmai National Park and Preserve

By NPS

Katmai National Park and Preserve (NP&P) opened a new elevated bridge across the lower Brooks River.

Senator Murkowski’s representative Lucy Murfitt—who, with Annie Hoefler, had the honor of cutting the ceremonial ribbon—predicted that the “bear jams” that had once prevented visitors and staff from crossing the old floating bridge would now be a thing of the past.

The bridge will help Katmai achieve balance in its double mission of protecting resources while also facilitating the public’s enjoyment of them.

“Projects like this take a lot of conversations and a lot of advocacy. Today we can walk across the bridge on a safe, elevated platform and ultimately the bears have freedom of movement that they didn’t used to have,” said Katmai NP&P Superintendent Mark Sturm, thanking partners present at the ceremony for their help in making the bridge project possible. Partners included the National Parks Conservation Association, represented by Erica Carrol, and the Alaska Department of Fish and Wildlife, represented by



Bird’s-eye view of bridge span, elevated walkways, and three large and two small viewing platforms. Photo credit: R. Jensen, NPS

Sara Wolman. Sheila Ring of Katmai Conservancy highlighted the Conservancy’s role in assisting the park with fundraising for its ongoing projects, including the well-known Bearcam partnership with explore.org and the Annenberg Foundation.

Superintendent Sturm also highlighted the importance of Alaska Native community input during the long course of the bridge construction project, “It is important to recognize that we are standing on sacred ground that has literally been occupied for many

thousands of years. And that this construction represents progress. And with progress comes change. Sometimes the change is not always perceived as positive change because when something does change, there’s something that’s lost as well.”



“Welcome to Sugpiaq country,” proclaimed Andria Agli (BBNC) and the Council of Katmai Descendants, with NPS Alaska Region Director Herbert Frost and Katmai NP&P Superintendent Mark Sturm. Photo credit: J. Koster, NPS

“A lot of folks come here to see the bears, and we like to be able to share our story as well. So, thank you for being here. As you partake in this beautiful bridge, also marvel in the beauty of this area and the history as well,” said Andria Agli of Bristol Bay Native Corporation (BBNC) and the Council of Katmai Descendants. She greeted the crowd and recalled the rich cultural heritage of the area, spanning thousands of years from traditional migrations to present day.

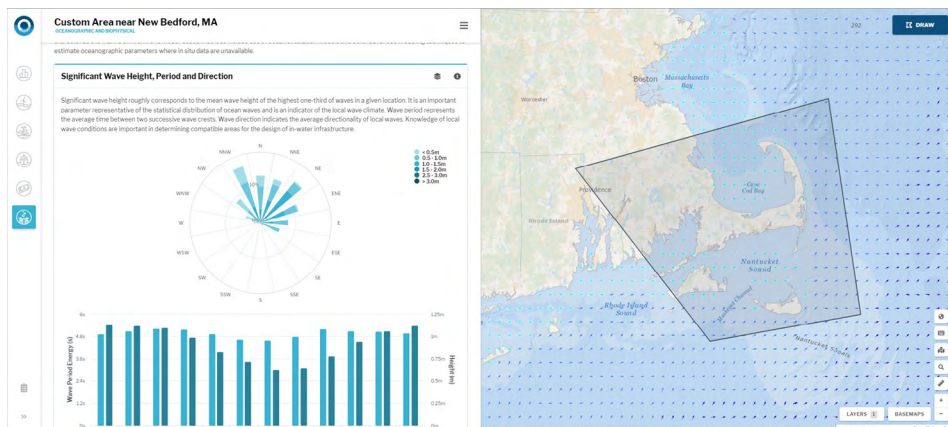
Read more: <https://www.nps.gov/katm/learn/news/news063019.htm>



Visitors enjoy the elevated perspective on bear activity below. Watch the live action via BearCam: <https://explore.org/livecams/brown-bears/river-watch-brown-bear-salmon-cams> Photo credit: M. Whalen, NPS

Ocean Reports—Delivering Ocean Data for Your Project in an Instant

By Christine Taylor (BOEM)



The new tool, OceanReports, is available at <https://marinecadastre.gov/oceanreports> and provides users specialized ocean neighborhood analyses, including maps and graphics, by analyzing more than 100 authoritative ocean datasets instantaneously. Powered by over 100 trusted datasets, you can create stunning customized reports in just seconds. Image credit: BOEM

A new, web-based interactive tool for ocean mapping and planning created by DOI’s BOEM and the DOC’s NOAA will give everyone from ocean industries to coastal managers, students, as well as the general public, the opportunity to be an ocean explorer right from their own computer.

U.S. ocean waters comprise nearly four million square miles and are one of the largest EEZs in the world. Now, when you outline any area in the U.S. EEZ using the OceanReports app, you can get detailed information about habitats and species, industries at work, potential hazards such as undersea cables or shipwrecks, economic value of ocean commerce, and detailed oceanographic information.

“With such a diverse range of ocean uses and stakeholders, the OceanReports tool greatly increases one’s ability to understand and manage the resources in the complex ocean environment,” said BOEM Acting Director Walter Cruickshank. “Our team worked diligently with NOAA to create this tool, which benefits the ocean community in addition to helping BOEM carry out its mission—the responsible development of ocean energy and marine mineral resources for the Nation.”

“The world’s largest collection of ‘ocean intelligence’ can now be accessed to help sustain and grow one of the world’s largest blue economies,” said Neil Jacobs, Ph.D., acting NOAA administrator. “Whether it’s aquaculture siting, marine transportation, or offshore energy, OceanReports puts this data at our fingertips and gives us an edge as we continue to grow our national economy.”

OceanReports builds on more than a decade of data collection and transforms seemingly disparate ocean information into something useful to the Nation’s ocean and coastal industries, which consistently adds more than \$300 billion in gross domestic product to the Nation’s economy annually. And although OceanReports provides a fountain of data for use by industry and science, it is still easy enough to use in the classroom to help students studying biology, chemistry, geography, and even other disciplines like economics.

“OceanReports is a monumental advancement for all ocean industries,” said James Morris, NOAA marine ecologist and member of the OceanReports development team. “New industries such as aquaculture and existing industries such as energy and shipping will all benefit from

having easy access to this unprecedented volume of ocean intelligence. Everyone will now be better informed and positioned to conserve marine resources and grow ocean commerce to new levels.”

OceanReports is an example of strong Federal interagency coordination and cooperation on ocean policy, as put forward by the President’s Executive Order 13840, signed June 19, 2018: <https://www.whitehouse.gov/presidential-actions/executive-order-regarding-ocean-policy-advance-economic-security-environmental-interests-united-states/>.

“Using maps and related data to determine the what, where, and how answers to many commonly asked marine planning questions, on the fly, is something the MarineCadastre.gov team has been wanting to do for years” said Christine Taylor, BOEM geographer and co-lead for the MarineCadastre.gov project.

The tool can answer basic and somewhat complicated questions about your area of interest (for example, depth ranges, existing leases, transportation corridors, infrastructure existence, oceanographic conditions, available ports, ocean laws, Federal and State lawmakers for your area, economic information, and so on). It has all the information you need to determine both the best conditions for your potential plan along with the likely potential conflicts.

If you don’t like your results for one area, just draw another one. Save all your reports, share them with others, and select just the infographics you need for printing your report.

If you need to dig deeper into the data, everything is downloadable for use in your own geographic information system (GIS). Most of the data are already available in MarineCadastre.gov along with hundreds of other



Watch this short video demonstrating the OceanReports tool: <https://coast.noaa.gov/data/gallery/videos/oceanreports.mp4>

Ocean Reports continued from page 9

geospatial data layers. Those data layers created specifically for OceanReports will be transferred to MarineCadastre this year (2020). Many of these layers and others are also available from some of the regional ocean data portals. OceanReports is meant to be a complement to these other valuable tools.

In some cases, we've linked to other reporting tools such as the Avian Knowledge Network (<http://avianknowledge.net/>), and the Information for Planning and Consultation (IPAC; <https://ecos.fws.gov/ipac/location/index>) site. These are similar tools where you can do thorough investigations of data related to birds and species listed under the Endangered Species Act (ESA). You can also find links to NOAA fisheries tools such as the ESA Threatened and Endangered Species Directory: <https://www.fisheries.noaa.gov/species-directory/threatened-endangered>. OceanReports will continue to link to other valuable resources as they become known to the team. Linking to and working with other authoritative geospatial tool sources reduces redundancy of work and spending and encourages partnerships.

The MarineCadastre.gov team would love to hear what you think. Send them your user story and they can feature you in their user map. Or tell them what you do and don't like—they can't improve or change without your feedback. Email: info@marinecadastre.gov

Knauss Fellows Get Interior's Blue Portfolio Briefing Plus Lunch with a Leader

By Alicia Wilson (USFWS Coastal Program 2019 Knauss Fellow)

More than 20 of the 2019 class of NOAA's Sea Grant Knauss Fellows participated in "DOI Day" in November. DOI Day is a traditional professional development event where Fellows from a range of Knauss Fellow host offices, such as from NOAA, Marine Mammal Commission, Congress, U.S. Navy, the Committee on Marine Transportation, and USFWS, are invited to learn more about DOI's Blue Portfolio from leadership across the DOI. It was hosted by Liza Johnson, DOI's Ocean, Great Lakes, and Coastal Program Coordinator, at the Main Department of Interior's building in Washington, DC.

In its 7th year, DOI Day provides an opportunity for Fellows, many in organizations outside DOI, to learn about the oceans, Great Lakes, and coastal activities happening across DOI's Bureaus. Liza Johnson, with the Office of the Assistant Secretary for Insular and International Affairs, gave the opening remarks and overview for the DOI Blue Portfolio. A panel of seven professionals from the USFWS, USGS, NPS, and BOEM presented overviews of each Bureau's ocean and coastal work followed by question and answer sessions in small groups for more in-depth career discussions and networking. Fellows and panel members took a guided museum and mural tour that finished with a visit to the rooftop for a view of the D.C. skyline. The Fellows continued networking offsite.

The new Knauss Fellow program "Lunch with a Leader" kicked off just before the annual DOI Day. More than 10 participants met with Cynthia Martinez, Chief of the USFWS National Wildlife Refuge System. In a small, intimate setting over lunch, Fellows were able to listen as Cynthia shared her career path, successes, and struggles. They were also able to ask questions related to career advice, job opportunities, and challenges facing young professionals looking for Federal Government employment.

The Sea Grant John A. Knauss Fellowship provides an exceptional opportunity for young professionals to engage in policy related to ocean, coastal and Great Lakes resources and issues. Fellows are matched with host offices in the legislative or executive branch of government for a one-year paid fellowship in the Washington, D.C., area.

Learn more about the Knauss Fellowship: <https://seagrant.noaa.gov/Knauss>

Plan a visit to the DOI Museum: <https://www.doi.gov/interiormuseum/Plan-a-Visit>.



2019 Knauss Fellows on the Main Interior Building's rooftop in Washington, D.C. Photo credit: Carol Damberg, USFWS

Interagency Relations Streamline Process to Restore Brown Pelican Rookery

By Nadine Leavitt Siak (USFWS)

“Good Queen Bess” (a.k.a. Queen Elizabeth) is credited with putting an end to a period of instability in mid-16th century England. Unfortunately, the tiny scrap of land in Louisiana that bears her name, Queen Bess Island, has been anything but stable. The island, about 2.5 miles north of Grand Isle in Barataria Bay, has been sinking and eroding into the Gulf of Mexico. This is a matter of grave concern because Queen Bess Island supports the third largest brown pelican (*Pelecanus occidentalis*) rookery in Louisiana and provides the only colony for the birds in Barataria Bay.

Less than 5 acres of suitable nesting and brood-rearing bird habitat remain on Queen Bess Island, so immediate action is needed to stop the erosion and rebuild what has been lost. A regulatory process and the issuance of a permit by the USACE must be completed before a project can be implemented on the ground.

Using \$18.7 million of *Deepwater Horizon* Natural Resource Damage Assessment (DWH NRDA) settlement funds from the *Deepwater Horizon*



Queen Bess Island is the third largest nesting colony in Louisiana and the only one for brown pelicans in Barataria Bay, LA. Photo credit: USFWS

oil spill, a restoration effort adding 37 acres of prime nesting habitat was planned for October 2019. If not for a remarkable regulatory feat, project managers would have had to wait another year to start the project. The USFWS streamlined the environmental compliance process, including taking on some of the compliance review, to enable the U.S. Army Corps of Engineers (USACE) to issue a permit for the project in only two days.

“This greatly simplified the process for them. It reduced their workload, led to a faster permit authorization,” Erin Chandler, an environmental compliance coordinator for USFWS’s *Deepwater Horizon* Gulf Restoration Office (DWH GRO) says. “We effectively front-loaded regulatory compliance and made it easier for the USACE to conduct their permit application review.”

Together the agencies “were able to identify where our processes overlapped, developed a plan, and executed it accordingly. For the USACE, it saved man-hours—not days, but months—and for [USFWS] it resulted in a timely permit decision,” said Brad LaBorde, USACE New Orleans District Regulatory Branch

Restoration activities can’t take place on Queen Bess Island while birds are nesting, which leaves only a six-month window to get work done. “This is a reason why a speedy compliance review was so important. If the restoration work is not started before nesting begins, we would have to wait and we’d lose more of the island—and without restoration, we will lose that nesting colony within the next decade,” said John Tirpak, USFWS wildlife biologist.

“We need to make sure to have brown pelicans in all locations where they were historically,” Tirpak says. “So, if, God forbid, a hurricane knocked out a colony, there would still be others.”

“The speed with which the Queen Bess Island compliance and permitting process were completed was made possible by USFWS’s strong relationships with other DWH NRDA implementing agencies. Maintaining these cooperative relationships with our restoration partners is paramount to protecting and restoring the Gulf ecosystem,” said Chandler.

Read more: <https://www.doi.gov/restoration/environmental-compliance-efficiencies-speed-restoration-important-brown-pelican-rookery>



An adult brown pelican watches over two pelican chicks on Queen Bess Island, LA. Photo credit: USFWS

Western Snowy Plovers Return to Humboldt Bay South Spit, CA

By Jeff Fontana (BLM)

Bureau of Land Management (BLM), Humboldt State University’s wildlife department and Dr. Mark Colwell, Ph.D., and Humboldt Bay NWR have been critical partners in restoring critical habitat.

“If you build it, they will come, and we are happy to be realizing that spirit of optimism,” said Molly Brown, manager of the BLM Arcata Field Office.

But there is a backstory—For nearly two decades, BLM staff in Arcata have been grooming beach habitat to encourage nesting by western snowy plovers (*Charadrius nivosus nivosus*), small shorebirds that are listed as a threatened species. For much of that time, BLM staff were disappointed when the birds ignored the new nesting areas.

That all began to change in 2016, when increasing numbers of fluffy, spotted plover chicks began appearing on the restored habitat beaches of the Mike Thompson Wildlife Area, South Spit, Humboldt Bay. The staff were thrilled at the end of this year’s record setting nesting season when 37 chicks fledged on BLM’s South Spit habitat.

“The South Spit fledglings represented more than 50 percent of the chicks fledged during the 2019 breeding season in a snowy plover recovery area that includes beaches in Del Norte, Humboldt, and Mendocino counties. A total of 58 chicks fledged in the entire recovery area, up from 48 a year ago,” said Brown.

The BLM Arcata Field Office manages 51 acres of breeding habitat for western snowy plovers that prefer to lay their eggs on wide-open expanses of beaches, where they can easily see and ward off predators. To improve nesting habitat, BLM crews work

Help Protect Shorebirds Let ‘em Rest, Let ‘em Nest

A trip to the beach can be relaxing for humans, but may disturb shorebirds.

Share the shore:

- Leave no trace—Do not litter or feed wildlife.
- Give shorebirds plenty of space—300 feet is ideal! If birds run or fly away from you, then you are too close.
- Leash dogs—Birds see dogs as predators, and when dogs chase birds, it can result in stress, injury, or even death. Never allow dogs to chase birds.
- Avoid flying kites near posted nesting areas—Shorebirds often mistake kites for predatory birds, causing them to stop feeding.
- Respect closures for wildlife—Do not enter areas that have been roped off for nesting or resting birds. Obey all posted signs.
- Keep dogs and vehicles out of restricted areas—Take your furry companion to another section of beach. That includes your wheels, too—do not drive or ride beyond the high tide line.
- Share the knowledge—Help others to appreciate shorebirds and politely let them know how their actions may be negatively affecting the wildlife. It is likely that they are unaware of the consequences of their actions. If you suspect someone is intentionally harassing or harming wildlife, please contact your local wildlife managers or USFWS office.



For more ways to help: <https://ny.audubon.org/10-ways-help-beach-nesting-birds>. Photo credit: USFWS

outside of breeding season using heavy equipment such as bulldozers and agricultural tractors with discs to remove invasive European beach grass and add oyster shells to the beach surface. The Mike Thompson Wildlife Area, South Spit, Humboldt Bay offers miles of nearly deserted beaches about 15 miles southwest of Eureka, CA. Although access is restricted within snowy plover areas during nesting season, the spit provides Pacific Ocean beach access.



Western snowy plover chicks on a section of restored beach habitat. Photo credit: BLM

Learn more: <https://www.blm.gov/press-release/snowy-plovers-returning-restored-habitat-humboldt-bay-south-spit>

Wings of Hope in the Great Lakes

Long-Term Dedication for Restoration Projects Pays off for Threatened and Endangered Shorebirds

By Dawn Marsh (USFWS)

This story was adapted from “Wings of Hope: A Restoration Connection,” https://www.fws.gov/home/fwn/pdf/Summer-News19_final.pdf

Waugoshance Point extends west, pointing into northern Lake Michigan, is close to Wisconsin’s northeastern shore, and is in the middle of the Great Lakes. More than 200 miles from any major city, it was once a Great Lakes piping plover (*Charadrius melodus*) stronghold that served as one of the last nesting locations when the plover population was at its low point. Yet even as the plovers began to rebound in the 1990s and 2000s, the habitat on Waugoshance Point was deteriorating and the birds did not want to nest there. After extended periods of low lake levels, the beaches became crowded with vegetation.

In 2013 and 2014, the USFWS’s Coastal Program began working with partners at the Michigan Department

of Natural Resources and USGS, improving the beach habitat around the lake by grading the slope and removing vegetation, creating habitat more suited for the piping plover. With some of that work located within Michigan’s Wilderness State Park, staff returned each year to monitor and maintain the sandy, sparsely vegetated habitat and finally, in 2016, their efforts were rewarded with nesting plovers. In 2018, there were three nests. The beginnings of an amazing recovery were taking shape.

Conservation work by a wide variety of Federal, Tribal, State and private partners has already paid huge dividends, helping a nearly extinct population (12 breeding pairs in 1990) rise to 68 pairs in 2018. In recent years, the Great Lakes piping plover population has also begun to expand geographically to the range they once covered. The exciting news is that



Follow the Great Lakes Piping Plover Conservation Team: <https://www.greatlakespipingplover.org/>

2018 is the first year in many decades that piping plovers nested on all five of the Great Lakes.

Researchers from the University of Minnesota carefully put colored leg bands on Waugoshance Point’s newly hatched chicks that summer. The bands help biologists track the birds and use that information for management strategies, providing critical information on each bird as it migrates from the Great Lakes to the southeastern United States every July or August staying until April or early May. Piping plovers face numerous threats throughout their range, especially habitat loss from development and human presence.

One of the chicks hatched at Waugoshance Point, a female, was found in Cumberland Island National Seashore, an important protected coastal area with limited development along the Georgia coast. She found herself in good company—at least 18 other plovers identified from the Great Lakes population were also spending their winters on the island or on nearby beaches.

After surviving the hurricane season on Cumberland Island, this tenacious little bird returned to the Great Lakes ready to take advantage of the hard work the USFWS and its partners had put into re-creating breeding habitat for a variety of bird species there. Discovered in another restored area, the Cat Island Chain, the plover found the local community was invested in her survival too. The nearby Titledown Brewing Company crafted a beer named the “Piping Plover Reserve” and designed commemorative pint glasses to raise awareness and funds for the project.

This conservation success story is possible due to dedicated volunteers,



Historic Great Lakes Piping Plover Range



Late 1980s Great Lakes Piping Plover Range



2015 Great Lakes Piping Plover Range



2019 Great Lakes Piping Plover Range

Historically, an estimated 500–800 pairs of piping plovers nested throughout the Great Lakes. By the mid-1980s the population had declined to 11–14 pairs, limited to Michigan. Population dropped to 67 in 2018. Although the breeding population is now expanding, the plover is still extremely vulnerable. Image credit: Great Lakes Piping Plover Conservation Team

See *Wings of Hope* page 27

Wings of Hope continued from page 26

partner organizations, Tribes, universities, and agencies that come together to restore key habitats and to conduct research and monitoring of this endangered shorebird. The story is still far from over. Much work remains as new and old threats continue to put pressure on the birds and the population is still only about halfway to the 150-pair recovery goal needed to leave the “List of Endangered and Threatened Wildlife.”

Learn more: <https://www.fws.gov/midwest/endangered/pipingplover/>

The Cat Island Chain Restoration Project—Over the next 20 to 30 years, one goal of this project is to boost Great Lakes piping plover population numbers. With ingenuity and community support, the project has already doubled the number of breeding sites in Wisconsin. Although only two North American shorebird species, the piping plover and red knot (*Calidris canutus*), are protected as threatened under the Endangered Species Act, almost all shorebird species are of conservation concern due to the ongoing threat of habitat loss. Read more: <https://www.doi.gov/restoration/restoring-cat-island-chain-green-bay-wisconsin>

Read this USFWS article: <https://medium.com/usfishandwildlifeservicenortheast/plovers-and-people-an-essential-union-cf84cf66761f>



Leg bands on this female piping plover give scientists the ability to gather information on migration, mortality rates, and range expansion. Photo credit: Vince Cavalieri, USFWS

Innovation and New Technology Still Rules at Kill Devil Hills, Outer Banks, NC

By NPS

The new visitor center at the National Historic Landmark—the Wright Brothers National Memorial—recently was certified “LEED Gold” by the Leadership in Energy and Environmental Design (LEED). Along with new upgraded exhibit space, it now features new “green” energy-saving aspects, including optimized energy performance, reduced carbon dioxide emissions, and increased water efficiency.

The U.S. Green Building Council developed an internationally recognized green building certification system. “The LEED certification process is rigorous and takes a lot of people working in a lot of different directions to achieve certification,” said David Hallac, Superintendent, National Parks of Eastern North Carolina.

From 1900 to 1903, Wilbur and Orville Wright used a group of sand dunes known as the Kill Devil Hills in Kitty Hawk, on the Outer Banks of North Carolina, to conduct many of their flying experiments. Although these historical achievements defined early advancements in American aviation history, the spirit of advancing new technology is still present in the Outer Banks.

Plan your visit: <https://www.nps.gov/wrbr/planyourvisit/index.htm>



Above, the Wright Brothers National Memorial Visitor Center in 1962. Photo credit: NPS. Left, the new Wright Flyer at the newly renovated visitor center. At bottom the new LEED certified version, which was reopened in October 2018. Photo credits: Eden Saunders, NPS



BOEM Sand Restores Louisiana's Gulf Coast

By Michael Plummer (BOEM)

In June 2019, BOEM and the State of Louisiana's Coastal Protection and Restoration Authority (CPRA) signed two agreements to aide in restoring Louisiana's Gulf coast. With a combined volume of about 10 million cubic yards of sand from Federal waters, the project will restore the beach, dune, and marsh habitat along Trinity-East Island, Timbalier Island, and West Belle Barrier Headland.

"In addition to facilitating recovery of Gulf wildlife from the oil spill, this project will also make great strides to supplement the deficit in the coastal sand budget for this portion of the Louisiana coast," said BOEM Gulf of Mexico Regional Director Mike Celata. "This project will directly restore the function of the Terrebonne Basin Barrier Islands and West Belle Barrier Headland, increasing their resiliency against damage from future storms."

Nearly seven miles of shoreline and 1,400 acres of beach, dune, supratidal, and marsh habitats will be restored using sand from the OCS on Trinity-East Island, Timbalier Island, and West Belle Barrier Headland. In addition, the project will create a 68-acre feeder beach for West Belle Barrier Headland. The restoration

effort will provide and improve habitats for marine and estuarine fisheries resources and their forage species, for sea turtle nesting, as well as for a wide variety of avian communities including shorebirds, wading birds, colonial nesting birds, and migratory songbirds.

"BOEM has been a great partner in supplying CPRA with material to restore and protect Louisiana's coastal perimeter," said CPRA Executive Director Bren Haase. "Using sediment mined from federal waters like BOEM's Ship Shoal—along with other sources—CPRA has restored and nourished more than 60 miles of barrier islands, berms and shorelines using approximately 57 million cubic yards of dredged material. BOEM's contribution to our efforts has been invaluable."

The overall project is one of several that the State of Louisiana's CPRA is developing to address the impacts of the *Deepwater Horizon* oil spill and work toward the long-term recovery of the coast. This restoration effort is funded through the Gulf Environmental Benefit Fund, which is administered through the National Fish and Wildlife Foundation.

Learn more: <http://coastal.la.gov/>

Building a National Offshore Sand Inventory

Erosion along the Nation's shorelines is a serious issue that affects coastal communities, estuarine ecosystems, energy production, defense, and public infrastructure, as well as tourism. BOEM supports the restoration and protection of our coasts to provide long-term resilience to these coastal communities and to support the local, State, and national economies.

OCS sand and gravel resources are vital sources of material for the construction of coastal protection and restoration projects, including efforts to protect coastal communities, national defense facilities, and Federal and State infrastructure. The demand for OCS sediment continues to grow as both planned projects and emergency response activities use these resources to restore damaged areas.

Since 1995, BOEM has issued 58 leases to convey over 162 million cubic yards of OCS sand for projects to restore about 346 miles of the U.S. Atlantic and Gulf coasts. About 63 million cubic yards of OCS sand have been leased to restore Louisiana's coast.

Learn more: <https://www.boem.gov/marine-minerals/building-national-offshore-sand-inventory>

Read about BOEM's Marine Minerals Program: <https://www.boem.gov/Marine-Minerals-Program/>



OCS sand was used to restore the Caillou Lake Headland in offshore Louisiana. Photo credit: Great Lakes Dredge and Dock



Coastal erosion along Florida's Panhandle after Hurricane Ivan in 2004. Photo credit: USGS

Projecting Future OCS Sand Resource Needs

By Marjorie Weisskohl (BOEM)

The BOEM–MMP is receiving increasing requests for OCS sediment used in coastal restoration projects. Increases are driven primarily by diminishing resources in State waters, combined with the frequency and magnitude of coastal storms and need for new infrastructure.

To help prepare for and meet future sand resource needs, the MMP funded the study, “Projected OCS Sand Resource Needs and Effort.” and published in 2018 a report that summarizes a forecast of activities that could require OCS sand resources through 2028. The report outlines several possible scenarios to help estimate future need and the research required to meet the demand with three major conclusions: more States will turn to OCS sediment resources as in-State resources become scarcer, the volumes requested will be larger to support increasing coastal resilience measures.

The study compiled coastal project data from different sources; publicly available databases, project reports, and online permits. BOEM recognizes there are data gaps to be filled through future coordination at the local level, and there is inherent uncertainty when projecting where future major storms will hit and cause an increase in demand. Potential followup studies would attempt to close many of these data gaps and refine the forecast to improve its usefulness to coastal managers and could help with avoiding conflicts with other activities on the seafloor, such as oil and gas pipeline access and offshore wind energy planning.

See related stories, pages 1 and 15

This report supports BOEM’s development of a National Offshore Sand Inventory: <https://www.boem.gov/newsroom/notes-stakeholders/new-boem-report-projects-future-ocs-sand-resource-needs>

Interactive Web Product Explores Decades of Coastal Change at Fire Island, NY

By Erika Lentz (USGS), Jennifer Miselis (USGS), Richard Snell (USGS), Heather Schreppel (USGS), Kathy Krause (NPS), and Michael Bilecki (NPS)

More than 20 years of USGS research illustrates key concepts about the dynamic nature of coastal environments.

The USGS released “Coastal Change at Fire Island” a geonarrative (also called a “Story Map”) putting coastal change concepts into an easily accessed format using mobile devices and tablets. USGS and NPS staff at Fire Island National Seashore collaborated to present the science of coastal change along Fire Island beaches that can be used as a learning resource for educators, students and the general public and to train staff and interns. The interpretive staff at Fire Island National Seashore plan to use this tool for their professional development efforts and share it with onsite and virtual park visitors.

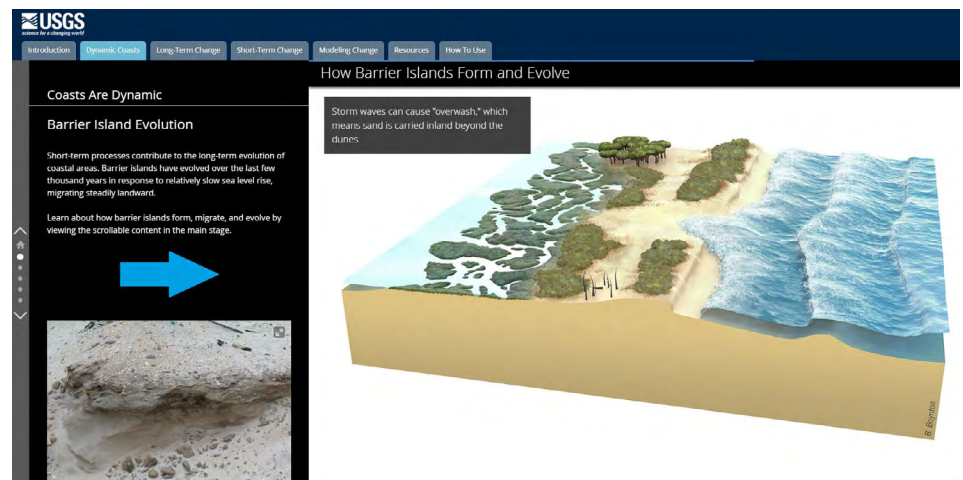
The geonarrative covers a range of topics, including the processes that shape the dynamic barrier island environment, coastal change over short- and long-term periods (including

storm response and recovery), tools that coastal researchers use to measure these changes, and how models help scientists and managers better understand and predict the type and timing of changes, and where they are likely to occur in the future.

The Story Behind the Story Map

The collaborative approach to developing the story map was built on partnerships that have grown from the sustained research presence the USGS has had on Fire Island for more than 20 years. USGS personnel met with NPS decision makers and support staff to discuss information needs, the intended audience, and potential platforms for the web product. A geonarrative format was selected to deliver a straightforward, interactive and compelling resource to enliven science concepts. The team focused on ensuring the science and illustrations were accurate and useful to informal educators.

To create the geonarrative, NPS staff shared insights on the experiences and mediums they have been most effective in their interactions with the public. They also had specific needs for additional information and visualization concepts they wanted the educational product to include. Preliminary exchanges between USGS and NPS staff as part of the content



The geonarrative uses illustrations to describe coastal change concepts. Image credit: USGS

See Explore Fire Island page 14

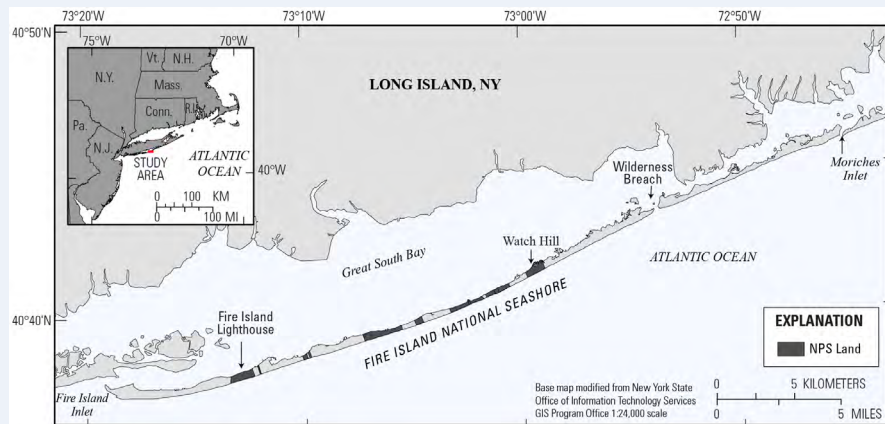
Fire Island, NY

Fire Island is the largest island within the coastal barrier island system offshore of the southern coast of Long Island, NY, and is separated by the Great South Bay. Located about 60 miles east of New York City, it is home to 17 communities and is a popular summer vacation destination. A large part of the island is managed by the NPS as National Seashore and Federal wilderness areas accessible to the public.

The island is about 30 miles long, with its width varying from 500 to 1,300 feet, and continually changes dimensions over time in response to storms, sediment availability, and long-term sea-level rise. In 2012, Hurricane Sandy breached Fire Island in three places. Two of the breaches were filled, but the third has remained an inlet and is evolving naturally under NPS management. The USGS and NPS have worked together to better understand natural coastal processes to preserve and manage the coastal system and associated natural habitat and resources effectively.

Learn more about the park: <https://www.nps.gov/fiis/index.htm>

Read about USGS research in the park: https://www.usgs.gov/centers/spcm/science/coastal-system-change-fire-island-new-york?qt-science_center_objects=0#qt-science_center_objects



Fire Island and vicinity with NPS areas delineated. Image credit: USGS

Explore Fire Island continued from page 15

design phase helped prioritize elements to highlight and enhanced the ability for scientists to design and deliver the information in the most preferred and useful formats for NPS officials to use.

Scrollable animations illustrate coastal change concepts, interactive shoreline change maps, and highlight the tools and methods used to collect coastal change data. There are also step-by-step narratives that help users see how data are plotted and interpreted. These guide the user—whether a park interpreter or natural resource intern, Earth Science educator, or park visitor—to understand what scientific modeling

is, why it is used, how it incorporates observational data, and how it is used to evaluate coastal change. The NPS is currently exploring options for sharing, including the potential for access through tablets at park visitors centers and posted QR codes in strategic locations throughout the park.

Take a peek of some images highlighting content from selected navigational tabs. Each page is scrollable and has multiple embedded sections that are designed to engage users, encourage exploration, and improve scientific literacy on coastal change concepts.

View the geonarrative: <https://wim.usgs.gov/geonarrative/ficc/>

Optimizing Continental Shelf Seafloor Mapping

USGS and NOAA Merge Collections

By Elizabeth Pendleton (USGS), Laura Broth-ers (USGS), and Edwards Sweeney (Santa Barbara Museum of Natural History Sea Center)

The USGS and NOAA have collected seafloor mapping data on the Atlantic continental shelf between Delaware and Virginia over the past 15 years. Although originally acquired for different objectives, the comprehensive coverage and variety of data (bathymetry, backscatter, imagery, and physical samples) present an opportunity to merge collections and create new high-resolution, broad-scale geologic maps of the seafloor using machine learning.

These new geologic data products can be used to identify sediment sources, inform resource management, link seafloor environments to sediment texture, improve our understanding of the seafloor structure and sediment pathways, and demonstrate how ocean mapping resources can be useful beyond their original intent to maximize the footprint and scientific impact of a study.

Read more: https://www.usgs.gov/center-news/usgs-and-noaa-merge-collections-create-new-high-resolution-broad-scale-geologic-maps?qt-news_science_products=1#qt-news_science_products

Read the full article in GeoSciences: <https://www.mdpi.com/2076-3263/9/5/231>

This compilation of data repurposes hydrographic data, expands the area of geologic investigation, highlights the versatility of mapping data, and creates new geologic products that would not have been independently possible.

Award Winning Oregon Coastal Conservation Signage

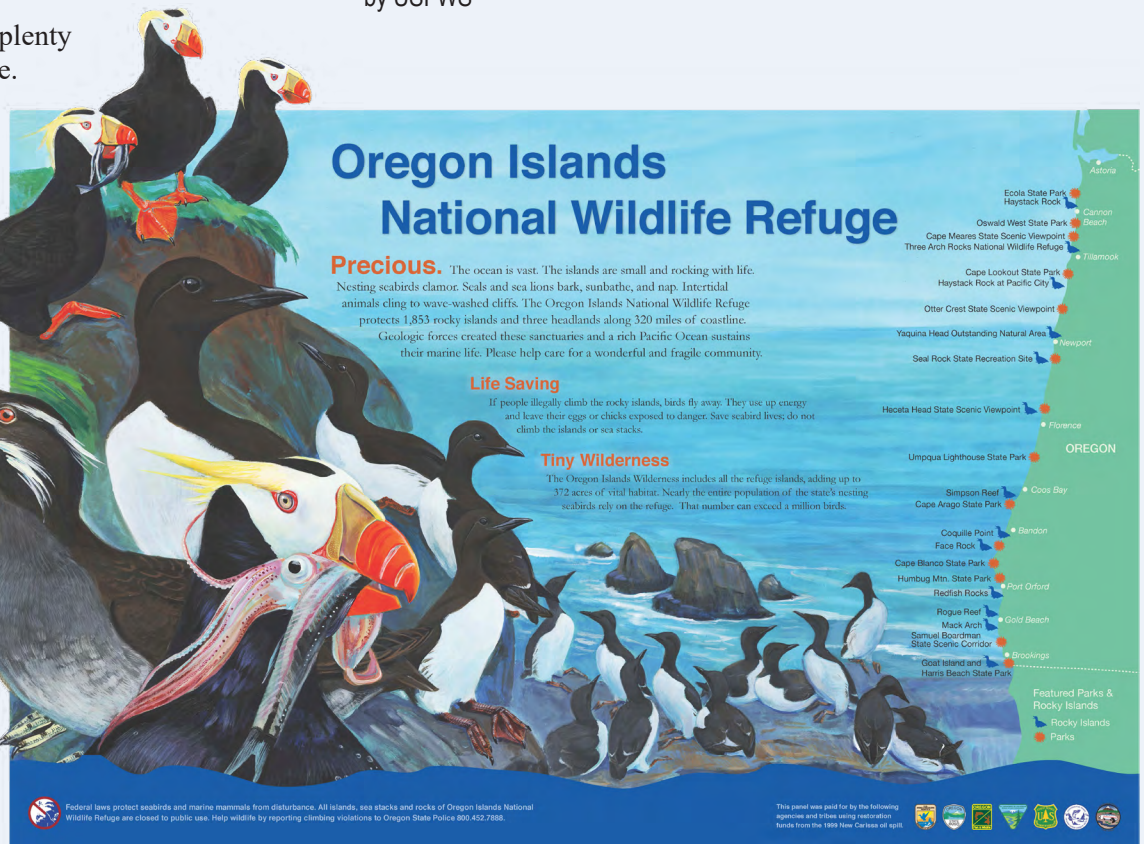
by USFWS

Along the Oregon Coast, plenty of beauty catches your eye. The ocean, rocky cliffs, beaches, offshore rocks, magnificent seabirds, seals, sea lions, and even an occasional whale sighting are all available to witness—and, now, 66 award-winning interpretive panels at 24 sites along 320 miles of Oregon coastline describe the incredible wildlife of the area.

The panels designed by Interpretive Graphics from Salt Lake City, in close coordination with Oregon State Parks and Oregon Islands NWRs, earned first place in the Outdoor Exhibits category of the National Association for Interpretation's 2019 Interpretive Media Awards. You can see them all online and download them as well.

The stunning panels came about because of a disaster. In February 1999, the 640-foot freighter *New Carissa* ran aground north of Coos Bay during a major winter storm, releasing an estimated 140,000 gallons of fuel into the marine environment.

The USFWS and five other resource trustees (Bureau of Land Management, U.S. Forest Service, Oregon Department of Fish and Wildlife, Confederated Tribes of Siletz Indians and Confederated Tribes of Coos, and Lower Umpqua and Siuslaw Indians), reached a \$28 million settlement with the ship's



Secret Kelp Forests Hide Lively Sea Life



A school of yellowtail rockfish and sea urchins in a kelp forest.



A double-crested cormorant preys on other during seabirds turning fish in the kelp.



Pacific sea nettle eating tiny fish with their tentacles but are not dangerous to people.



The clown droid (a sea slug) feeds on rhizomes—moss-like colonies of kelp that anchor kelp.



Like a Tree?
The bull kelp that washes on shore in winter is an annual seaweed that thrives in Oregon's cold, rough coastal waters. From a spore, it grows to 60 feet tall—up to 10 inches per day. A root-like "holdfast" grips the rocky bottom. Its trunk-like "stipe" ends in a hollow bulb. Leaf blades attach to the bulb and drift on the surface, capturing the sun's energy.



Look for gray whales near shore feeding in kelp beds.



A black and yellow rockfish spawns into crevices. Rockfish can live to be 300 years old.


Flash!
Sandies streak into the shadowy kelp. A cormorant shoots after them, propelled by its webbed feet. Here in the bull kelp forest of the sea, thousands of creatures flourish. Gray whales feed on mysid shrimp that dine on plankton. Jellyfish drift by. Rockfish hide. Ahead of you lies the fastest growing forest on the planet—just below the waves.

Styrofoam-free Picnic
Littered Styrofoam floats, breaks down, and persists in the marine ecosystem. Like all plastics, birds can ingest it to their detriment. Having a picnic? Bring your own plates, cups, and utensils. Keep our oceans clean—just the way kelp forests like it.

Federal laws protect seabirds and marine mammals from disturbance. All islands, sea stacks and rocks of Oregon Islands National Wildlife Refuge are closed to public use. Help wildlife by reporting climbing violations to Oregon State Police 800.452.7888.

This panel was paid for by the following agencies and views using restoration funds from the 1999 New Carissa oil spill.

Explore Trails & Views



Gregory Point

Sunset Bay State Park

Shore Acres State Park

Cape Arago Wildlife Refuge

Oregon Islands National Wildlife Refuge

Shell Island

Simpson Reef Viewpoint

Cape Arago State Park

North Cove

Middle Cove

South Cove

Explore Trails & Views

3.6 mi

2.5 mi

0 500 1,000 2,000 Feet

Respect the Reef
Simpson Reef and its islands are a protected wildlife refuge. They are closed to the public at all times so watch from afar. Seabirds are shy. Sea lions and seals are skittish. Intertidal creatures are easily crushed underfoot.

Northern Elephant Seal

*Oregon Islands National Wildlife Refuge consists of 123 islands, rocks and sea stacks and two headlands that span over 320 miles of the Oregon Coast.

This panel was paid for by restoration funds from the 1999 New Carissa oil spill.

Puffin Picnic Fresh and Fatty

Hungry!

Hungry! A Tufted Puffin offers a beak full of anchovies to its ravenous chick. In the next burrow, a fluffy puffling devours its meal of protein-packed, oily seafood. Like human kids, young seabirds need plenty of healthy food to grow strong.



Fish Delivery
Puffin parents load up their bills with 5-10 fish stacked crosswise to feed their hatchlings. From April through September, Tufted Puffins raise their young in burrows up to six-foot-long that they dig on nearby Hayslack Rock.

Seafood Chick Menu

- Double Fish**
This chick needs to have one help, so order yourself an extra fish party.
- Northern Anchovy**
When seabirds arrive close to shore, ask for extra, extra, and more!
- Rockfish Seafood**
Should we eat you and mussels? Eat a salad today for health and beauty.
- Salmon**
This is a special or expensive meal. Do you really want to eat this?

Eating Out? Be Ocean Friendly
Ask for sustainable seafood—caught or farmed in an environmentally responsible way. It's better for the ocean and for seabirds. Look up: www.seafoodwatch.org.

Forage Fish Rule the Seas
They may be tiny, but high-fat "forage fish" have a giant role in the Pacific Ocean food web. Salmon, tuna, and other commercial fish eat them. In turn, forage fish dine on zooplankton that thrive in cold, upwelling waters. When we look after the needs of forage fish, we're eating for both seabirds and people.

Federal laws protect seabirds and marine mammals from disturbance. All islands, sea stacks and rocks of Oregon Islands National Wildlife Refuge are closed to public use. Help wildlife by reporting climbing violations to Oregon State Police 800.452.7888.

This panel was paid for by the following agencies and views using restoration funds from the 1999 New Carissa oil spill.

owner and the U.S. Coast Guard for restoring species harmed by the spill.

The bulk of the money, \$19 million, went to pay for the removal of the wreck near Coos Bay, but because of the impact the oil spill had on wildlife, in particular, seabirds, a substantial amount of money was spent on coastal seabird programs and educational efforts.

“We had a project that put these interpretive panels near major seabird colonies and other places where people tend to congregate,” said Dawn Harris, visitor services manager with the USFWS, “so we could get the message out about the biology of seabirds, why they’re important, and what people can do to protect them.”

Read the Story: <https://usfwspacific.tumblr.com/post/188262197190/educational-displays-on-oregon-coast-win-national>

Find the Images: <https://www.flickr.com/photos/usfwspacific/albums/72157711278895493>

See Surfing Bison, page 32

Mid-Atlantic and Northeast Regional Ocean Partnerships—Bringing Stakeholders Together

By Darryl Francois (BOEM)

Regional Ocean Partnerships (ROPs) were recognized as the primary mechanism for ocean-planning activities under the new ocean policy, issued through Executive Order 13840 in June 2018.

The Bureau of Ocean Energy Management (BOEM) continues to be actively engaged in ocean planning efforts through its participation in the Northeast and Mid-Atlantic ROPs. The ROPs work to increase communication and collaboration among States, Federal agencies, the Fishery Management Councils, and federally recognized tribes, and to engage stakeholders. Through the ROPs, BOEM works closely with these intergovernmental colleagues to collaborate on items of mutual interest, including data sharing. Stakeholder engagement is a key component of regional ocean planning efforts.

The east coast has two ROPs:

The Northeast Regional Ocean Council (NROC), which established an Ocean Policy Committee (OPC);

The Mid-Atlantic Regional Council on the Ocean (MARCO), which established the Mid-Atlantic Committee on the Ocean (MACO).

The NROC OPC is supported by members from tribes, states, federal agencies and the Northeast Fishery Management Council, and co-chaired by New Hampshire and the U.S. Environmental Protection Agency (EPA); the National Oceanic and Atmospheric Administration (NOAA) assumed the federal co-chair role in April 2020. MACO is led by a Steering Committee chaired by a member from New Jersey, with committee members from New York, Virginia, NOAA, U.S. Army Corps of Engineers (USACE), BOEM, the Shinnecock Indian Nation, and the Mid-Atlantic Fishery Management Council.

Both regions are interested in offshore wind energy, and their respective public meetings included relevant discussion topics with presentations by BOEM and other ROP entities.

The inaugural Mid-Atlantic Ocean Forum was held in March 2019 at Monmouth University in New Jersey; links to the agenda, videos of the sessions, and presentations are posted here: <https://www.midatlanticocean.org/mid-atlantic-ocean-forum-advancing-intergovernmental-collaboration-ocean-planning/>

On February 27, 2020, MACO held a public webinar to provide an update on its work and accomplishments in ocean and coastal mapping, marine debris, non-consumptive recreation, maritime commerce and navigation safety, and ocean and coastal acidification. The webinar included a summary of stakeholders' input on regional ocean issues and ideas for the May 19, 2020 Mid-Atlantic Ocean Forum, which was originally planned to be held in New York City, but due to COVID-19 restrictions, it will be held via webinar, and stakeholders will be encouraged to provide input virtually.

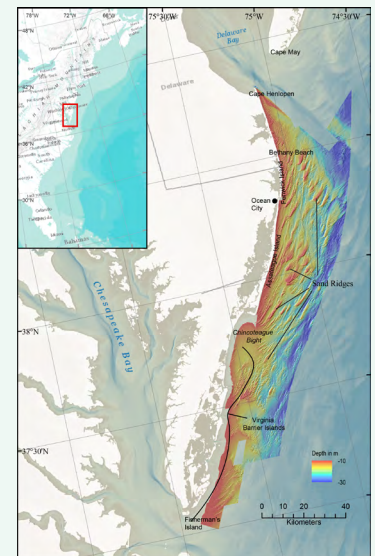
MACO is planning the Mid-Atlantic Ocean Forum for regional information sharing, collaboration, and to enhance the region's ability to leverage existing efforts and information across

See Ocean Partnerships page 21

Linking the Delmarva Peninsula's Geologic Framework to Coastal Vulnerability

The Delmarva Peninsula is a 220-kilometer-long headland, spit, and barrier island complex that was substantially affected by Hurricane Sandy. To better constrain controls on coastal vulnerability and evolution, the region's sediment sources, transport pathways, and sediment sinks must be identified. This project defines the geologic framework of the Delmarva coastal system through geophysical mapping of the inner continental shelf. Such information can then be related to the physical processes that govern coastal system evolution at storm and longer timescales. Similar efforts conducted in Fire Island, NY, North Carolina, South Carolina, and Massachusetts have proven crucial to the assessment of coastal hazards, as well as to habitat characterization and identification of cultural resources in those regions. Defining the geologic framework of the Delmarva coastal system through geophysical mapping of the inner continental shelf provides the scientific foundation for effective management of this dynamic coastal system as it responds to storms, sea-level rise, and anthropogenic activities.

Read more: https://www.usgs.gov/centers/whcmssc/science/hurricane-sandy-response-linking-delmarva-peninsulas-geologic-framework?qt-science_center_objects=0#qt-science_center_objects



Location of the Delmarva Peninsula with a hillslope shaded-relief map of the study area. Map credit: Elizabeth Pendleton, USGS

Ocean Partnerships continued from page 20

Federal and State governments, federally recognized tribes, non-governmental entities, and other stakeholders. Discussions during the forum will inform MACO and participants about potential future actions, generate a deeper understanding and awareness of member priorities and policies that may affect regional planning (e.g. funding, data, research, projects, and best practices identified in other regions), and identify areas for additional coordination

Read more: <https://www.midatlanticocean.org/mid-atlantic-ocean-forum/>

In the northeast, NROC manages its ROP activities by providing a forum for States, organizations, and Federal partners to coordinate and collaborate on regional approaches that support balanced uses and conservation of ocean and coastal resources. The NROC OPC met in June 2019 at NOAA's office in Gloucester, MA; presentations from the meeting are available on this link: <https://neoplan.org/news/presentations-from-the-june-4-nroc-ocean-planning-committee-meeting/>

The April 1, 2020 Spring NROC meeting and the April 2, 2020 NROC Ocean Planning Committee meeting were originally planned to be held in Portsmouth, NH; however, due to COVID-19 restrictions, both meetings were instead held via webinars. The NROC OPC agenda included updates and stakeholder input on the Ocean Planning Committee's projects and activities. BOEM actively participated in the discussions, which covered current offshore planning issues, including a follow-up from the June 2019 meeting that focused on offshore



Meeting participants discuss the Mid-Atlantic Ocean Data Portal and regional data priorities during the March 2019 Mid-Atlantic Ocean Forum. Photo credit: Monmouth University

wind development within the region. Meeting materials are available here: <https://neoplan.org/news/nroc-ocean-planning-committee-webinar-april-2-2020/>

NROC and MACO both rely on their respective Northeast Ocean Plan and Mid-Atlantic Regional Ocean Action Plan that were developed through extensive coordination with stakeholders, because those documents contain relevant information for ongoing regional ocean management priorities and activities.

Northeast Ocean Plan: <https://neoplan.org/plan/>

Mid Atlantic Ocean Action Plan: <https://www.boem.gov/sites/default/files/environmental-stewardship/Mid-Atlantic-Regional-Planning-Body/Mid-Atlantic-Regional-Ocean-Action-Plan.pdf>

In addition, NROC and MARCO are working together on fisheries data efforts that can be posted on the Northeast and Mid-Atlantic

Ocean Data Portals: <https://www.northeastoceandata.org/> and <https://portal.midatlanticocean.org/>, respectively. They partnered with the Responsible Offshore Development Alliance (RODA) to get input on current and potential development of maps and data products that show the use of ocean space by the commercial fishing industry. NROC, MARCO, and RODA hosted a kickoff webinar on February 3, 2020, to discuss the project, understand current data development activities from organizations in both regions, and gather input that will guide the project, which runs through September 2020.

Darryl Francios is BOEM's Renewable Energy Engineering and Technical Review Branch Chief. He serves on the steering committee of the Mid-Atlantic Committee on the Ocean (MACO) and is a member of the Northeast Regional Ocean Council and MACO.

Marine Debris is a Serious Issue

Below are excerpts of written testimony of now retired USFWS Deputy Director Jim Kurth focused on the USFWS's role in addressing the threat of marine debris to our ocean and coastal areas and its impacts on wildlife. Watch the archived webcast of the May 2019 Congressional briefing testimony online: "Marine Debris and Wildlife: Impacts, Sources, and Solutions" <https://www.epw.senate.gov/public/index.cfm/hearings?ID=39FD807A-6BBA-4E83-8E9E-5A5DFF81C66B>

Marine Debris Overview

Marine debris is one of the most pervasive and pernicious global threats to the health of the world's coastal areas, oceans, and waterways. It is an issue of growing local, regional, national, and international concern. Marine debris can injure or kill marine and coastal wildlife; damage and degrade habitats; interfere with navigational safety; cause economic loss to fishing and maritime industries, degrade the quality of life in coastal communities; and threaten human health and safety. The USFWS works collaboratively with Federal and nonfederal partners to address this growing problem and its impacts on wildlife.

Marine debris is defined as "any persistent solid material that is manufactured or processed and directly or indirectly, intentionally or unintentionally, disposed of or abandoned into the marine environment or Great Lakes" (33 U.S.C. 1951 et seq., as amended by Title VI of Public Law 112-213). Anything man-made—such as fishing gear, plastic bags, beverage bottles, balloons, food wrappers, and even vessels—can become marine debris through dumping, improper waste management, litter that is blown or washed out to sea through storm drains, and extreme natural events, which can transport both small and large items into the ocean. Major marine debris events caused by natural disasters, such as the 2011 earthquake and tsunami in Japan, and Hurricane Sandy, which hit the East Coast of the United States in 2012, have brought national and international attention to the marine debris issue. Although these singular events have focused the public's attention, people are recognizing that marine debris is a persistent, everyday problem.

Three main types of marine debris impact wildlife: plastics, derelict fishing gear, and abandoned and derelict vessels. Each is discussed briefly below.

• Plastics



Each year the USFWS, the State of Hawaii, and NOAA staff and volunteers collect tons of marine debris from the atolls and throughout Papahānaumokuākea Marine National Monument. Photo credit: NOAA



Some common forms of marine debris. Image credit: Ocean Conservancy

Plastics are one of the most extensive types of marine debris. They are commonly used in many items; as society has developed new uses for them, the variety and quantity of plastic items found in the marine environment has increased dramatically. Plastics are a very visible part of the marine debris problem, but many of the impacts of plastic on the marine environment are only now starting to be understood. Plastic and other debris such as fishing line, packing bands, balloons, rubber bands, six-pack rings, and mesh bags can lead to entanglement. Research has revealed that most commonly used plastics do not completely degrade into organic and inorganic molecules but instead break into smaller and smaller pieces called microplastics. These microplastics and their associated toxic chemical components contribute to human and wildlife health risks as the toxic microplastics are ingested and move through the marine food web. Plastics and other debris such as bottle caps, balloons, and lighters are also ingested directly by wildlife, such as sea turtles, seabirds, and marine mammals. Debris may be mistaken for food and ingested, an animal's natural food (e.g. fish eggs) may be attached to the debris, or is ingested accidentally with other food leading to loss of nutrition, internal injury, intestinal blockage, starvation, and death.

• **Derelict Fishing Gear**

A second highly visible and impactful form of marine debris is derelict fishing gear (DFG). DFG has many impacts on the environment, including damaging marine habitats, entangling marine species, creating hazards to navigation, and ghost fishing resulting in lost catch opportunities and economic losses for fishermen. Wildlife entanglement in derelict nets, ropes, line, or other fishing gear leads to injury, illness, suffocation, starvation, and death.

• **Abandoned and Derelict Vessels**

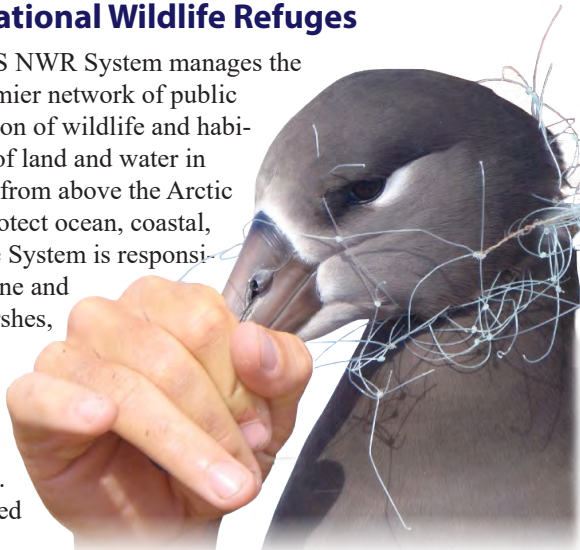
Abandoned and derelict vessels (ADV) are a third highly visible type of marine debris littering our Nation’s coastal waters. ADVs in oceans, coasts, and waterways obstruct navigational channels, cause harm to the environment, and diminish commercial and recreational activities. ADVs may pose an immediate or future threat to wildlife and wildlife habitat from the release of hazardous substances to surrounding areas. The USFWS recently removed nearly one million pounds of shipwrecks to protect some of the most pristine coral reefs in the world at the Palmyra Atoll and Kingman Reef NWRs. The iron from the shipwrecks on these remote atolls was fueling the growth of invasive organisms that smothered a large amount of once-healthy, diverse coral. By removing these ADVs, the healthy reefs will be able to recover from this damage.



A sea turtle trapped by abandoned fishing net. Photo credit: NOAA

Marine Debris Challenges at National Wildlife Refuges

The USFWS NWR System manages the world’s premier network of public lands devoted solely to the conservation of wildlife and habitat. There are over 500 million acres of land and water in the Refuge System with 180 refuges, from above the Arctic Circle to south of the Equator, that protect ocean, coastal, and Great Lakes habitats. The Refuge System is responsible for an incredible diversity of marine and coastal ecosystems including salt marshes, rocky shorelines, tide pools, sandy beaches, kelp forests, mangroves, seagrass meadows, barrier islands, estuaries, lagoons, tidal creeks, tropical coral atolls, as well as open ocean. Each of them are increasingly impacted by marine debris.



Black footed albatross entangled in plastic. USFWS



Thousands of pounds of marine debris collect on the shores of Midway Atoll as well as on other remote shores every year. Continual cleanup requires significant management and staff in these remote areas. Photo by Holly Richards, USFWS

The Interagency Marine Debris Coordinating Committee (IMDCC)

Despite the scope of the problem, marine debris is preventable through increased public awareness, changing individuals’ behaviors, and improvements to waste infrastructure. Marine debris can be addressed by ensuring a comprehensive approach that is local in scale and global in scope, directed primarily at source prevention and education.

The IMDCC is a multi-agency group tasked with ensuring this comprehensive approach is implemented. It was established by Congress under the Marine Plastic Pollution Research and Control Act of 1987 and was re-established under the Marine Debris Act (33 U.S.C. 1956).

The IMDCC consists of a variety of Federal agencies:

NOAA, the EPA, the Department of Defense (DOD), the USACE, the U.S. Navy, the Department of Homeland Security, the U.S. Coast Guard, the Department of State, the Department of Justice (DOJ), the DOI (USFWS, BSEE, and NPS), and the Marine Mammal Commission.

Fish Slam!

Bringing Experts Together to Monitor Non-Native Fish Populations

By Kaitlin Kovacs, Pamela Schofield, and Mary Brown (USGS)

In South Florida, a scientific scavenger hunt for non-native freshwater fishes led by USGS scientists helps monitor new introductions and document range expansions of non-native fishes.

South Florida is no stranger to non-native and invasive species. Although Burmese pythons (*Python bivittatus*) and Argentinean tegus get much of the attention, freshwater fishes like the Mayan cichlid (*Cichlasoma urophthalma*) and Oscar (*Astronotus ocellatus*) have also become major problems in the region. Dozens of species of non-native fishes are present in the freshwaters of Florida, and new species are discovered each year. Once a breeding population is established, non-native fishes can reduce native



A bounty of non-native fishes collected from South Florida freshwater bodies. Photo credit: Kaitlin Kovacs, USGS

fish populations by out-competing or preying on them. The extensive canal system in South Florida serves as a conduit for these problematic fish species, potentially granting them access to biologically sensitive areas, like the Everglades.

Bring in the Fish Slam

The bio-blitz-like Fish Slam event involves bringing fish experts from around the State together to sample freshwater bodies in areas of interest, like Big Cypress National Preserve. Using a variety of techniques, including hook and line, cast nets, minnow traps, and electrofishing, the teams collect fish species not native to the area. Read more: <https://www.usgs.gov/news/usgs-and-partners-team-track-down-nonnative-and-invasive-fishes-south-florida>

In November 2018, the Fish Slam visited 22 freshwater sites in Palm Beach, Broward, and Miami-Dade counties. Thirty-two fishery biologists from 12 agencies and academic

institutions collected or observed 23 species of non-native fishes, including Asian swamp eel and bullseye snakehead. Although no new non-native species or range expansions were detected, a large common carp (*Cyprinus carpio*) was collected. This species is widespread throughout most of the United States but rare in the waters of South Florida. Read more: https://www.usgs.gov/centers/wetland-and-aquatic-research-center-war-c/science/fish-slam-november-2018?qt-science_center_objects=0#qt-science_center_objects

In 2019, Fish Slam targeted Indian River and St. Lucie counties in March and Seminole and Orange counties in June. The March event collected two species of platyfish (*Xiphophorus* spp.), which have not been recorded in the area since the 1970s. In June,



USGS researcher Pam Schofield checks non-native fish caught by NPS Invasive Species Program Manager Bryan Falk. Photo credit: Kaitlin Kovacs, USGS



Common carp caught during Fish Slam 2018. Photo credit: Kaitlin Kovacs, USGS

Florida Non-Native Fish Action Alliance

In 2012, the USGS and the Florida Fish and Wildlife Conservation Commission recognized the difficulty for a single organization or agency to keep track of new introductions and the spread of non-natives, so they formed the Florida Non-Native Fish Action Alliance.

The alliance brings together Federal and State agencies, universities, Native American tribes, and nongovernmental organizations to address the non-native fish problem in Florida. Maintaining current information on the geographic ranges of all non-native fishes is a daunting task. Coordinating sampling, research, and management across multiple jurisdictions is necessary, as is providing up-to-date geographic distribution information to publicly accessible databases. Together, the Alliance partners are tackling the enormous task of documenting and managing non-native fishes in Florida.

Objectives of the alliance include:

- Sample water bodies (such as ponds and canals) not normally sampled to document the non-native fishes, look for new species, or changes in distributions.
- Address unconfirmed reports of the introduction of a new non-native species.
- Conduct research on best eradication techniques, if feasible, to have minimal impact on native fauna.
- Conduct surveys and provide up-to-date distribution information to natural-resource managers.
- Provide distribution information to the USGS Nonindigenous Aquatic Species database (NAS).
- Provide specimens to the natural history museum, which serves as “libraries of fishes” for study by academics in perpetuity. Make fishes data collections publicly available online.
- Provide specimens to academic researchers.
- Coordinate with and update the Everglades Cooperative Invasive Species Management Area committee.

Learn more: https://www.usgs.gov/centers/wetland-and-aquatic-research-center-warc/science/florida-non-native-fish-action-alliance?qt-science_center_objects=0#qt-science_center_objects

African jewelfish (*Hemichromis letourneuxi*) were collected, which represents the northernmost collection of the species in Florida. Read more: https://www.usgs.gov/centers/wetland-and-aquatic-research-center-warc/science/treasure-coast-and-central-florida-fish?qt-science_center_objects=0#qt-science_center_objects

Data for all non-native fish species captured and observed during Fish Slam were submitted to the USGS Nonindigenous Aquatic Species database. This database tracks sightings on non-native aquatic plants and animals through the United States and is publicly available: <https://nas.er.usgs.gov/>

What started as a small-scale, single-day fish survey in and around Loxahatchee NWR is now an expansive effort targeting multiple areas throughout South Florida. The USGS-led Fish Slam is now a two-day event that occurs a few times throughout the year, and the list of participating organizations grows each year.



Rob Robins (Florida Museum), Dr. Jon Moore (FAU/Yale Peabody), and Dr. Eric Hilton (VIMS) preparing specimens collected during Fish Slam 2018. Photo credit: Kaitlin Kovacs, USGS

What Do You Know About the Black-Capped Petrel?

The black-capped petrel (*Pterodroma hasitata*) is a rare species among a suite of Atlantic seabirds that have impressive movement patterns—often traversing across multiple political boundaries and ecological areas in less than a week. The petrels travel from nesting areas in the Caribbean up and across the western North Atlantic as they forage in the eddies, currents, and gyres of the open ocean environment. But based on the remote areas and great distances these rare birds travel, there are extensive data gaps that prevent good understanding of what these birds are doing and where. Evidence indicates that their numbers are threatened, like many other shore and seabird species.

“These seabirds spend most of their lives at sea, flying over the open ocean in search of food,” says Patrick Jodice, South Carolina Cooperative Fish and Wildlife Research Unit of the USGS. “These tags will tell us which parts of the ocean these birds use, which in turn will help us understand the threats they face while at sea. We hope that the petrels might lead us to undiscovered nesting sites on new islands.”

A team of researchers including the American Bird Conservancy, USGS South Carolina Cooperative Fish and Wildlife Research Unit, the New Zealand Seabird Trust, and other partners successfully captured and 10 black-capped petrels at sea offshore North Carolina, tagging them with small transmitters that will temporarily help the scientists track these birds. The hope that is that they will help locate new nesting colonies for this rare species, where more extensive research can be done. By late September 2019, most tags ceased transmissions. The lifespan of these tags is challenging to predict—for example, the sutures



A black-capped petrel at sea. Photo credit: USFWS

that hold the tags in place can eventually wear out or the solar panels that charge the tags can become obscured by feathers. Researchers at the USGS summarized and analyzed the tracking data, and Jodice reported on the “First successful capture and satellite tagging of Blackcapped Petrels at sea and subsequent movement patterns” at the 43rd Annual Meeting of the Waterbird Society in Princess Anne, MD, in November 2019.

Read about how to catch a bird at sea: <https://abcbirds.org/article/historic-first-for-mysterious-seabird-achieved-with-net-launcher-perseverance-and-chum/>

Learn more about the black-capped petrel: <https://www.fws.gov/southeast/wildlife/birds/black-capped-petrel/>



Conservation partners and volunteers gather to prepare for wild rice seeding on Lower Green Bay on November 5, 2019. Tribal members of the Mole Lake Band of Lake Superior Chippewa harvested some of the rice seed and participated in the seeding effort. Photo credit: UW–Green Bay

Great Lakes Habitat Improvement

The Annual 2019 Green Bay RiceFest!

By Amy Carrozzino-Lyon (UW–Green Bay)

Multiple partners and community members came together in November 2019 to reseed wild rice on the west shore of Green Bay, Lake Michigan. The restoration project started in 2017, focusing on seven priority coastal wetlands in Green Bay.

The USFWS Coastal Program biologists, with the help of many partners, volunteers, and children, work to reseed wild rice, a native emergent wetland plant that creates important fish and wildlife habitat and provides an important food source for wildlife. Wild rice also holds important cultural value for Native American tribes in the region.

It’s a very simple planting process—participants take a handful of the seed and throw it into the air—letting the wind take it up, break it apart a bit, ideally settling in areas with shallow water depths and soft sediment! These new seeds will start growing in spring 2020 as days get longer and waters warm. University of Wisconsin (UW)–Green Bay will continue to monitor the seeding sites to gauge success and inform future management.

Some quick numbers from the November 2019 RiceFest:

- 65 people (20 middle school students)
- 48 bags of wild rice (2,000+ lbs, or >1 ton)
- 40 acres of wetlands
- 7 sites on the Green Bay west shore
- 5 days of wild rice seeding
- 3 ice breaking days
- 2 transport trips to pick up rice seed from harvesters
- 1 site seeded by canoe (Sensiba Wildlife Area)

South Bay San Francisco Conservation Champion

By Meagan Racey (USFWS)

This story was adapted from “South Bay Icon” https://www.fws.gov/cno/newsroom/featured/2019/south_bay_icon/

Florence LaRiviere is an environmental advocate who was shy but says, “if you get fussed enough, you will stand up and say something.”

LaRiviere and her husband spent half a century ensuring future generations could play in the pickleweed at the end of the road. That—and more. Indeed, in extension of their efforts, most of the bay south of the San Mateo Bridge is in public ownership. At the center of that labor of love, still today, is LaRiviere.

“I will tell you there is nothing so lovely, no place so charming, as the marsh in the evening. The tide changes and moves the cordgrass. It bends back and forth...the only sound—it can be very quiet—is the birds jumping into the air and crying as they fly,” said Florence LaRiviere, who is now 95.

From their treasured picnicking spot along the edge of San Francisco Bay in 1951, the LaRivieres noticed that the city was “scooping out a bucket of mud from the bottom of the bay, swinging the arm around and dropping all that mud on live, beautiful tidal marsh” to maintain the harbor, she said. “And we knew something was wrong there. That was the beginning of a long, long journey that persists to this day.”

In 1965, she read the local newspaper, *The Mercury News*. In it was an invitation, she recalled, “If you’re worried about what’s happening to the shores of the San Francisco Bay, come to my office in the morning at 10 o’clock.” She, and a couple dozen others, showed up at the office of Santa Clara County Planner Art Ogilvie. He wanted Congress to establish a national wildlife refuge in the bay. “Then we will have the Federal Government to preserve our precious wildlife and our marshes,” said LaRiviere, quoting Ogilvie.



Florence and daughter Ginny display one of the original Safeway bags from the 1980s “Save the Bay” campaign that Florence and her team of organizers began. Credit: Jon Myatt, USFWS

From there grew a grassroots committee that met with garden clubs, environmental groups, agencies, women’s clubs, and fraternal clubs with San Jose State University professors speaking about the value of the marshes to the surrounding communities. Their success, according to LaRiviere, would rely on knowledge and attitude. It worked. Three years later, the committee approached U.S. Representative Don Edwards with the request to establish the national wildlife refuge. In 1972, his bill passed and was signed by President Richard Nixon. The San Francisco National Wildlife Refuge, later renamed to honor the Congressman, would stretch 180,000 acres from Dumbarton Bridge south to Alviso.

“With the kind of government we have, you can be effective,” LaRiviere said.

In 1985, when Florence LaRiviere discovered that wetlands species were still being lost in South Bay, she formed a new organization at her kitchen table, the Citizens Committee to Complete the Refuge. The all-volunteer organization meets monthly to this day. Their near-term goal was to expand the refuge boundary, but they remain in pursuit of restoring and protecting every open acre of bay shoreline and salt pond.



Sitting at the table where it all began in her Palo Alto home, 95-year-old Florence LaRiviere recalls her memories of conserving San Francisco Bay marshlands in the 1960s. It was this kitchen table, where she read *The Mercury News*. Credit: Jon Myatt, USFWS

Protecting Palau: World's First Conservation Pledge

Palau is in the western Pacific Ocean, 800 miles southwest of Guam, in a region known as Oceania. The island country is a U.S. freely associated state and includes about 340 islands and together, with parts of the Federated States of Micronesia, forms the western chain of the Caroline Islands, sharing maritime boundaries with the Philippines, Indonesia, and Micronesia.

Palau's economy is based mainly on tourism, subsistence agriculture, and fishing, with a substantial part of the gross national product (GNP) derived from foreign aid. Being so dependent on tourism and healthy sustainable natural resources, in 2017, Palau became the first country to update its immigration policy and landing procedures to implement legislation with the goal of preserving Palau's culture and natural resources for future generations.

All travelers entering the country watch an in-flight movie, called "The Giant," and are then required to sign the Palau Pledge, the first mandatory eco-pledge of its kind.



A screen grab from the award-winning short film, "The Giant," used to show how the children of Palau value environmentally conscious visitors. Watch the film and learn more: <https://palaupledge.com/> Image credit: Host/Havas

The Palau Pledge is stamped in passports with visitors signing a declaration to protect Palau's environment and culture for the next generation; the promise is made directly to the children of Palau to preserve this country, their home. The Palau Pledge film created out of Host/Havas, "The Giant," won three Grand Prix on the final night of the Cannes Lions International Festival of Creativity. First Lady Debbie Remengesau received the Crans Montana Forum's 2018 Prix de la Fondation Award, for her leadership in conservation. Read more: https://www.pristineparadisepalau.com/wp-content/uploads/2017/12/press-release-re-first-lady-receives-the-prix-de-fondation-2018-award_15apr2018_final.pdf

Along with other Pacific Islands, Palau was made a part of the United States-governed Trust Territory of the Pacific Islands in 1947. In 1979, Palau voted against joining the Federated States of Micronesia, and gained full sovereignty in 1994 under a Compact of Free Association with the United States. Today, Palau is a presidential republic in free association with the United States.

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14 years (November 2005) since the group met in the remote island country.

The Honorable Tommy E. Remengesau Jr., President of the Republic of Palau welcomed the meeting attendees and the Task Force co-chairs Douglas Domenech, DOI–Assistant Secretary for Insular and International Affairs and RDML Timothy Gallaudet, DOC–Assistant Secretary of Commerce for Oceans and Atmosphere.

Over the course of the meeting President Remengesau, Domenech and Gallaudet met with other Task Force members, Federal, State, and nongovernmental organization leadership to discuss priorities, concerns and challenges for maintaining the economic driver of tourism while also sustainably managing effective coral reef and fishery resources across the U.S. jurisdictions.

During the meeting, the USCRTF members welcomed the FEMA as the newest Federal agency USCRTF member, recognizing the value corals bring to coastal island communities by reducing coastal hazards and associated impacts to population, infrastructure, and ecosystems. FEMA joins other Federal USCRTF members: DOI, NOAA, EPA, National Aeronautics and Space Administration, U.S. Department of Agriculture, DOD, DOJ, U.S. Department of State, U.S. Department of Transportation, National Science Foundation, U.S. Agency for International Development, as well as State and territorial members American Samoa, Commonwealth of the Northern Mariana Islands, Florida, Guam, Hawaii, Puerto Rico, and USVI, and the three Freely Associated States of Palau, Marshall Islands, and Federated States of Micronesia.

Joanna Walczak (Florida Department of Environmental Protection) and Yimnag Golbuu (Palau International

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Coral Reef Center) provided the U.S. All Islands Coral Reef Committee Chair's Report. Liza Johnson (DOI) and Jennifer Koss (NOAA) presented the USCRTF Steering Committee update. Experts and other team members shared information and updates for the USCRTF members on a wide range of topics including:

- Stony coral tissue loss disease in Florida and the Caribbean
- Coral bleaching
- Ballast water and coral disease
- Coral mitigation banking in Hawaii
- Restoring Resilient Reefs Act of 2019
- The Micronesia Challenge: An Innovative Commitment for Conservation
- Coral Reef Fisheries and Management
- Coral reef hazards risk reduction; USGS report
- Caribbean Coral Reef Partnership



The DOI team attending the meeting in Palau included: (top row, left to right) Guy Gelfenbaum and Curt Storlazzi (USGS); and (bottom row-left to right) Anna Toline (NPS), Doug Domenech (DOI), Ann Tihansky (USGS/DOI), Liza Johnson (DOI), and Jim Reilly (USGS). Photo credit: DOI



Large colonies of lettuce coral (*Agaricia* sp.); one of the largest colonies on Earth is in Ulong Channel in Palau. Photo credit: Mark Eakin, NOAA

As the meeting host, Palau showcased their world class coral reefs and other natural and cultural treasures with the visiting USCRTF members through a range of site visits. Palau representatives took USCRTF members to visit island watersheds, archaeological and historic sites, iconic rock island ecosystems, fishing communities, coral reefs, and areas of high tourism where new management techniques are being evaluated for whether they effectively reduce impacts to natural resources.

Palau representatives shared information about specific programs being implemented in country:

- “Enhancing State Capacity to Improve Planning” by Mary Frances Remengesau, Governor of Ngaremlengui State, Palau
- “Protected Areas as a Strategy to Protect Biodiversity and Improve Livelihoods: Palau’s Protected Areas Network and National Marine Sanctuary” by F. Umiich Sengebau, Palau Ministry of Natural Resources, Environment and Tourism; and Elbuchel Sadang Palau Ministry of Finance
- “Enhancing Geographic Information Systems (GIS) Capabilities in the Republic of Palau” by Peter Peshut, Palau Environmental Quality Protection Board
- “The Role of NGOs in Supporting Sustainable Land Management” by

Bola Majekobaje, Palau Conservation Society

Palau education, culture, and outreach were common underlying themes throughout the meeting. In addition to traditional dance performances, tours of traditional sailing vessels, and visits with fishing villages, the Palau Ministry of Education shared information on the Palau science curriculum and the Palau Community College Environmental/Marine Science Program and included a visit to the innovative outdoor classroom Ebiil Skill Building camp with Ann Singeo and staff of the Ebiil Society.

As part of the public Business Meeting, held on September 12, 2019, at the Ngarachamayong Cultural Center, in Koror, USGS Director Jim Reilly presented, “Understanding Our Coral Reefs: USGS Science Today and Tomorrow,” which highlighted the diverse work that USGS brings to coral science and marine coastal communities ranging from assessing coastal hazard risk reduction provided by coral reef structure to understanding watershed changes, invasive species, disease, and other related ecosystem impacts.

The full business meeting agenda is available at: https://www.coralreef.gov/meeting42/pdfs/uscrtf_business_meeting_agenda_42nd.pdf

Learn more: <https://www.coralreef.gov/meeting42/>

The Spring meeting in DC was cancelled due to the coronavirus; but USCRTF members and Working Groups continue working through online meetings.



The iconic rock island landscape of Palau. Photo credit: Anna Toline, NPS.

Coral Reef Management Fellows



National Coral Reef Management Fellowship Program 2018–20

The National Coral Reef Management Fellowship Program is a partnership between Nova Southeastern University's National Coral Reef Institute, NOAA's Coral Reef Conservation Program, the DOI Office of Insular Affairs, and the U.S. All Islands Coral Reef Committee.

The program recruits Coral Reef Management Fellows for the seven U.S. coral reef jurisdictions (American Samoa, the Commonwealth of the Northern Mariana Islands, Florida, Guam, Hawaii, Puerto Rico, and the USVI) to address current capacity gaps and to build longer-term capacity in these locations. This is done by placing highly qualified individuals whose education and work experience meet each jurisdiction's specific coral reef management needs. The program's goal is to develop a thriving collaborative fellowship program that builds excellent next-generation leaders and capacity for effective local coral reef ecosystem management.

Learn more: <https://cnso.nova.edu/fellows/index.html>



Coral Management Fellows 2016-2018, at fellowship training in Kona, Hawai'i. From left: Kelly Montenero (Florida), Malcolm Johnson (CNMI), Whitney Hoot (Guam), Hilary Lohmann (USVI), Mariana Leon Perez (Puerto Rico), and Sabrina Woofter (American Samoa). Photo credit: Kevin Doyle.

Monitoring HABs in New York Lakes

USGS Supports State's Initiative to Combat Potentially Toxic Blooms

By Jessica Fitzpatrick and Guy Foster (USGS)

USGS scientists, with support from the New York State Department of Environmental Conservation (DEC), installed technologically advanced monitoring systems to study water-quality conditions and harmful algal blooms (HABs) in Owasco, Seneca, and Skaneateles Lakes in New York. The three selected Finger Lakes were recently affected by HABs and represent a range of nutrient and water-quality conditions. The New York State's DEC has a website that lists the location and duration of HABs reported at any given time in New York.

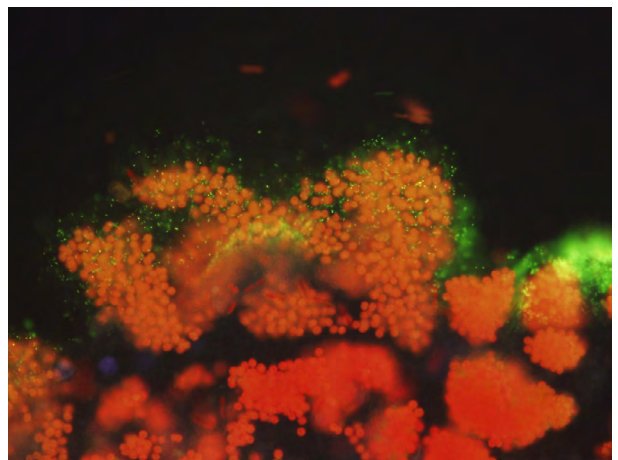
This monitoring effort will provide a better understanding of HAB growth and severity and allow for near-instantaneous detection of changing water-quality conditions that might be indicative of HAB development. This will enable State officials, water-resource managers, drinking-water utilities, the public, and others to make more informed decisions on how to deal with HABs and to develop mitigation strategies.

Guy Foster, USGS New York HAB project lead said, "USGS research capabilities are being deployed to figure out the environmental conditions and processes that result in the formation of

HABs, their growth and severity. In addition, new monitoring techniques are providing near instantaneous detection of when the public could be exposed to a potentially harmful algal bloom." This collaborative effort, funded by the DEC and the USGS, supports the State's \$65 million



USGS advanced monitoring platform on Owasco Lake in New York. This is part of an effort to study water-quality conditions and HABs in Owasco, Seneca, and Skaneateles Lakes in New York. This collaborative effort, funded by the New York State Department of Environmental Conservation and the USGS, is in support of the State's \$65 million initiative to aggressively combat HABs in waterbodies across New York. Photo credit: Elizabeth Nystrom, USGS



Microscopic image of the potentially toxic cyanobacteria, *Microcystis aeruginosa*. This is one type of toxin that can potentially lead to HABs. Photo credit: Barry Rosen, USGS

Learn About HABs and Algal Toxins

Algal toxins are natural toxins that have reported hazards associated with exposure. Every year, access to water for recreation and drinking is limited or prohibited because of HABs. For example, the discovery in 2014 that the city of Toledo, OH, water supply was contaminated by algal toxins resulted in a “do not drink advisory” for nearly three days and drew national attention to the potential vulnerabilities of our water resources to toxins. Likewise, Florida State of Emergency declarations were made in 2016 and 2018 because of HABs in Lake Okeechobee waterway, and “red tides” (dinoflagellate [*Pyrrophyta* spp.] blooms) in the Gulf of Mexico along Florida’s Gulf Coast resulted in beach closings.

The actual risks to humans, pets, livestock, and wildlife from sublethal doses of cyanotoxins associated with HAB exposure are not currently well understood.

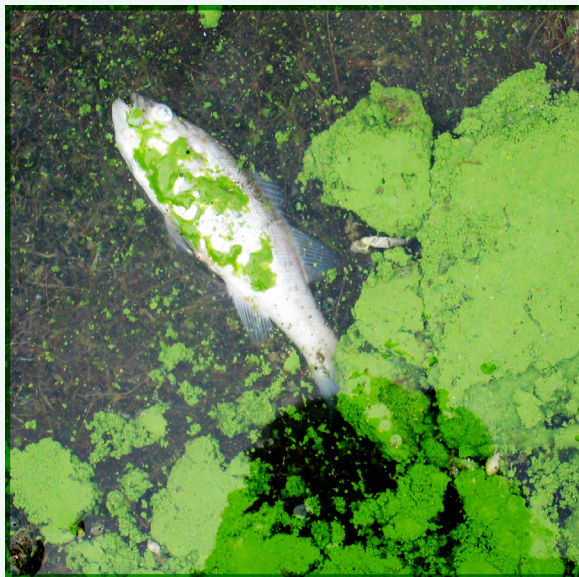
Consequently, resource managers and public health officials apply precautionary approaches and limit access to water resources when HABs are present, even in the absence of toxin occurrence or quantifiable health risk. Limiting access can result in economic challenges.

Read the special issue of the GeoHEALTH-USGS newsletter focused on HABs: https://www2.usgs.gov/envirohealth/geohealth/pdfs/geohealth_vol15_no3.pdf?fbclid=IwAR1SeSrXpKolzit_-_iFzBzs8Bm8tdRiEuKoNeTzIK8p5ZoXszRqhRmkKPs

Learn about USGS HAB science capabilities: <https://pubs.er.usgs.gov/publication/ofr20161174>

USGS HAB science team: https://www.usgs.gov/mission-areas/environmental-health/science/toxins-and-harmful-algal-blooms-science-team?fbclid=IwAR3OaqT6DzZrwG0wkAqDYMydWlmRPIS_A1kFDLFr2ALPs8Dq-jf3jBrsSKs&qt-science_center_objects=0#qt-science_center_objects

New York State’s DEC HABs notifications page: <https://www.dec.ny.gov/chemical/83310.html>



HABs and their toxins can kill wildlife and also pose health risks for humans. Photo credit: Jennifer Graham, USGS

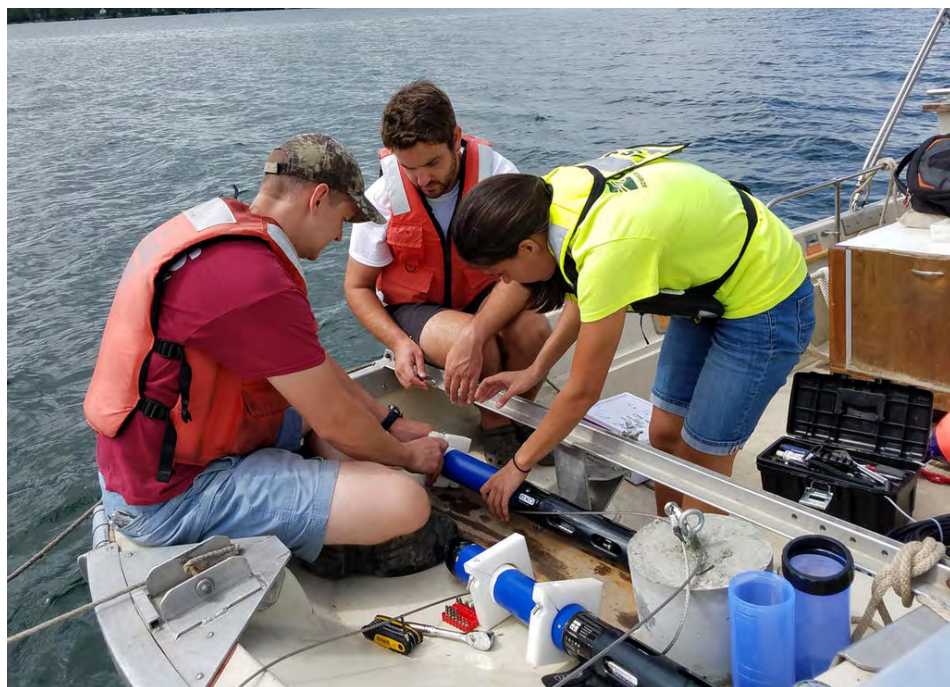
Monitoring HABs continued from page 30

initiative to aggressively combat HABs in waterbodies across New York.”

This work grows from more than a decade of USGS science on HABs, bringing together scientists from many different disciplines in its HAB research efforts across the Nation.

Read more: https://www.usgs.gov/news/usgs-kicks-innovative-project-study-harmful-algal-blooms-new-york?fbclid=IwAR0H_Jpe2tBnJaohBvkzFI29K_GC6OII86UvBRLdeXZ3_tEBylAtNwZ96OY

View data from the USGS water-quality monitoring sites in New York: <https://ny.water.usgs.gov/maps/habs/>



USGS scientists prepare a water-quality monitor for deployment on Owasco Lake in New York. Photo credit: Elizabeth Nystrom, USGS

The Surfing Bison



Award-Winning Oregon Coastal Conservation Signage

See Special Feature on page 18

Read the Story: <https://usfwspacific.tumblr.com/post/188262197190/educational-displays-on-oregon-coast-win-national>

Find the Images: <https://www.flickr.com/photos/usfwspacific/albums/72157711278895493>



White-Winged Scoter
grinds up mussel shells with its powerful gizzard.

Harlequin Duck is named for a pantomime jester in a colorful outfit of triangles and diamonds with a black half mask.

Tidepool Sculpin

camouflage. My blotchy patterns help me hide from my predators: greenling (fish) and Pigeon Guillemots (birds). When the tide goes out, I swim back to my own little tidepool every time.
Be Still. Look long. Be quiet. Then, you might spot me.

Giant Green Anemone

Partners! That green color is from the algae living inside me. I give the algae a place to live and the algae gives me oxygen and sugar. I eat seafood, too, and can grow bigger than your hand and live for 100 years.
Be Tender. Touch my sticky tentacles with care. Never poke me.

Tidal Rhythms

Sea lions vie for favorite nap and sunning spots. When the tide is out, they pack onto the beaches and reefs. When the tide is in, they bob in the water, lining up for the few coveted patches. Sound familiar? Where do you like to put your towel on a busy beach?

"We've got first dibs on the back of Shell Island."
—Northern Elephant Seal

"Great place to hang with the boys."
—California Sea Lion

"If you like sushi, try Simpson's Reef."
—Steller Sea Lion

"We give the reef a flipper's up for raising our pups every summer."
—Harbor Seal

Five-Star Hotel

Deluxe. A secluded location, luxury napping spots, and delectable seafood make Simpson Reef wildly popular for seals and sea lions. Come back often to see who has checked in and out. Like all fine hotels, guests can be exotic and unexpected, from Harlequin Ducks to gray whales and even an orca.



Share the Shore

Seals and sea lions come on land to rest, to regulate body temperatures, and for mothers to nurse their young. Respect their need for solitude. Watch only from the viewing platform.

Kam Hyeon



Federal laws protect seabirds and marine mammals from disturbance. All islands, sea stacks and rocks of Oregon Islands National Wildlife Refuge are closed to public use. Help wildlife by reporting climbing violations to Oregon State Police 800.452.7888.

This panel was paid for by the following agencies and tribes using restoration funds from the 1999 New Carissa oil spill.

