



# NEWSWAVE

Selected news stories from across the U.S. Department of the Interior's Ocean, Great Lakes and Coasts

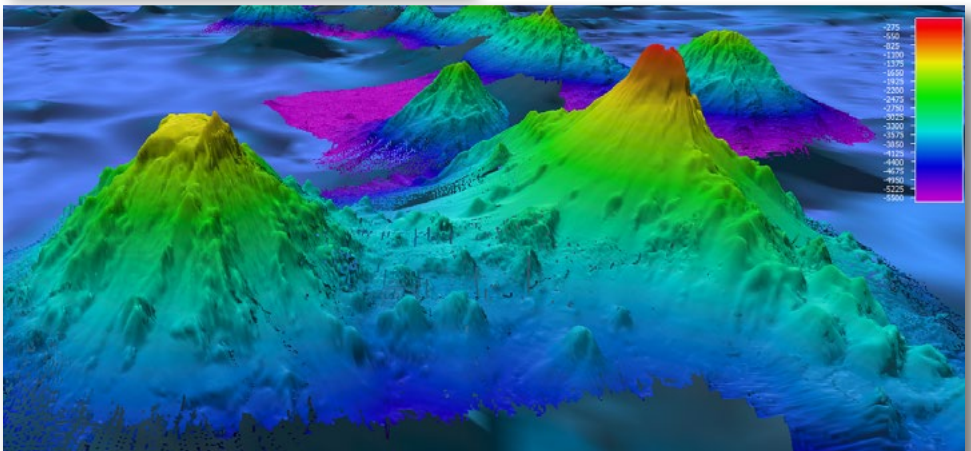
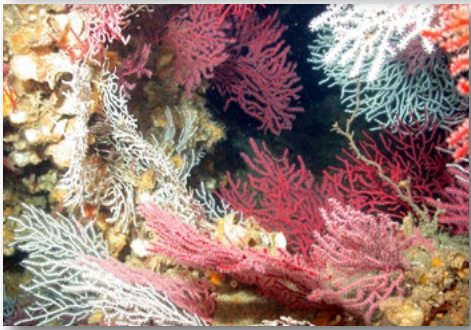
Summer 2023

## Ocean Climate Connections Across Our Blue Portfolio



The Department of the Interior's Blue Portfolio extends from inland watersheds to coastal areas nationwide, from the continental shelves to the deepest parts of the ocean floor.

The resources in our rivers, bays, coasts, Great Lakes and ocean provide tremendous economic, recreational, cultural, and biological value to our country and support many diverse ways of life.



Read **NEWSWAVE**: [www.doi.gov/ocean/newswave](http://www.doi.gov/ocean/newswave)

Visit us online: [www.doi.gov/ocean](http://www.doi.gov/ocean)



Coastal artwork: Crabitat, 1987 (579 of 1000), by Charley Harper (1922–2007), is a numbered edition serigraph that is part of more than 140 works by the artist in the U.S. Department of the Interior (DOI) Museum's collection (OSAC 00216).

**Cover photos:** Clockwise from top left: Offshore wind is an important part DOI's offshore energy portfolio on the Outer Continental Shelf (OCS). Photo credit: Bureau of Ocean Energy Management (BOEM). Secretary Haaland welcomed the White House 2023 Conservation Summit to the Main Interior Building in Washington, DC in March 2023 where key actions, including an Ocean Climate Action Plan, were announced. Photo credit: DOI. Deep sea corals are part of vast and complex ecosystems on the ocean floor that are foundational to Gulf of Mexico food webs. Photo credit: National Undersea Research Center at the University of North Carolina, Wilmington. Multibeam bathymetry of Pacific Ocean's Pao Pao Seamount (right) and an unnamed guyot (left). Image credit: National Oceanographic and Atmospheric Administration (NOAA).

#### Contribute to **NEWSWAVE!**

If you have any questions, comments or want to receive **NEWSWAVE** by email, contact: Ann Tihansky: [tihansky@usgs.gov](mailto:tihansky@usgs.gov)

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In February, Secretary Haaland was invited to New Zealand by the Minister of Foreign Affairs Nanaia Mahuta. The trip included a visit to New Zealand's innovative national museum, Te Papa. The U.S. and New Zealand work together to obtain Māori cultural items and ancestors that have been stolen throughout history from many Indigenous communities and ensure they are returned to the communities where they belong. Photo credit: DOI.

Read more: <https://www.doi.gov/pressreleases/enduring-international-collaboration-focus-secretary-haaland-new-zealand-visit>

### \$125 Million to Restore Nation's Lands and Waters

Funding provided through the Bipartisan Infrastructure Law will advance DOI's restoration and resilience framework. "At a time when tackling the climate and biodiversity crises could not be more critical, these investments in clean water, clean air, wildlife habitat, cultural resources and open spaces will benefit people, wildlife and local economies for generations to come," said Secretary Deb Haaland.

Learn more: <https://www.doi.gov/pressreleases/secretary-haaland-announces-125-million-restore-nations-lands-and-waters-part>



Four Tufted Puffins (*Fratercula cirrhata*) on the water near their breeding colony at Gull Island, AK. Photo credit: Sarah Schoen, USGS.



Top left: Assistant Secretary for Insular and International Affairs Carmen G. Cantor is presented with a woven basket by Keola Awong, NPS Chief of Interpretation and Education at Pu'uhonua o Honaunau National Historical Park in Kona, HI. At right: She inspects two ki'i, guardians of the place of refuge. Photo credits: Ann Tihansky, USGS Above: Assistant Secretary Cantor visited the Panamanian Parque Natural Metropolitano, where technical experts from the Department collaborated with Panamanian park and non-governmental organization staff to design and install a solar panel system. This renewable energy network not only reduces the park's energy consumption and greenhouse gas footprint, but also serves as a renewable energy demonstration site.

## Recognizing Global Ocean Connections

Assistant Secretary for Insular and International Affairs Carmen G. Cantor joined the U.S. delegation at the Our Ocean Conference in Panama City, Panama, to highlight the Department of the Interior's role in conserving our ocean, Great Lakes, and coasts.

"The Department of the Interior is committed to conserving and restoring the health and productivity of the ocean for the benefit of all Americans. Under our 'Blue Portfolio' we manage more ocean and coastal resources than any other agency, including 2.3 billion submarine acres on the Outer Continental Shelf (OCS), 183 coastal and ocean National Wildlife Refuges, and 35,000 miles of coastline," said Assistant Secretary Cantor. "We are investing in collaborative, science-driven conservation that is advancing coastal climate resilience and jumpstarting the offshore wind industry to advance America's clean energy economy."

Read more: <https://www.doi.gov/pressreleases/assistant-secretary-cantor-highlights-collaborative-ocean-stewardship-our-ocean>

## Science-Informed Management

The USGS and partners provide critical earth science to the Nation, including its inhabited territories. Five permanently inhabited territories in the Pacific Ocean and the Caribbean Sea are overseen by the U.S. and are home to more than 4 million people, many of whom are American citizens or U.S. nationals. With volcanic islands and tropical rainforests to breathtaking ocean views and coral reefs, these territories are post-card-worthy locales. However, due to their small area, immense amount of coastline, and often remote locations, these island territories are particularly vulnerable to climate change impacts, coastal hazards, invasive species, and other natural resource concerns. This interactive geonarrative highlights USGS science used by environmental managers and policy makers to address the myriad threats affecting America's territories.

Explore the geonarrative: <https://geonarrative.usgs.gov/americanterritoriesscience/>



An interactive geonarrative highlights USGS science used by environmental managers and policy makers to address the myriad threats affecting America's territories. Image credit: USGS.



The sun rising over the island of Ofu, American Samoa, during fieldwork in July 2022. Photo credit: USGS.

## Assessing Coastal Change

The USGS Coastal Change Likelihood (CCL) assessment is an updated version of the older Coastal Vulnerability Index (CVI), first published in 1999.

The CCL synthesizes over 20 existing datasets from a variety of federal, state, and private organizations to describe the landscape and the hazards that may affect it to evaluate the likelihood of coastal change along U.S. coastlines on a decadal scale. The CCL is focused on change over the next decade as a result of multiple coastal hazards. Technological updates and improvements in coastal data source quality and resolution have expanded coverage of the coastal zone, allowing this assessment to cover inland coastal areas, as well as the coastline; included higher resolution predictive decision support datasets and maps that are area-based; and uses a machine learning approach. The CCL data is more accurate, includes more complex information, and better accounts for geological and ecological variability and human development.

Explore the geonarrative online: <https://geonarrative.usgs.gov/ccl/>

Learn more: <https://www.usgs.gov/centers/whcmssc/science/coastal-change-likelihood>

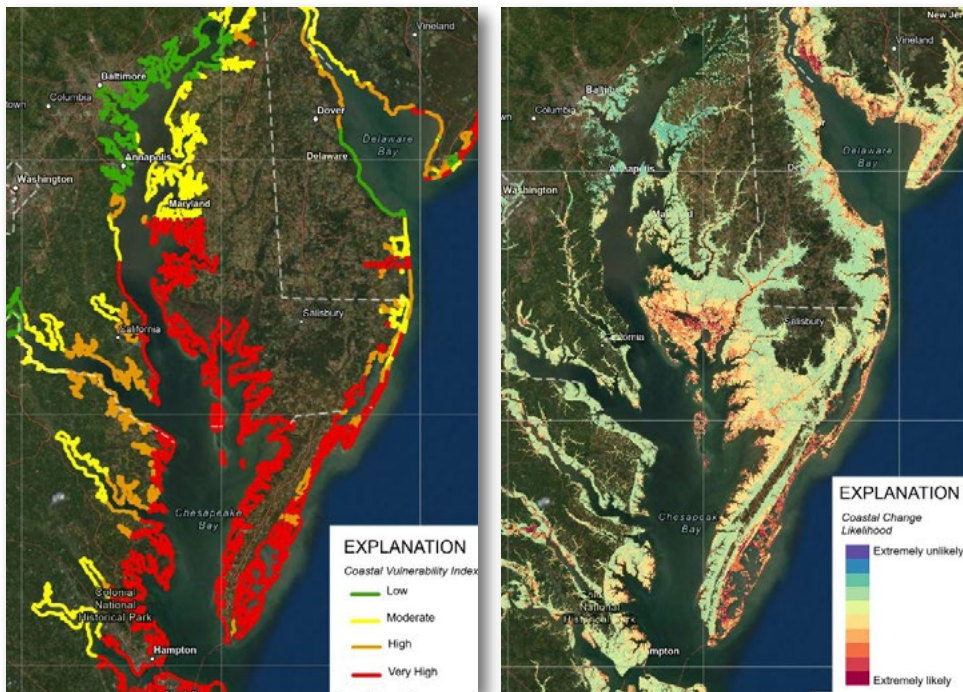


Above: Oblique aerial photograph near Rodanthe, North Carolina, looking south along the coast on August 30, 2011, three days after landfall of Hurricane Irene. Photo credit: Karen Morgan, USGS. Facing page: Tropical Storm Eta affected beaches along Florida's Gulf Coast in November 2020. Some dunes were eroded up to several feet due to the storm's high water levels. Photo credit: USGS.



## Harmful Algal Blooms: Science to Support Solutions from Shore to Shore

From freshwater to marine systems, the prevalence of harmful algal blooms (HABs) is a national environmental challenge, and solutions are needed. The NEIWPCC, a regional commission that helps the states of the Northeast preserve and advance water quality, worked with Federal and State partners to convene the 11TH U.S. Symposium on Harmful Algal Blooms in Albany, NY. Read more about how the NPS is working to keep coastal waters safe: <https://home.nps.gov/articles/one-health-disease-algal-blooms.htm>, <https://www.nps.gov/articles/000/habs-science-to-support-solutions-from-shore-to-shore.htm>



Comparing the CVI (left) and CCL (right) for the Delmarva Peninsula and Chesapeake Bay. For both assessments, warm colors represent higher vulnerability or likelihood of change. Image credits: USGS.



Above (left): Interns with the Women In Parks Canaveral National Seashore work to identify phytoplankton found in Florida coastal waters; (right): Autumn Moya (Scientists in the Parks) and Kathryn Finnerty (Citizen Scientist Volunteer) retrieve a SPATT while monitoring for HABs at Curecanti National Recreation Area. Photo credits: NPS, Nicki Gibney, NPS.

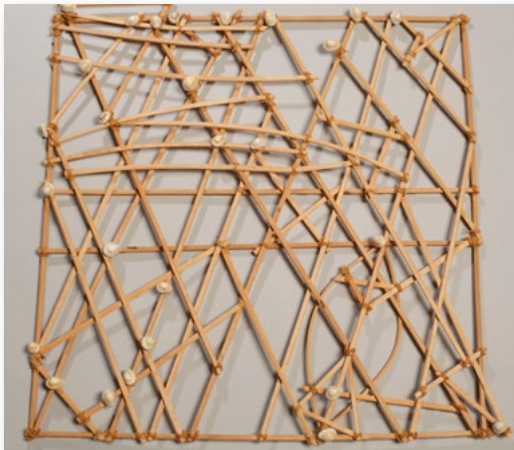


### \$12 Million to Combat Climate Change in the U.S. Territories

In May, DOI's Assistant Secretary Cantor and White House Council on Environmental Quality Chair Brenda Mallory announced \$12 million in key investments from the Inflation Reduction Act for climate change planning, mitigation, adaptation and resilience for the U.S. Territories of American Samoa, Guam, the Commonwealth of the Northern Mariana Islands and the U.S. Virgin Islands (USVI). Funding will increase coastal resilience across the U.S. territories through new infrastructure that will mitigate flooding, prevent erosion, improve stormwater drainage, and build stronger and more sustainable communities. "The Investing in America agenda presents an important opportunity for the territories in their efforts to plan for, mitigate the effects of, and build resiliency against climate change," said Assistant Secretary Cantor.

Read more: <https://www.doi.gov/pressreleases/biden-harris-administration-awards-12-million-through-investing-america-agenda-combat>

Learn more about DOI's Office of Insular Affairs: <https://www.doi.gov/oia>



Above: American Samoa villagers participate in traditional group dance. Photo credit: NPS.

At left-A rebelib or navigational stick chart from the Republic of the Marshall Islands. Sticks laced together form a framework that conveys to seagoing travelers key information on currents and ocean swells. Shells represent the locations of islands and atolls. Among the many treasures of the Interior Museum holdings is a rebelib or navigational stick chart from the Republic of the Marshall Islands. These are navigational maps made Pacific Island traditional seagoing navigators. Sticks laced together form a framework that conveys key directional information on currents and ocean swells. Shells represent the locations of islands and atolls. Photo credit: DOI. Visit the Interior Museum online: <https://www.doi.gov/interiormuseum/>



800 years ago, Native Hawaiians built large fishponds where they'd raise fish for the whole community. The spirit of the people and their expert masonry skills are evident in this fish pond wall at Kaloko-Honokōhau National Historical Park in Kona, HI. The NPS works with local communities to maintain these symbols of the past to restore and preserve them for the future. Photo credit: Ann Tihansky, USGS. Listen to 'Voices of Science' tell the fish pond story: <https://www.nps.gov/articles/fishponds.htm>



The moon rises in Glacier Bay National Park and Preserve. This park covers 3.3 million acres of rugged mountains, dynamic glaciers, temperate rainforest, wild coastlines and deep sheltered fjords, and is part of a 25-million acre World Heritage Site. Visit online: <https://www.nps.gov/glba/index.htm> Photo credit: Greta Ketchner, NPS.



## USGS and International Team Identifies Urchin Pathogen

In April 2023, USGS scientists were part of an international team that investigated the cause of urchin die-off through combined molecular, biological, and veterinary pathologic approaches to identify the pathogenic microbe. The team compared diseased and normal urchins from 23 sites across the Caribbean Sea.

In the 1980s, a fatal pathogen affecting the long-spined sea urchin (*Diadema antillarum*) decimated populations of this important herbivore. The cause of this mass mortality was never established, but it ultimately contributed to the continued decline of coral reef ecosystems through shifts in coral reef community structure.

In early 2022, when a similar disease emerged, USGS and partners focused on research to identify the cause of the disease. Understanding the source of the fatal urchin disease and stopping its spread is key

A dying long-spined urchin is in the process of losing its spines—which usually occurs within 1-2 days of being infected by a deadly pathogen. Photo by Ian Hewson, Cornell University. Used with permission.

information for reef managers to begin planning mitigation strategies. Protecting coral reefs into the future is critical as they are already under tremendous stress from changing environmental conditions, warming and rising seas, and coral disease.

Read more: <https://www.usgs.gov/centers/spcm/sc/news/usgs-and-international-team-identify-pathogen-responsible-2022-die-long-spined>



The long-spined sea urchin (*Diadema antillarum*), is an ecologically important species in Caribbean coral reef habitats where it controls algal growth and coverage and helps keep reef surfaces clear for corals to grow and settle. Photo credit: Christina Kellogg, USGS.



Top: A baby leatherback sea turtle (*Dermochelys coriacea*) hatched at Sandy Point National Wildlife Refuge (NWR), USVI heads to sea. Photo credit: DOI. <https://www.fws.gov/refuge/sandy-point> At left: Bureau of Land Management (BLM) Yaquina Head Outstanding Natural Area includes Oregon's tallest lighthouse standing at 93 ft., where it keeps watch over the rocky coast and the Pacific Ocean. Photo credit: Bob Wick, BLM. At right: The Ship John Shoal Light marks the north side of the ship channel in Delaware Bay on the Atlantic Ocean, near the Bombay Hook NWR. Photo credit: NPS. Learn more about the NPS Maritime Heritage Program: and Parks <https://www.nps.gov/maritime/parks/intro.htm> Visit Bombay Hook NWR online: <https://www.fws.gov/refuge/bombay-hook>



In March, Secretary Haaland and Senator Merkley (far right) visited the U.S. Fish and Wildlife Service (USFWS) Klamath Lake Fish Hatchery, and the Barnes and Agency Lake Units at Upper Klamath NWR as part of a trip to the Klamath Falls region, where they met with Tribes, irrigators, and DOI staff focused on the urgent water and wildlife issues impacting the Klamath Basin. Photo credit: DOI. Learn more: <https://www.doi.gov/pressreleases/during-visit-klamath-river-secretary-haaland-announces-four-tribal-water-projects>



Sunset at NPS Castillo de San Marcos National Monument. Built by the Spanish in St. Augustine to defend Florida and the Atlantic trade route, this historic coastal site preserves the oldest masonry fortification in the continental US and interprets more than 450 years of cultural intersections. Photo credit: NPS. Visit the site on-line: <https://www.nps.gov/casa/index.htm>



Above: In February, a boy on Falalop Island, Woleai, within the Federated States of Micronesia, greets the U.S. Coast Guard (USCG) crew of *USCGC Oliver Henry WPC 1140*. The week-long deployment supported Operation Rematau, countering illegal fishing and strengthening partnerships with the local island communities of several Yap outer island atolls. Photo credit: Chief Petty Officer Gene Asuncion, USCG. Below: Flowers of the plant known as the Santa Cruz Island live forever (*Dudleya nesiotica*). The plant is one of several rare plant species making a comeback due to restoration efforts. Photo credit: Katie Chess, USGS. Read more: <https://www.fws.gov/story/2022-11/two-channel-islands-plant-species-reach-recovery-thanks-endangered-species-act-and>

## Restoring Great Marshy Meadows

Great Meadows Marsh along the Atlantic coast of Connecticut has been through a lot in the last four centuries.

Now half the size and ailing from historical efforts to drain and fill it, as well as being invaded by nonnative plants, the Stratford, Connecticut, salt marsh sits powerless against sea-level rise. For the first time in decades, tides regularly flood the area, nourishing newly planted native salt marsh grasses, wildflowers, and shrubs. The restoration brings increased resiliency to sea-level rise and climate change and renewed potential to support rare plants and animals—including salt-marsh sparrow, turtles, and marsh pink—for years to come. The project's benefits reach far beyond its boundaries; to the community, the state, and the Atlantic Coast as a whole. Future restorations near and far will be better for the knowledge and experience gained at Great Meadows Marsh.

Explore a multimedia ArcGIS StoryMap about the project: <https://storymaps.arcgis.com/stories/24e64d93a2704efabb404abac4ecd2d3>



## Funds Support Restoring and Conserving Our Coasts

In March, DOI announced the distribution of over \$353 million in fiscal year 2022 energy revenues to the four offshore Gulf oil and gas producing states – Alabama, Louisiana, Mississippi and Texas, and their coastal political subdivisions (CPS), such as counties and parishes. The funds, disbursed annually based on offshore oil and gas production revenue, support coastal conservation and restoration projects, hurricane protection programs, onshore infrastructure projects, and activities to implement marine and coastal resilience management plans.

The Gulf of Mexico Energy Security Act (GOMESA) of 2006 created a revenue-sharing model for oil- and gas-producing Gulf states to receive a portion of the revenue generated from offshore oil and gas leasing in the Gulf of Mexico. The Act also directs a percentage of revenue to the Land and Water Conservation Fund (LWCF). This action represents the largest disbursement since the Department began disbursing GOMESA revenues to states and their CPS in 2009, reflecting increased production and market trends.

Learn more:

<https://www.doi.gov/pressreleases/interior-disburses-over-353-million-gulf-states-support-coastal-restoration-conservation>



Above: The Great Meadows Marsh restoration included native marsh grass plantings along a channel to bring the tide in and out. Photo credit: Lauri Munroe-Hultman, USFWS, Top right: The saltmarsh sparrow (*Ammodramus caudacuta*) is at risk from rising seas. The Great Meadows Marsh restoration included experimental, high-marsh hummocks to create safe places for sparrows to nest. Photo credit: USFWS. Opposite page: top: A baby alligator (*Alligator mississippiensis*) at Anahuac NWR in TX. Photo credit: Norman Welsh, USFWS; bottom: Sea cliff bedstraw (*Galium buxifolium*) blooms on Santa Cruz island, CA. Photo credit: Udi Ghoren, Brooks Institute (used with permission).







An osprey (*Falco Haliaeetus*) with a fish. More than 180 National Wildlife Refuges Refuges, protect coastal and ocean areas. Photo credit: USFWS Find Your Refuge here: <https://www.fws.gov/program/national-wildlife-refuge-system>



The EchoBoat-160 (affectionately dubbed the R/V Sea Lemon) is a bright yellow Autonomous Surface Vehicle (ASV) equipped with a multibeam sonar, complete with programmable survey paths and capable of mapping shallow or rocky waters that would otherwise be challenging for boats to navigate. NPS Coastal ecologists in the Alaska Region are using the ASV for offshore mapping that overlaps with long-term monitoring sites to provide a continuous dataset from exposed land on shore to submerged land, including seagrass, sand flats, and rocky habitats. One use of the data will be to determine factors connecting sea otter density and preferred habitat selection. Monique LaFrance Bartley, NPS. Learn more: <https://www.nps.gov/im/sean/monitoring.htm>



USGS researcher holds an invasive grass carp (*Ctenopharyngodon idella*) caught in the Sandusky River. OH. Photo credit: USGS.

### Controlling Invasive Grass Carp in Lake Erie

Grass carp (*Ctenopharyngodon idella*) are a troublesome, herbivorous species invasive to U.S. waters. Their overgrazing can damage aquatic vegetation communities, which can disrupt food webs for native fish and waterfowl, increase risk of wave erosion that damages property, and increase the risk of harmful algal blooms.

Grass carp were introduced to the U.S. in 1963 to reduce nuisance aquatic vegetation. After decades of use for biological control, grass carp can now be found in most U.S. states as well as Puerto Rico. Expansion of the grass carp range occurred through management stocking and natural dispersal and natural reproduction has now been documented in the Lake Erie basin. Grass carp have also been captured throughout the Great Lakes except Lake Superior.

Reducing or eliminating naturally reproducing grass carp populations is a high priority among multiple provincial, state, and federal management agencies because these negative impacts threaten the Great Lakes ecosystem and regional economy. Grass carp are mainly captured and removed from the ecosystem using boat electrofishing and trammel nets. In addition to catch and fishing effort data, scientists use biological samples from captured fish to estimate population size, fish age, growth rate, and differentiate between individuals originating from natural reproduction and unintentionally introduced sterile fish. Use of baits could increase the number of fish removed while reducing effort, thus improving the efficiency and effectiveness of response efforts. A team of USGS scientists is currently working with the Michigan Department of Natural Resources, Ohio Department of Natural Resources, USFWS, and academic institutions to evaluate the use of grass carp baits and attractants as a tool for resource managers.

To address the threats of future or further spreading, a group of fisheries managers and biologist armed with science and biology, known as the Lake Erie Committee, developed an Adaptive Response Plan to identify the most effective ways to remove these destructive, non-native fish.

Read the Plan: <https://invasivecarp.us/Documents/2021-Action-Plan.pdf>

## Belugas Count! Rare Whales Draw Crowds to Alaska's Coast

BLM and BOEM staff joined the 2022 Belugas Count! event hosted by NOAA Fisheries in September.

The annual event invites the public to join researchers, academics, trained volunteers and experts to look for, count and learn about Alaska's Cook Inlet beluga whales. The event fosters community pride, awareness and stewardship of the whale and helps provide data for NOAA researchers. The BLM manages onshore energy development on federal public lands within the watershed that empties into the Inlet, while the State of Alaska and BOEM oversees offshore energy development in Cook Inlet. This event brings everyone together in co-stewardship of the whales. According to NOAA's National Marine Fisheries Service in Alaska, the Cook Inlet beluga whale population has declined dramatically since the 1970s — from about 1,300 to less than 300 today — due to historical overhunting and possible environmental stressors such as underwater noise. Commercial and sport hunting of the whale are banned and traditional indigenous hunting of the species has been on hold since 2005. The whales, which live their whole lives in the inlet, were listed as endangered by NOAA



Secretary Haaland meets a beluga whale at the Mystic Aquarium. The Secretary learned how the beluga whales in the aquarium's care are instrumental in advancing research to conserve the endangered Cook Inlet beluga whale population in AK. During the visit Haaland also met Tribes, USFWS staff, other partners and scientists. Photo credit: DOI.



A white adult beluga whale (*Delphinapterus leucas*) is seen swimming with a gray calf in the Cook Inlet, AK. Photo credit: Hollis Europe and Jacob Barbaro, NOAA.

in 2008. Working together, federal and state agencies have ramped up their efforts to monitor and reduce noise pollution in strategic areas and seasons in the Cook Inlet. In 2017, the inaugural Belugas Count! event began turning up the volume on private partnerships and community outreach efforts to keep tabs on the population and promote conservation efforts. Glacier-fed rivers empty their silt-filled waters into the inlet, giving it a gray color. The juvenile beluga whales are born gray and are well-camouflaged. As they age, the gray calves turn white. Belugas other notable features include their ridged backs and their wide range of vocal sounds; they are sometimes called the canaries of the sea.



Hopeful whale spotters head to a viewing station. Photo credit: Melinda Bolton, BLM. Explore the interactive map: <https://adfg.maps.arcgis.com/apps/webappviewer/index.html?id=cb5405531bab4f83bf5f>



Above: A gray juvenile beluga whale (left) is seen swimming with an adult white beluga whale (right) in the silty Cook Inlet waters of Alaska. Photo credit: Chris Garner, Department of Defense. BLM's Alaska Marine Mammal Expert Craig Perham (yellow vest) talks with three visitors. With an estimated 279 beluga whales living in Cook Inlet, just spotting one of the small white whales or their gray calves is a sight to remember. Photo credit: Melinda Bolton, BLM.

# Secretary Haaland's NEWSWAVE 5

By Secretary Deb Haaland

Each NEWSWAVE issue, Secretary Haaland shares some highlights of the work DOI is doing to bolster our Blue Portfolio.

See these and other press releases at: <https://www.doi.gov/news>

Photo credits: DOI

## 1. Endangered Species Act is Saving the Turtles

This year I witnessed new baby turtles emerging from the beach sand and making their way to the ocean during my trip to the U.S. Virgin Islands. I was able to assist some of them to the water and it was an amazing experience to be a part of. It gave me a profound appreciation for the progress the Endangered Species Act (ESA) has and continues to make to protect wildlife throughout the past 50 years. Happy 50th Anniversary to the ESA!



## 2. White House Commitment to Ocean Conservation

In February, President Biden joined us at the Stewart Lee Udall Building for the White House Conservation in Action Summit. It was a gathering of advocates, organizers, non-profit organizations, and partners who care deeply about protecting our planet for future generations. During the summit, I spotlighted our new Restoration and Resilience Framework, which includes important projects to restore coasts, reinvigorate coral reefs, and protect our ocean.



## 3. A Safe, Clean Energy Future

During a trip to the Ohmsett facility, I saw first-hand the important work to keep offshore energy development safe. The tools, technology, and practices that the Bureau of Safety and Environmental Enforcement (BSEE) utilizes will be critical as we expand our offshore wind portfolio and live up to our clean energy potential and meet our ambitious goals.

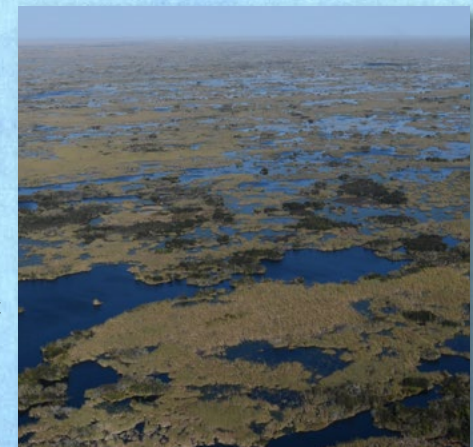
## 4. Working with Fellow Pacific Nations

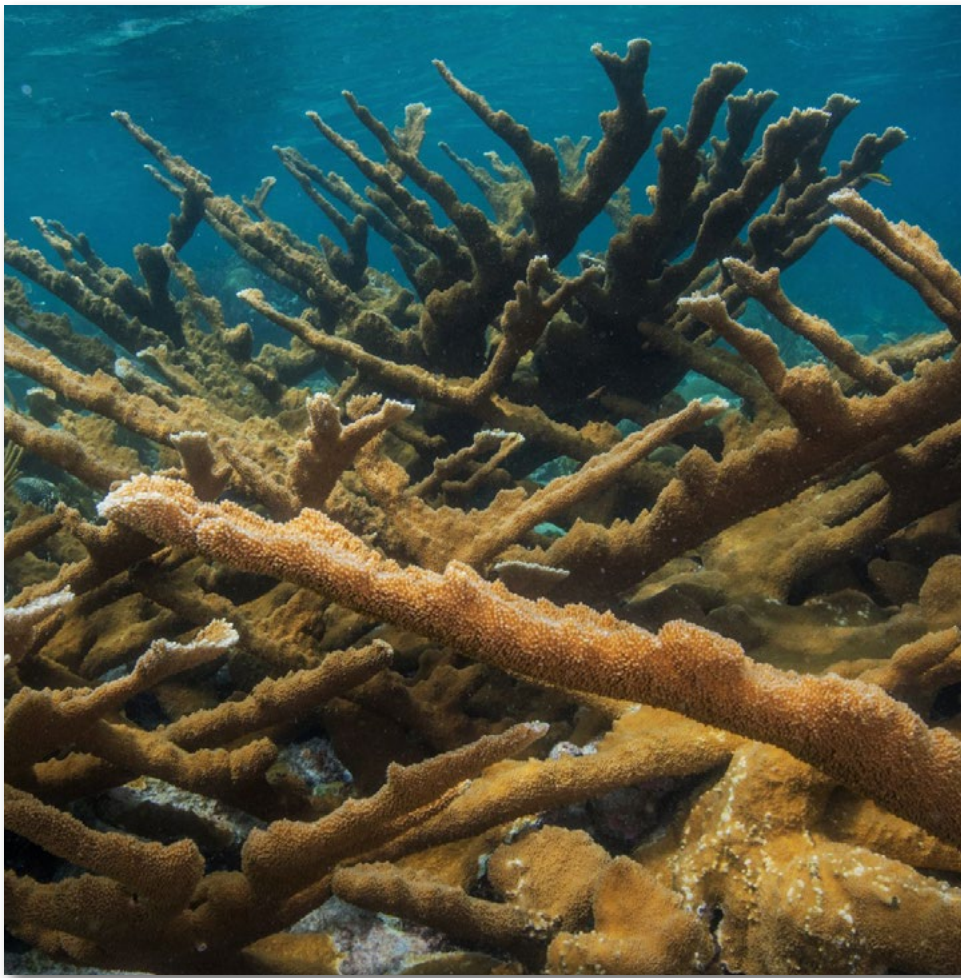
The United States is a proud Pacific nation. During my visits to New Zealand and Australia, I was honored to meet with our partners to discuss ways we can collaborate in the face of a changing climate. We highlighted the importance of Indigenous-led conservation and co-stewardship partnerships as key tools for addressing the climate and biodiversity crises. By centering Indigenous Knowledge and consultation with Native communities in policy discussions, governments around the world can better adapt public lands, natural resources, and wildlife management practices to the realities of a changing climate.



## 5. Ecosystem Restoration Investments to Help with Tropical Storms

The Everglades is a vast ecosystem that plays a role in the balance of nature. The special mix of fresh water and sea water supports plants that serve as a barrier in the face of coastal storms, and maintains the habitat for the wildlife in the area. I saw the results of collaborative conservation in action during my time in Southern Florida, which is at the heart of President Biden's America the Beautiful initiative, a locally led and voluntary, nationwide effort to conserve, connect, and restore the lands, waters, and wildlife upon which we all depend.





A healthy thicket of elkhorn coral (*Acropora palmata*) in Buck Island Reef National Monument (BIRNM), St. Croix, USVI. This species is critical for shoreline protection because it is the only species that builds reef-crest habitat in the Caribbean region. Photo credit: Susanna Pershern, NPS.

### Hope for Restoring Corals

Corals at Buck Island Reef National Monument (BIRNM) are part of a culturally and ecologically important location in St. Croix, USVI. The reef protects the island's beaches used by several threatened and endangered species like sea turtles, the St. Croix Ground Lizard and migratory shorebirds. Climate change, extreme temperatures, disease outbreaks and other stressors in recent decades have impacted the ability of reefs to grow. Over the last several decades these reefs have been eroding rather than growing. But there is hope.

New USGS research at a network of coral growth assessment stations throughout BIRNM shows that some eroding coral reefs could begin growing again if restoration goals planned for the area are achieved. The research supports NPS resource managers with information needed to prioritize areas for increased protection and restoration efforts.

Watch a video about this project at <http://ow.ly/1VJg50JZ5JR>,

Read the study: <http://ow.ly/jvYT50JZ5JQ>.



A dead, relict reef framework built by the elkhorn coral in BIRNM, St. Croix, USVI. Photo credit: Lauren Toth, USGS.



A small colony of outplanted elkhorn coral is seen in the foreground with a large, dead colony seen in the background. This experiment showed that outplanting efforts in BIRNM could be feasible for reef restoration. Photo credit: Ilsa Kuffner, USGS.



Eelgrass (*Zostera sp*) in Puget Sound, WA. Photo credit: Teal Waterstrat, USFWS.

### Restoring Productive Eelgrass Meadows through Partnerships

The USFWS Coastal Program contributes to conserving and restoring declining eelgrass beds in Washington's Salish Sea through work with partners statewide. Partnerships with the San Juan Islands Conservation District, Northwest Straits Commission, Friends of the San Juans, Washington State departments of Natural Resources and State Parks, Washington Marine Resources Committees, the San Juan Preservation Trust, and the University of Washington, involve technical assistance, science to advance new methods, and strategic financial investments to restore lost and degraded eelgrass beds. Efforts such as community-based outreach and experimental propagation and planting are reducing anchor damage to eelgrass beds and enhancing diverse biotic communities and habitat essential for spawning forage fish, threatened species such as the marbled murrelet, and countless species of invertebrates and migratory birds.

Learn more: Eelgrass propagation and outplanting:

<https://www.sanjuanislandscd.org/eelgrass>

Voluntary No-Anchor Zones:

<https://www.nwstraits.org/our-work/voluntary-no-anchor-zones/>

### The U.S. Fish and Wildlife's Coastal Program:



The 2022 Accomplishment Report is available online. Working with Communities along our nation's coasts, we conserve habitat on public and private lands to deliver land-scape conservation, build resilient coasts and communities, and maintain habitat connectivity and continuity, from headwater streams to the ocean.

Read the report: <https://bit.ly/3JxKdV2>

Learn more: [www.fws.gov/program/coastal](http://www.fws.gov/program/coastal)



Above: USFWS supports the not-for-profit EcoCenter in Texas which grows native salt marsh grasses in greenhouses to be used for restoring wetlands. Below: At the Barkhausen Waterfowl Preserve, 35 students from the Menominee Indian High School learned about wild rice harvesting and seeding wild rice. Photo credits: USFWS.



At Padre Island National Seashore in TX, Donna Shaver releases Kemp's ridley (*Lepidochelys kempii*) hatchlings at a public hatchling release (above) and Taylor Smith documents a nesting Kemp's ridley sea turtle on the Gulf of Mexico beach (below). Photo credits: NPS.

## Sea Turtle Science and Recovery

Sea turtles are one of the most iconic and popular animals in coastal areas.

All five of the sea turtle species found in the Gulf of Mexico rely on the Padre Island National Seashore park and its adjacent waters. Padre Island National Seashore is the only location in Texas where nests from all five of these species have been found. Kemp's ridley (*Lepidochelys kempii*) sea turtles, the most endangered sea



turtle species in the world nests here more than at any other location in the United States. Juvenile green (*Chelonia Mydas*) sea turtles live in the waters year-round and adults nest on Padre Island in low numbers. Loggerhead (*Caretta caretta*) sea turtles also nest in the park in low numbers and forage offshore. Leatherback (*Dermochelys coriacea*) sea turtles travel through the Gulf and historically nested here. Hawksbill (*Eretmochelys imbricata*) sea turtles also travel through the area, finding food and rest along the way. These species are all federally listed as either endangered or threatened.

Learn more: <https://www.nps.gov/pais/learn/nature/seaturtles.htm>

Current nesting season information: <https://www.nps.gov/pais/learn/nature/nesting-season.htm>

Sea Turtle Science and Recovery: <https://www.nps.gov/pais/learn/nature/stsr-index.htm>



California poppies (*Eschscholzia californica*) on the coast at the Salinas River NWR in CA. Initially established in 1973 because of its location along the Pacific Flyway, thousands of migrating birds flock to the refuge, seeking shelter and food in one of the few remaining wetlands along the central California coast. Photo credit: USFWS. Visit the refuge online: <https://www.fws.gov/refuge/salinas-river>



Bar-tailed Godwit (*Linosa lapponica*) spotted at Yukon Delta NWR with a upper left leg flag and a lower right leg band. The area is a prime location to experience the annual spring migration of Alaska's shorebirds. Kachemak Bay is a site of International significance in the Western Hemisphere Shorebird Reserve Network. Photo Credit: Nathan Graff, USFWS. Learn more about the Kachemak Bay Shorebird Festival <https://kachemakshorebird.org/>



### Monitoring Change in Alaska: Mountains to Maritime

The NPS Southeast Alaska Network is expanding ecological monitoring to the outer coast of Wrangell-St. Elias and Glacier Bay national parks and preserves. The relatively pristine Outer Coast is part of a United Nations Educational, Scientific and Cultural Organization (UNESCO) Biosphere Reserve and World Heritage Site. The region includes an impressive array of globally significant physical, geological, terrestrial, and marine resources, but is undergoing rapid change. Multiple stressors, including projected increases in air and ocean temperatures, increased rates of ocean acidification, changes in glacier mass balance and volume, isostatic rebound, and growth in vessel traffic and visitation have the potential to impact local ecosystems and landscape dynamics through both direct and indirect pathways. Given expected future changes to the region, establishment of an integrated multidisciplinary long-term monitoring program to better understand ecosystem processes and inform park management is essential. Learn more: <https://www.nps.gov/im/sean/index.htm>, <https://www.nps.gov/im/sean/outer-coast.htm>



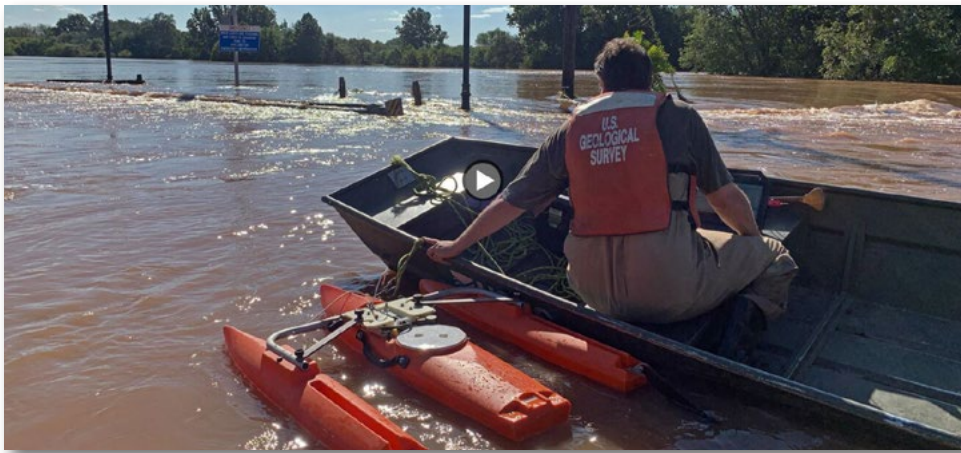
Above: Mt. St Elias in the distance. Below: Hubbard Glacier in Disenchantment Bay in Wrangell-St Elias National Park and Preserve. Photo credits: Jamie Womble, NPS.



For the first time, a brown bear (*Ursus arctos*) was observed on the coast of Katmai National Park and Preserve during the NPS Southwest Alaska Network's winter marine bird and mammal surveys in March. March is early for bears to emerge from hibernation, and this bear is in better condition than bears usually are in late winter. The sea otter carcass it is sniffing may help explain why this bear is so well fed. Photo credit: Deborah Kurtz, NPS. Learn more about bear predation on sea otters. Learn more: <https://www.nps.gov/im/swan/bears-otters.htm>



Kodiak brown bear (*Ursus arctos Middendorffii*) catches a coho salmon in Alaska. The USFWS shares stewardship of 16 refuges in AK totally over 76 million acres. Photo credit: Lisa Hupp, USFWS. Learn more: <https://www.fws.gov/about/region/alaska>



USGS scientists monitor hurricane floodwaters (above) and high water marks (lower right). Photo credits: USGS and Scott Green, USGS.

## Understanding Impacts of Climate, Hurricanes and Extreme Storms

Tens of millions of Americans live in areas vulnerable to hurricanes and tropical storms. Science can help improve hurricane forecasts and inform policy makers and managers as they prepare adaptation and mitigation plans to protect people, infrastructure and the environment. Studying the past provides baseline context and perspective of storm activity and insights on how climate and other environmental factors can influence hurricanes. Beyond impacts to the coasts, storm-related flooding often extends inland, far from the coast or occurring hundreds of miles inland. Sometimes flooding lasts weeks after the storm passes. Knowing where flooding occurs, how significant it might be, and where waters are rising is critical to helping reduce risks to people and communities. As part of the mission for natural hazards and public safety, the USGS provides State-of-the-art geospatial data, tools, maps, imagery, elevation data and more can aid local, state and federal agencies with disaster preparedness and response.

Read more:

<https://www.usgs.gov/news/featured-story/usgs-looks-back-2000-years-study-relationship-between-hurricanes-and-climate>

### Six-part series:

Introduction: <https://www.usgs.gov/news/featured-story/2022-atlantic-hurricane-season-here>

**Storm Tide Threats:** <https://www.usgs.gov/news/featured-story/storm-tide-poses-one-most-serious-hurricane-threats-people-and-infrastructure>

**Coastline Changes:** <https://www.usgs.gov/news/featured-story/changes-coastline-can-affect-where-and-how-severely-flooding-occurs>

**Threats Inland:** <https://www.usgs.gov/news/featured-story/hurricanes-may-pose-threat-people-along-coasts-and-far-inland>

**Hurricanes Spread Invasive Species:** <https://www.usgs.gov/news/featured-story/hurricanes-can-spread-invasive-species-if-they-survive-ride>

**Floodwaters Prepare Communities:** <https://www.usgs.gov/news/featured-story/determining-how-high-floodwaters-reached-helps-communities-prepare-future>



The Gulf of Mexico coastline in the Breton NWR provides important habitat for many species of birds. Photo credits: James Flocks (top), Rachel Villani (bottom), USGS.





## Restoring Important Shorebird Habitat

Breton NWR consists of a crescent sweep of low islands located in Breton Sound off the southeast coast of Louisiana. The USGS and USFWS are working together to restore this important wilderness habitat by creating bird nesting habitat following the Deepwater Horizon Oilspill. Watch these videos highlighting the project: <https://www.youtube.com/watch?v=yCf9kb4UY70>, <https://www.youtube.com/watch?v=c-h68bEGFqY>, <https://www.youtube.com/watch?v=2RNqvZj8dQw>



Top: Brown pelican (*Pelecanus occidentalis*) adult (left) and baby in the nest (right). Photo credit: Brynne Garner, USFWS and James Flocks, USGS. Below: Brown pelican rookery and nest in Cape Breton NWR. Photo credit: Sarai Piazza, USGS.



An eroded bluff at Colonial National Historic Park in coastal Virginia where NPS, the University of Virginia and The Nature Conservancy are developing innovative nature-based solutions to stabilize and mitigate ongoing erosion. Photo credit: NPS.

## Nature-Based Solutions for Coastal Resilience

The NPS is working with the US Army Corps of Engineers (USACE), "Engineering With Nature" (EWN<sup>®</sup>) Initiative and other partners to increase the resilience of coastal national parks in the face of sea level rise, increased storm surge and other climate change-related stressors. In Maine at Saint Croix Island International Historic Site, co-managed by the NPS and Parks Canada in consultation with the Passamaquoddy Tribe, a multi-disciplinary, international coalition of partners has been assembled to conduct research that informs potential nature-based solutions to stabilize and mitigate ongoing erosion at the site, which threatens the bluffs and historic resources.

Learn more:

<https://ewn.ercd.dren.mil/story-maps/preserving-history-in-cold-regions-saint-croix-island-maine/>

In the Chesapeake Bay area, NPS is also working with partners including University of Virginia and the USACE to develop innovative nature-based solutions to address coastal resource concerns such as coastal marsh loss, eroding bluffs and beaches, and climate change-related impacts to cultural resources at Colonial National Historic Park, Harriet Tubman Underground Railroad National Historical Park, and Assateague Island National Seashore. Together, the parks represent a range of environments and issues facing coastal parks in the Chesapeake Region more broadly.

Learn more:

<https://www.arch.virginia.edu/news/uva-faculty-and-phd-research-team-launch-chesapeake-coastal-resilience-project>

Visit these parks online: <https://www.nps.gov/index.htm>

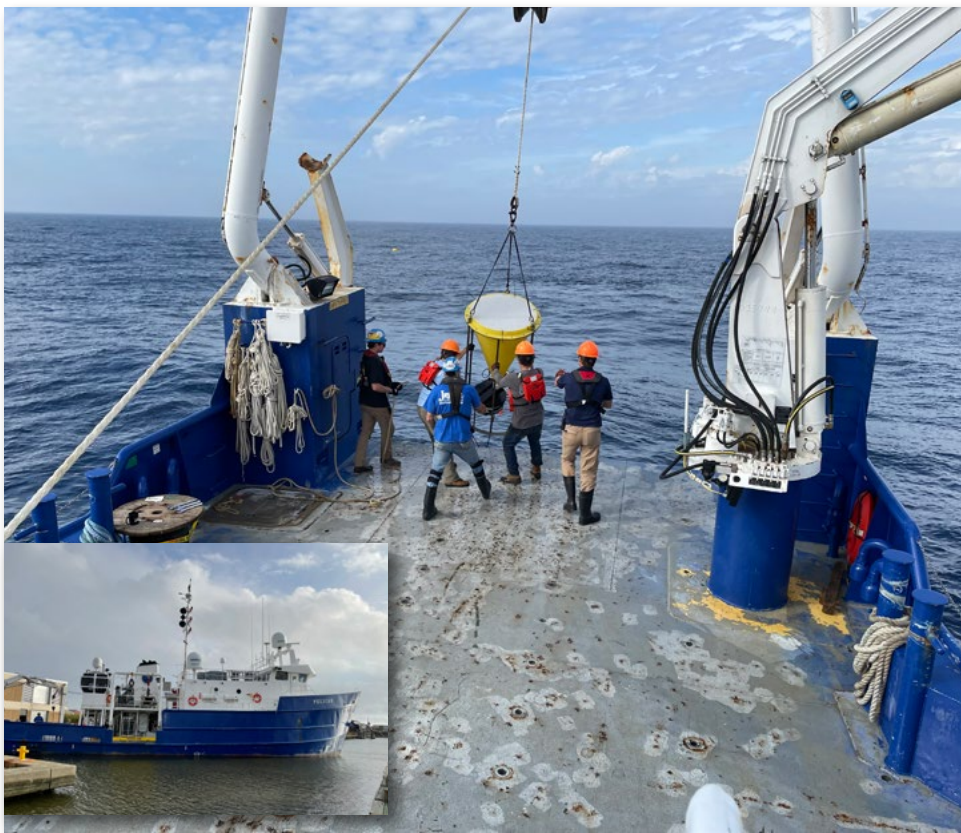
## Climate Stories from Marine Sediments

A USGS research cruise in January 2023 focused on collecting marine sediment samples using traps that collect particles over time as they sink down through the water column. After six months, the team collects the sediment from the trap and then redeploys the trap for the next round of sampling. Studying the particles allows our scientists to better understand the biological carbon pump and the role it plays in modulating Earth's climate through the drawdown of carbon dioxide.

Learn more: <https://www.usgs.gov/programs/climate-research-and-development-program/news/rv-pelican-research-cruise-dr-julie-richey>



An image of the live, single-celled foram (*Globorotalia truncatulinoides*) viewed under a microscope and collected with a plankton net on the *R/V Pelican*. Its shell is made from calcium carbonate and the spikes extensions are called rhizopodia. Image by Julie Richey, USGS.

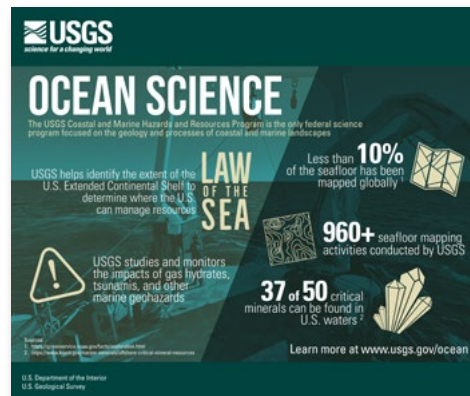


Crew aboard the *R/V Pelican* (inset) hoist a marine sediment trap out of the water and onto the boat. Sediment samples are collected from the sediment trap and then it is redeploys in the water column for another six months. Image by Ariana Sutton-Grier, USGS.

## Explore USGS Ocean and Coastal Science Online

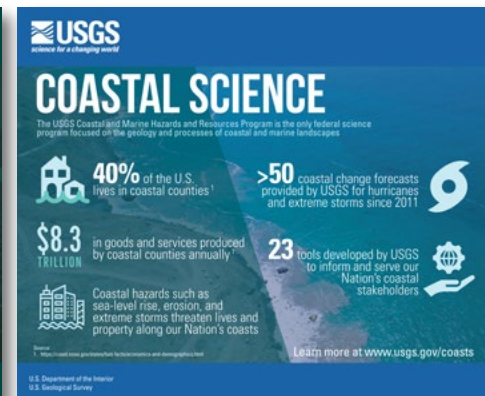


The ocean connects all Earth land masses. The U.S. coastlines (shown in **bright blue**) are almost 100,000 miles long. These extensive coastal areas stretch from Maine's Atlantic shores in the northeast, south along the shores of the Gulf of Mexico and insular areas in the Caribbean. Toward the west, Pacific coastal areas include the shores of California, Oregon and Washington as well as Alaska, Hawai'i and insular areas in the Pacific Islands. The Nation's coasts also include areas surrounding the Great Lakes, one of the largest freshwater ecosystems in the world. Altogether, our coasts are home to more than 40 percent of the population and support critical habitat for wildlife. Image credit: Betsy Boynton and Breanna Williams, USGS.



**Explore Ocean Topics:** Ocean 101, Mapping the Seafloor, Ocean Discovery, Great Lakes and Inland Seas, Marine Biology and Ecosystems, Marine Geohazards, Marine Geology, Marine Minerals and Offshore Energy, Ocean and Climate

<https://www.usgs.gov/science/science-explorer/ocean>



**Explore Coastal Topics:** Coasts 101, Climate, Coastal Change, Coastal Ecosystems, Coastal Hazards and Resilience, Wetlands and Estuaries

<https://www.usgs.gov/science/science-explorer/coasts>

Get more ocean and coastal science news. Read USGS *Sound Waves*: <https://www.usgs.gov/sound-waves-newsletter>



## Golden Anniversary for BOEM Environmental Studies Program

BOEM's Environmental Studies Program (ESP) celebrates its golden anniversary providing innovative scientific data that have helped inform the bureau's decisions for 50 years.

The vision of BOEM's ESP is to realize ocean stewardship through science. This approach complements BOEM's mission of managing development of U.S. OCS energy and mineral resources in an environmentally and economically responsible way. The ESP also seeks to align the program with the broader stewardship role the DOI plays in managing the Nation's public lands—the federal government and ocean users working cooperatively with mutual respect to achieve shared natural resource management goals.

Learn more: <https://www.boem.gov/environment/environmental-studies-program-celebrates-golden-anniversary>



At left: BOEM staff has been conducting a wide range of ocean research for 50 years. Photo credit: Ivan Hurzeler, BOEM. At right: BOEM scientists study undersea shipwrecks using remote technology viewing screens that share imagery from ocean depths. Photo credit: Patrick Flanagan, Inner Space Center, University of Rhode Island.



BOEM researchers conduct acoustic marine research in the field. In April 2023, the Director of BOEM's Center for Marine Acoustics, Jill Lewandowski appeared on The American Shoreline Podcast to discuss how BOEM uses science to guide its decision-making process for offshore wind development, particularly in relation to marine mammals and marine acoustics. Listen online: <https://www.coastalnewstoday.com/podcasts/separating-fact-from-fiction-the-truth-about-whale-strandings-and-offshore-wind-e21jsr/> Photo credit: photo by Matt Christenson, BOEM. Learn more: <https://www.boem.gov/newsroom/ocean-science-news/offshore-wind-and-marine-mammal-protection>





Aerial view of the breach at Fire Island, NY caused by Hurricane Sandy in 2012. To support the goals and requirements of the Coastal Barrier Resources Act (CBRA), USFWS completed the Hurricane Sandy Remapping Project in April 2022. This project modernized CBRS maps for nine Atlantic coast states, from New Hampshire to Virginia, and proposed the addition of nearly 300,000 acres of coastal habitat to the Coastal Barrier Resources System (CBRS). Photo credit: John Vahey, DOI. Learn more: <https://www.fws.gov/project/hurricane-sandy-remapping-project>

### 40 Years of Effective Coastal Policy: Coastal Barrier Resources Act (CBRA) (1982-2022) Saves Money, Protects Resources, Builds Resilience

Over its 40-year history, CBRA has been highly successful in achieving its goals. Coastal barriers and their adjacent coastal wetlands provide numerous benefits to the economy and society. In 2022, USFWS recommended that Congress expand the System by more than 275,000. These lands and waters serve as natural storm buffers; provide habitat for countless fish and wildlife species, including many at-risk species; support recreationally and commercially important fisheries; improve water quality; and create recreation and tourism opportunities that help support local economies. Development of these dynamic areas, however, often puts people in harm's way and can disrupt the natural movement and functions of the barriers, degrading habitat and increasing shoreline erosion. According to a study published in Conservation Biology, only about 15 percent of the world's coastal regions remain intact, while more than 60 percent of coastal ecosystems were under high levels of human pressure. As population growth and urbanization continue along the American coastline, the people, buildings, and infrastructure exposed to coastal storms and climate change risks will increase significantly as unspoiled habitat areas are simultaneously diminished.

Not only has CBRA been highly successful in reducing development intensity on coastal barriers, but it has also saved taxpayers billions of dollars. A study published in the Journal of Coastal Research estimated that the law reduced coastal disaster expenditures by an estimated \$9.5 billion between 1989 and 2013, and predicts that it could save as much as \$108 billion by the year 2068 (in 2016 dollars). These reductions in both development rates and the hardening of shorelines are important for numerous threatened and endangered species that are at risk due to the loss and degradation of coastal habitats, such as the rufa red knot (*Calidris canutus rufa*), piping plover (*Charadrius melodus*), and loggerhead sea turtle (*Caretta caretta*). acres through the remapping of the units along the North Atlantic coast. Learn more about CBRA: <https://www.fws.gov/program/coastal-barrier-resources-act>.

Additional reading:

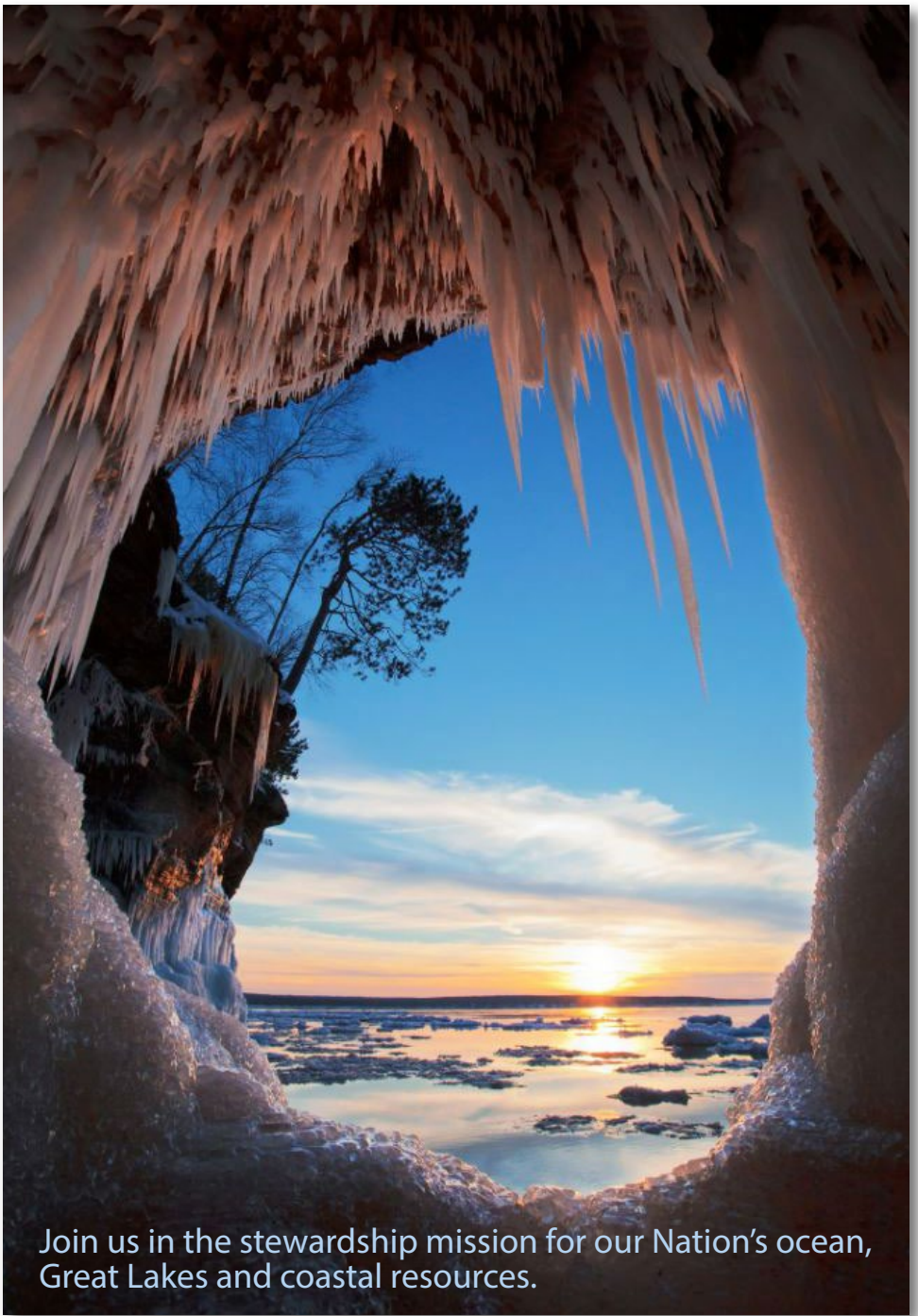
Removing federal subsidies from high-hazard coastal areas slows development: <https://www.fws.gov/project/hurricane-sandy-remapping-project/esajournals.onlinelibrary.wiley.com/doi/10.1002/fee.2532>



A purple gallinule (*Porphyrio martinica*) shows off its large feet, that help it wade on floating vegetation. Photo credit: Allen Hoffacker, USFWS. Learn more about this species: <https://www.fws.gov/species/purple-gallinule-porphyrio-martinica>



Through a partnership with the NOAA, North Carolina State and Duke Universities in the U.S., and sea turtle researchers in Dominica, BOEM is engaged in turtle hearing studies to better understand the acoustic impacts of bureau-authorized offshore activities. Photo credit: Jake Levenson, BOEM. Learn more: <https://www.boem.gov/newsroom/ocean-science-news/how-loud-too-loud>



Join us in the stewardship mission for our Nation's ocean, Great Lakes and coastal resources.

Peeking through icy caves at Apostle Islands National Lakeshore, WI. Photo credit: NPS.



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