

2019

Accomplishments Report

National Oceanic and
Atmospheric Administration

Marine Debris Program



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Letter from the Director

Across the globe, communities are working hard to tackle marine debris. Each project has an impact. Yet, when coordinated, these projects can do so much more. Here at the NOAA Marine Debris Program, we strive to support and elevate individual efforts through coordination on local, national, and international levels. The importance of coordination was reinforced in the Save Our Seas Act of 2018, which was signed into law last October. The law reauthorizes our Program through 2022 and expands our work in the areas of interagency collaboration, emergency response, and international action.

Though our work is expanding, we are still focused on and committed to tackling marine debris across our ten regions in the United

States, including the Pacific Islands and the Caribbean. We continue to work with academia, community-based organizations, industry, tribes, and government agency partners to develop local marine debris action plans and emergency response guides. We are dedicated to advancing these collaborative plans together with help from our many partners.

As we enter the last year of our Program's current strategic plan, I recognize the power of collective impact and the great progress that has been achieved as a result of coordination. It is my hope that the NOAA Marine Debris Program can continue to work with - and across - all sectors and levels of government to achieve a shared sea free of debris.

Nancy Wallace

Director, NOAA Marine Debris Program

2019 By-the-Numbers

35 new monitoring survey sites, **381** total

4,357 metric tons of marine debris removed



3 new marine debris action plans: Hawai'i, Oregon, and the Southeast

Over **10,000** students and nearly **500** teachers engaged



Responded to **Hurricanes Florence and Michael**, and **Typhoon Yutu**

2 new marine debris emergency response guides: Maryland and Texas



Zero Waste Initiative

The NOAA Marine Debris Program has been actively implementing zero waste efforts in our daily operations since we co-organized the Sixth International Marine Debris Conference (6IMDC) for over 700 attendees in March 2018. The 6IMDC zero waste efforts, which included limiting single-use items, composting, donating excess food, and recycling remaining conference materials, resulted in over 80,000 single-use items and nearly 3.4 metric tons diverted from the landfill. Using the momentum from the 6IMDC, the Marine Debris Program began incorporating zero waste initiatives into our meetings and workshops by supplying reusable coffee mugs and dishes, taking electronic notes, and refusing unnecessary handouts. This success has led to the formation of a larger Zero Waste Team in the National Ocean Service with representatives from each Program Office. In the coming year, the Team plans to refine and expand data collection methods, work on actions that will reduce waste in both daily office activities and at events, and encourage participation in zero waste efforts across the National Ocean Service.

Diverted
12,641
items from the
landfill

70%
of waste
diverted

463
participants
engaged

Implemented
initiative at
13 workshops



Save Our Seas Act of 2018

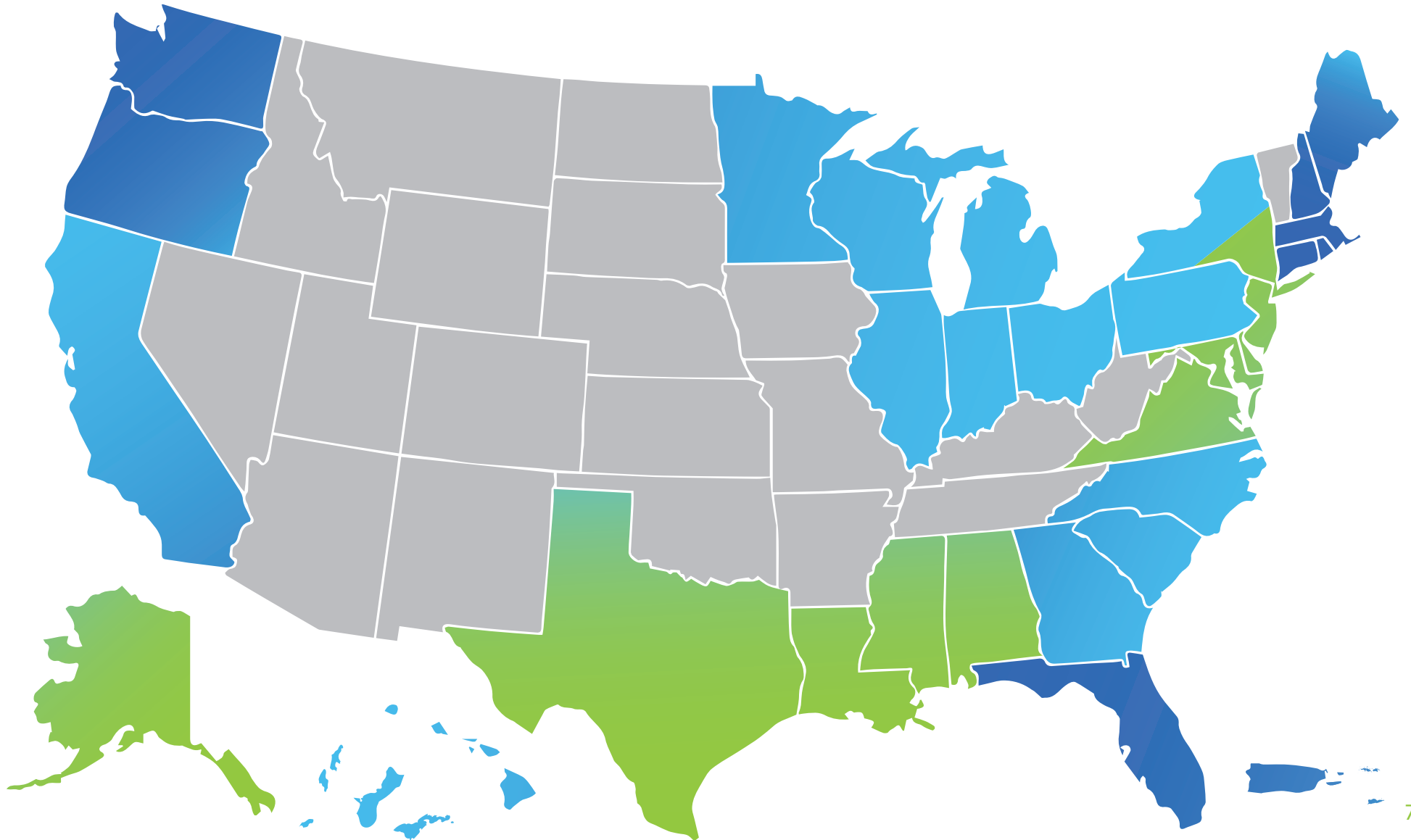
This past fall, Congress passed the Save our Seas Act of 2018 with bipartisan support, and the President signed the bill into law on October 11, 2018. The Act reauthorizes the Marine Debris Program for five years (2018-2022) and amends the Program's enabling legislation, the Marine Debris Act, in four main ways. Specifically, it directs NOAA to promote international action to reduce marine debris, gives NOAA the authority to declare severe marine debris events, directs NOAA to work with other federal agencies to develop additional outreach and education strategies to address sources of marine debris, and updates the membership of the Interagency Marine Debris Coordinating Committee. Through this Act, the Program will continue and expand upon its work to develop marine debris solutions.

International Collaboration

Marine debris is a global problem that touches every corner of our ocean. In 2019, the NOAA Marine Debris Program increased its efforts to work with international partners to address marine debris. Throughout the year, the NOAA Marine Debris Program provided technical support to government officials from nations in the Asia-Pacific Region, shared experiences through technical workshops, and provided leadership to the Global Partnership on Marine Litter and the Global Ghost Gear Initiative. These global partnerships coordinated international support on marine debris, and joined other United States government officials at key international events to provide insight on global marine debris solutions.

Marine Debris Program Regions

With impacts spanning every U.S. coastal and Great Lakes state and territory, no one person or organization can take on the problem of marine debris alone. The NOAA Marine Debris Program recognizes the importance of collaboration, and supports efforts at the local, regional, national, and international levels. The Program works to eliminate the adverse impacts of marine debris by providing local expertise and guidance to marine debris stakeholders, supporting numerous prevention and removal projects, facilitating communication and information sharing, and guiding regional planning activities. Some of this year's most successful efforts within each of the Marine Debris Program's 10 regions are highlighted in this report.



Great Lakes

Minnesota • Wisconsin • Illinois • Indiana • Michigan • Ohio • Pennsylvania • New York



30+ participating organizations

711 events hosted through plan actions

32 actions completed over the life of the plan

Five Years of the Great Lakes Land-based Marine Debris Action Plan

The Great Lakes marine debris community made great strides to address the issue over the past five years through the [Great Lakes Land-based Marine Debris Action Plan](#). Beginning in 2014, this community identified 53 action strategies focused on researching and publishing scientific articles, engaging with the policy and management community, educating the public and students, and removing debris from the environment.

Removing Ghost Nets in the Great Lakes

In the upper Great Lakes, the University of Wisconsin Sea Grant partnered with a local fishermen's association and law enforcement to develop a program to locate and remove ghost nets, otherwise known as lost fishing gear, and reduce threats to fisheries in Lake Superior. Through this project, Wisconsin Sea Grant created a kit that connects fishers to resources, including materials to mark ghost nets and a [portal](#) to report them for removal.



16,935 feet of net removed

710 kits distributed



373 volunteers for 824 hours

6,626 metric tons of debris removed

20 community clean ups

Clearing Construction Debris in Cleveland

On the site of a demolished amusement park, the Cleveland Metroparks removed remnant debris of concrete slabs, metal, and other debris items, which alter and harm the coastline of Lake Erie and nearby fish spawning areas. The Metroparks also partnered with Alliance for the Great Lakes to conduct a series of shoreline cleanups in Euclid Beach Park.

Northeast

Maine • New Hampshire • Massachusetts • Rhode Island • Connecticut



1,000+
K-12 students
engaged

229 beach
cleanup
volunteers

593 beach
cleanup hours

Community-based Campaigns to Cut Plastic Waste

Sea Education Association (SEA) worked with undergraduate SEA Semester students and local middle school students in Falmouth, Massachusetts to create a campaign to educate their community about marine debris and encourage businesses and consumers to reduce their use of single-use plastic items. Building on the middle schoolers' "Skip the Straw" campaign, the team designed a suite of effective communication tools, such as surveys and scorecards. Additionally, they developed a toolkit to expand the campaign both in the region and the SEA Semester students' hometowns, and conducted quarterly beach cleanups to raise awareness in the community.

Monofilament Recycling in Massachusetts

The Marine Debris Program partnered with NOAA Fisheries to help build and install monofilament recycling bins along the Massachusetts coast. Monofilament recycling bins provide a secure place for recreational fishers to deposit discarded fishing line, keeping it out of the waterway and inspiring stewardship among the next generation of anglers. In response to positive community feedback, partners constructed additional bins to distribute in New England communities and have inspired other regions to take action, with plans to install 70 new receptacles across Galveston Bay, Texas and O'ahu, Hawai'i.



9 recycling
bins installed
in 2018

30 additional
bins built in
2019

Mid-Atlantic

New York • New Jersey • Delaware • Maryland • District of Columbia • Virginia

Catching Crab Pots in New Jersey

The Conserve Wildlife Foundation of New Jersey partnered with local crab fishermen and Stockton University to retrieve derelict pots in Barnegat Bay. They also partnered with high school students from the Marine Academy of Technology and Environmental Sciences in the collection and analysis of data on the annual cycle of pot loss in New Jersey crab fisheries and the impacts of gear on different species. The Foundation designed and distributed informational postcards at festivals, local marinas, and through an exhibit on derelict fishing gear.



947 derelict crab pots collected

2.8 metric tons of debris removed

452 hours of student data collection and analysis

700+ people engaged through education and community outreach

347 volunteers participated in cleanup activities



Combating Litter in Baltimore City Communities

Trash Free Maryland, together with the City of Baltimore, the Maryland Port Administration, and multiple nonprofit partners, launched a multi-year social marketing campaign to reduce land-based litter in Baltimore, Maryland. The Less Litter, B-More Initiative promoted behavior change programming to reduce littering and engaged people through education and outreach activities. The project involved volunteers in cleanup activities and provided supplies to individual and small-scale cleanup efforts.

Southeast

North Carolina • South Carolina • Georgia



30+ acres of oyster habitat restored

267+ metric tons of aquaculture debris removed

Restoring Shellfish Aquaculture Habitat in North Carolina

The North Carolina Coastal Federation, in collaboration with Duke University Marine Robotics and Remote Sensing Lab and the NOAA Fisheries Beaufort Lab, removed aquaculture debris from an abandoned shellfish aquaculture site off of Harkers Island, North Carolina. Derelict debris like plastic netting, cages, buoys, PVC pipes, ropes, and rebar were left behind, posing a navigation hazard and scarring the marsh, seagrass, and oyster beds. The North Carolina Coastal Federation also worked with aquaculture growers to develop and disseminate [Shellfish Mariculture Best Management Practices](#), which provides guidance for new growers and lease applicants on how to prevent their gear from becoming marine debris.

Taking on Debris in the Town of Beaufort

The Town of Beaufort, North Carolina teamed up with the North Carolina Coastal Reserve and National Estuarine Research Reserve and the Atlantic Coast Marine Group to remove abandoned vessels, illegal moorings, derelict fishing gear, and other medium and large debris items. The team also removed shoreline debris through volunteer cleanups and worked with BoatUS Foundation to develop a professional documentary video showcasing the project.



56.5 metric tons of debris removed

11 abandoned or derelict vessels removed

115 students engaged



110 total actions

33 partner organizations

Southeast Marine Debris Action Plan

The [Southeast Marine Debris Action Plan](#) was created through the contributions of over 95 diverse marine debris workshop participants across three states, including government, nonprofit organizations, industry, and academic organizations. The purpose of the Action Plan is to address everyday marine debris and debris generated by disasters throughout Georgia, South Carolina, and North Carolina through coordinated actions by 2022.

Florida and the Caribbean

Florida • Puerto Rico • U.S. Virgin Islands



10 new water bottle filling stations installed

Changing Behaviors to Reduce Single-use Plastic

In St. Petersburg, Florida, Eckerd College is cultivating a community of environmental stewards who are acutely aware of their personal role in the generation of marine debris. Through this project, the College is working to reduce the consumption of single-use plastics across its campus by educating students on marine debris, providing access to alternatives to common debris items, conducting an audit on campus-wide departments, and working with the College administration to institute campus-wide prevention and reduction initiatives.

Ghost Trap Rodeo Event Series

Ocean Aid 360, in partnership with the Coastal Conservation Association Florida, mobilized a diverse group of boaters, anglers, and industry members that detected and removed derelict crab traps and other fishing gear from Florida's Tampa Bay estuary. They also conducted awareness campaigns and hosted a Ghost Trap Rodeo event series comprised of seven weekend-long marine debris removal competitions. These events were organized like shallow water fishing tournaments, but instead of weighing in fish, event participants weighed in abandoned crab traps, fishing gear, and other forms of marine debris.



Nearly 12 metric tons of marine debris removed

406 derelict crab traps removed



45 aquaculture stakeholders engaged

Supporting Aquaculture Gear Management Best Practices

The Florida Department of Agriculture and Consumer Services Division of Aquaculture hosted a shellfish aquaculture gear management workshop in Cedar Key, Florida. The workshop provided the aquaculture industry and shellfish farmers in Florida with resources and information about aquaculture debris issues including practical gear management techniques, proper gear anchoring methods, and severe storm preparation strategies. Individuals from the shellfish farming community, including local farmers and aquaculture business owners, attended the workshop and were provided resources to help prevent aquaculture debris.

Gulf of Mexico

Alabama • Mississippi • Louisiana • Texas



400 volunteers engaged

10 miles of shoreline restored

Nearly 4 metric tons of debris removed

Moving Toward a Litter-free Mardi Gras

Mobile Baykeeper partnered with the Mobile Bay National Estuary Program, Thompson Engineering, and the City of Mobile to reduce litter created by annual Mardi Gras celebrations in Mobile, Alabama. They reduced debris during the City's celebrations by installing permanent and temporary storm drain covers and concrete inlet screens along the parade route, and conducted a targeted media campaign to highlight how activities during the celebration can lead to debris accumulation. Together these efforts have improved the health of One Mile Creek, which leads to Mobile Bay, and eventually into the Gulf of Mexico.

Taking the "Jam" out of the Pearl River

The Southeast Aquatic Resources Partnership (SARP) and Southeastern Association of Fish and Wildlife Agencies (SEAFWA) facilitated the removal of man-made debris from a large log jam in the Pearl River, a natural boundary between Mississippi and Louisiana. SEAFWA and SARP, with the help of the U.S. Fish and Wildlife Service and multiple partners, removed man-made and woody debris to restore the river by improving connectivity, thereby allowing for fish passage and normal river flow, and decreasing nuisance flooding in areas upstream. This debris removal was a massive, collaborative effort bringing together multiple federal, state, and local agencies, non-governmental organizations, corporations, and local communities interested in restoring and protecting the Pearl River ecosystem.



8.5 metric tons of man-made debris removed

80 volunteers engaged in sorting debris

4 acres of Pearl River hydrology restored

California

Clearing Debris from Island Beaches

California State University Channel Island's (CSUCI) Santa Rosa Island Research Station staff, faculty, and students teamed up to clear the shorelines of Santa Rosa and Santa Cruz Islands off the coast of southern California. Staff and volunteers hiked down to beaches, surveyed the types of debris, and hauled it over rocky cliffs in heavy frame backpacks. CSUCI is using the data from repeated surveys to understand the different sources and types of debris found on the island. They also developed best management practices to remove debris on ecologically sensitive and culturally important island beaches.



2.8 metric tons of debris removed

371 beach cleanup volunteers

96 research volunteers



6 cleanups hosted

92 participants

3.85 metric tons of debris removed

Leaving No Traps Behind in the Channel Islands

Building off of several projects to document and remove debris in the Channel Islands, the Channel Islands National Marine Sanctuary (CINMS) worked to remove and reduce lost lobster traps with the help of the fishing industry. Working jointly with local lobstermen, CINMS accessed shorelines through support vessels and kayaks to remove derelict traps and other debris, and collected data on the debris found on beaches. Project partners are also working to reduce trap loss by promoting best practices shared by veteran fishermen and adhering to a new requirement to limit and tag traps.

Pacific Northwest

Washington • Oregon

490 students engaged

45 outreach events

671 pledges collected to-date

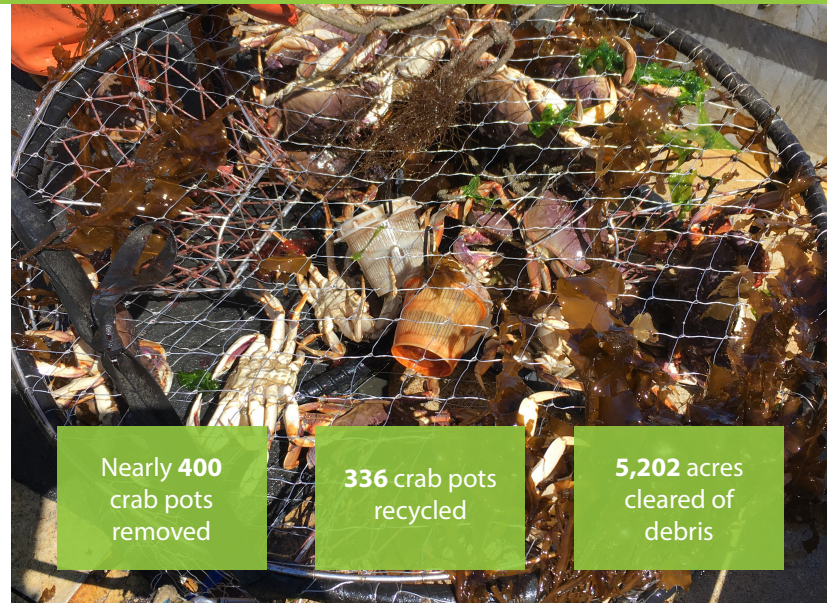


Rising Above Plastics in Oregon

Surfrider Foundation and its partners are working with the Oregon public, businesses, and legislators, as well as hundreds of students, to increase public awareness of plastic pollution and bring about behavior change. Reaching Oregonians through the Rise Above Plastic Pollution outreach Toolkit, social media, and outreach events, the project encourages people and businesses to avoid using single-use items and reduce plastic pollution by making pledges through a campaign during the month of May. To date, hundreds of people, including 43 State Legislators and Governor Kate Brown, have signed the pledge.

Reducing Recreational Crab Pot Loss in the Salish Sea

The Northwest Straits Foundation is collaborating with Natural Resources Consultants to prevent and remove derelict recreational crab pots in Dungeness Bay and Port Townsend Bay, in Washington, two areas of high pot loss. Through this project, Northwest Straits Foundation is using side scan sonar to locate derelict pots, then remove them using expert divers. Concurrently, the project is conducting targeted outreach to recreational fishermen in the area through educational workshops, and assessing the impact of these outreach efforts on the number of pots lost.



Nearly 400 crab pots removed

336 crab pots recycled

5,202 acres cleared of debris

104 crab pots located

4.4 metric tons of debris removed

30 fishers engaged



Removing Crab Pots from Tribal Fishing Grounds

On Washington's Olympic Coast, the Makah Tribe is working to remove derelict crab pots and lines from the Tribe's Usual and Accustomed Fishing Area and the Olympic Coast National Marine Sanctuary. Through a partnership with Tribal Natural Resources Enforcement, the Tribe used aerial surveys and the Makah Tribal Enforcement Vessel to locate and remove crab pots and lines that pose an entanglement hazard for wildlife, as well as salmon fisheries gear. The Makah Tribe is also creating a Tribe-managed self-sustaining lost fishing gear prevention, reporting, and recovery program to prevent gear from becoming lost in the future.

Alaska



3 metric tons of debris removed from over **80** local beaches

167 volunteers engaged

Debris Removal and Monitoring in Kodiak

The Island Trails Network worked with the local community in Kodiak, Alaska to remove debris from local beaches. Volunteers from local schools and organizations gathered, sorted, and measured debris, such as fishing gear, nets and lines, and consumer plastics, such as bottle caps and straws. The Island Trails Network also engaged participants in the analysis of cleanup data and the creation of outreach materials, and conducted marine debris monitoring using the NOAA Marine Debris Monitoring and Assessment Project survey protocols.

Zero Waste Campaigns Across the Kenai Peninsula

The Center for Alaskan Coastal Studies expanded its zero waste program to new schools and classes across the Kenai Peninsula. Experienced teachers and students assisted new participants in implementing zero waste campaigns in their classrooms and on their campuses, measuring trash production and identifying opportunities to reduce waste. Students joined local cleanups in Kachemak Bay, and additional local businesses enrolled in the Green Star program - a certification program promoting sustainable business practices.



56.5 metric tons of debris removed

11 abandoned or derelict vessels removed

115 students engaged

Pacific Islands

Hawaii • Guam • American Samoa • Commonwealth of the Northern Mariana Islands

2018 Hawai'i Marine Debris Action Plan

Hawai'i experiences high volumes of marine debris across all islands that are a great risk to its delicate ecosystems, community, and economy. The [Hawai'i Marine Debris Action Plan](#) (HI-MDAP), originally published in 2010, was the first of its kind developed in the nation. Its purpose is to reduce the ecological, health and safety, and economic impacts of marine debris in the Hawaiian islands by 2020. Published in January, the plan was reviewed and updated by community stakeholders in 2018 and will continue to operate until its ten-year conclusion.



120 total actions

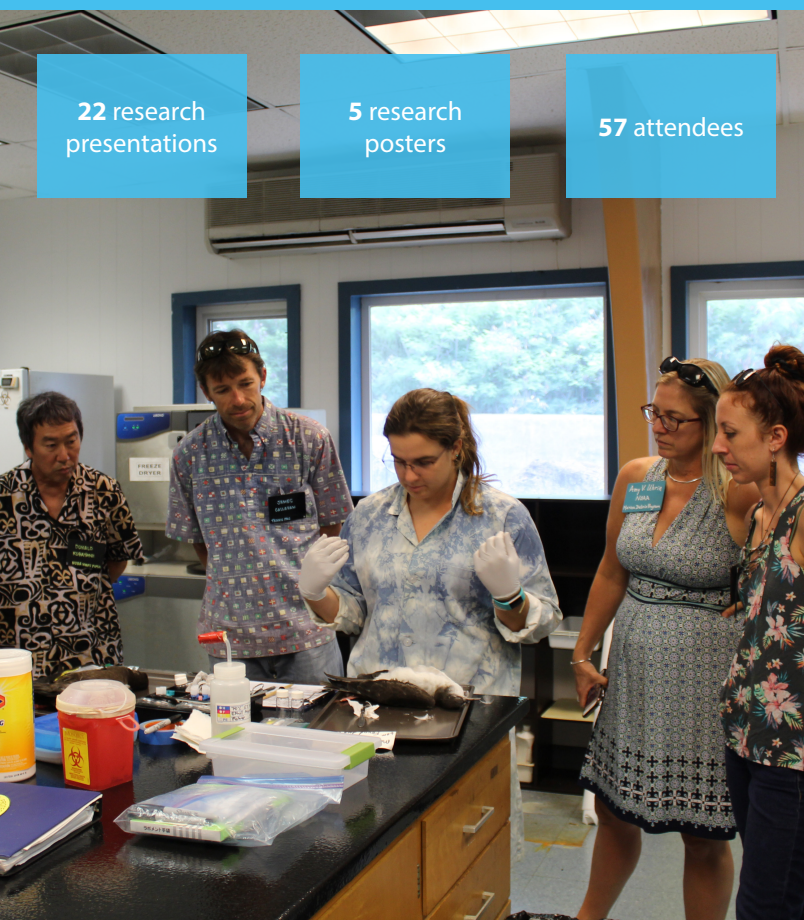
36 organizations

40 partner representatives

22 research presentations

5 research posters

57 attendees



Hawai'i Marine Debris Action Plan Research Workshop

In July, Hawai'i marine debris researchers participated in the 2019 Hawai'i Marine Debris Action Plan Research Workshop, co-hosted by the NOAA Marine Debris Program and the National Institute of Standards and Technology. Workshop participants representing nonprofit, state, federal, and academic groups presented on diverse topics such as microplastic ingestion, innovations in reusing marine debris, and tracking technologies. Researchers in Hawai'i are passionately engaging in new and exciting research that will inform the issue of marine debris both in the Hawaiian Islands and around the world.

Northwestern Hawaiian Islands Removal Mission

The Papahānaumokuākea Marine National Monument is the largest protected marine conservation area in the United States. The islands and their surrounding waters are of significant natural and cultural importance, and Papahānaumokuākea's landscapes contain numerous archeological sites that are essential to Native Hawaiian culture and history. The islands' shorelines, coral reefs, and waters provide critical habitat to thousands of marine species, while its nearshore environments are vital to the survival of millions of sea birds, endangered Hawaiian monk seal, and threatened green turtle populations.

The Northwestern Hawaiian Islands are a part of the most remote archipelago in the world. However, the islands isolation doesn't make them immune to marine debris. An estimated 52 metric tons of marine debris, mostly made up of derelict fishing gear, finds its way to the Monument every year. Large and heavy derelict fishing nets can crush and damage reefs. Fishing gear can pose entanglement risks and lead to injury, illness, suffocation, starvation, and even death. Pieces of plastic can be mistaken for food, and ingestion of marine debris can lead to loss of nutrition, internal injury, and starvation.

Removing this marine debris is a crucial part of protecting the Monument's health and responsibly stewarding Papahānaumokuākea. Since 2006, the NOAA Marine Debris Program has been a partner in the NOAA Pacific Island Fisheries Science Center Marine Debris Removal Project. This effort is a major multi-agency undertaking that aims to remove nets and plastics with a priority focus on hazards to Hawaiian monk seals, green sea turtles, and sea birds. The latest removal mission took place in September and October 2018. Debris from the mission was disposed of through the Hawaii Nets-to-Energy Program, art projects, and various recycling programs.



Removal Mission By-the-Numbers

19 crew members

41-day mission



6 islands surveyed: Kure, Midway, Pearl and Hermes, Laysan, Lisianski, French Frigate Shoals

74 metric tons of debris removed (164,013 lbs, 111,581 lbs of net)



Emergency Response

Natural and man-made disasters can produce large amounts of marine debris, making the problem of debris on our coasts and in the ocean much worse. In 2019, the NOAA Marine Debris Program worked with local, state, tribal, and federal partners around the country to improve preparedness for natural and man-made disasters through the development of new marine debris response guides for Texas and Maryland. These guides outline existing structures to facilitate coordinated, well-managed, and immediate responses to emergency marine debris events. Additionally, the Program assisted with response efforts after Hurricanes Florence and Michael and Typhoon Yutu and administered supplemental funding to support marine debris cleanup efforts for those states impacted by Hurricanes Harvey, Irma, and Maria.





Hurricane Michael Response

The NOAA Marine Debris Program participated in the response to the massive amounts of debris generated during the 2018 hurricane season, and directly supported the activities to respond to Hurricane Michael. In cooperation with the Federal Emergency Management Agency, United States Coast Guard, Florida Fish and Wildlife Conservation Commission, and other NOAA offices, staff from the Marine Debris Program supported activities to mitigate pollution threats in the Florida Panhandle caused by oil and hazardous materials from vessels displaced during the storm.

Taking on Storm Debris in South Carolina

The South Carolina Department of Health and Environmental Control (SCDHEC) Office of Ocean and Coastal Resource Management was awarded over \$174,000 in disaster relief funding through a NOAA Marine Debris Program grant to remove marine debris from the coastal marshlands and tidal waters left in the wake of Hurricane Irma. With support from contractors, SCDHEC removed and disposed of vessels and large aggregations of debris at several sites in Charleston County, near the cities of Charleston and Folly Beach.



Recovering Coastal Marshlands in Georgia

Following the destruction from Hurricane Irma, the Georgia Department of Natural Resources (GA DNR) was awarded \$600,000 in disaster relief funding through a NOAA Marine Debris Program grant to remove storm debris from the state's coastal counties. Removal efforts are targeting vessels, construction materials, and floating docks made of concrete, foam, and plastic, that remain submerged or lodged in coastal marshlands. With the help of a contractor, the GA DNR anticipates removing over 12 million pounds of debris to allow these marshlands to regenerate vegetation critical for habitat and coastal protection.

Research

Despite being a global problem, marine debris is still a relatively new field of research with many unanswered questions. The NOAA Marine Debris Program funds research projects across the United States that help expand our understanding of debris by answering some of our greatest questions about where debris comes from, how it moves in the environment, the chemical impacts to wildlife, and the ways it affects our economy.



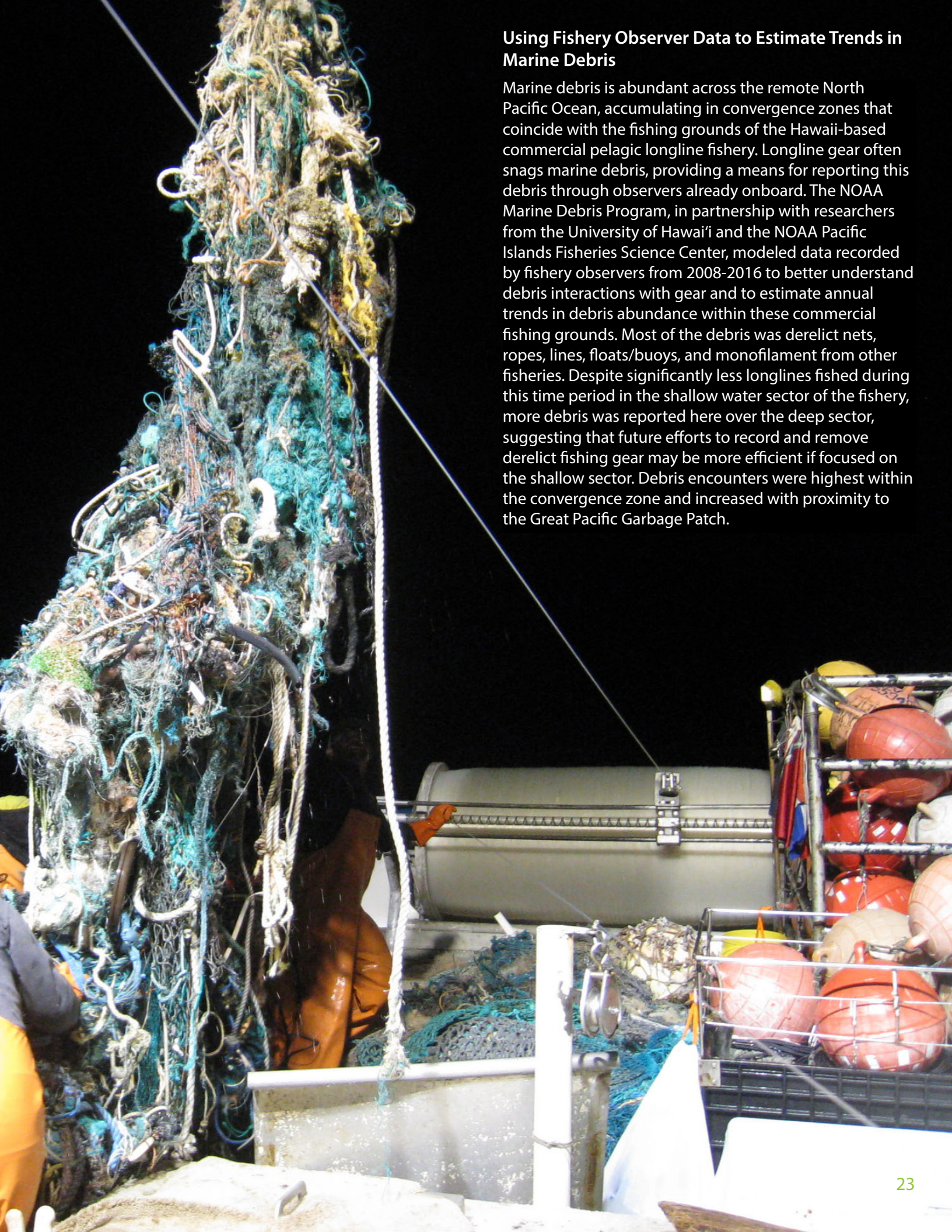
Tracking Microplastics in the Mississippi River

In the largest river basin in the United States, researchers from Texas A&M University Corpus Christi collected water samples from 11 locations along the Mississippi River to better understand the amount and type of microplastic debris found in the river and released into the Gulf of Mexico. Using a special protocol for collecting microplastics in rivers with large amounts of sediment and floating debris, researchers found that the most common microplastics were semi-synthetic microfibers, which are popularly used in textiles for clothing. These results suggest that a majority of the microplastics found in the Mississippi River and its tributaries could be shed from our clothing in the wash, which then enters treated wastewater, discharges directly into the river, and eventually ends up in the Gulf of Mexico.

Economic Effects of Marine Debris on Coastal Communities

To better understand the relationship between coastal tourism economies and marine debris, the NOAA Marine Debris Program funded [a study](#) with Abt Associates to look at how the amount of marine debris on beaches can affect the behaviors of beachgoers and the economies of coastal communities that depend on tourism. The results of the study revealed that doubling the amount of marine debris on beaches within the study areas would decrease the number of visitors to those beaches. This decline in beach visitors would result in less tourism dollars spent, and translate into a decrease in local jobs. This study deepens our understanding of the economic impact of marine debris to tourism-dependent coastal communities, and illustrates the importance of marine debris prevention and removal efforts.





Using Fishery Observer Data to Estimate Trends in Marine Debris

Marine debris is abundant across the remote North Pacific Ocean, accumulating in convergence zones that coincide with the fishing grounds of the Hawaii-based commercial pelagic longline fishery. Longline gear often snags marine debris, providing a means for reporting this debris through observers already onboard. The NOAA Marine Debris Program, in partnership with researchers from the University of Hawai'i and the NOAA Pacific Islands Fisheries Science Center, modeled data recorded by fishery observers from 2008-2016 to better understand debris interactions with gear and to estimate annual trends in debris abundance within these commercial fishing grounds. Most of the debris was derelict nets, ropes, lines, floats/buoys, and monofilament from other fisheries. Despite significantly less longlines fished during this time period in the shallow water sector of the fishery, more debris was reported here over the deep sector, suggesting that future efforts to record and remove derelict fishing gear may be more efficient if focused on the shallow sector. Debris encounters were highest within the convergence zone and increased with proximity to the Great Pacific Garbage Patch.

Looking Ahead

The NOAA Marine Debris Program is looking forward to launching 14 newly-funded removal and research initiatives, as well as 8 Fishing for Energy projects. Here is a look at the year ahead.

Removal

Aleut Community of St. Paul Island will remove at least 30,000 pounds of marine debris from shoreline and beach habitat. The community will also conduct shoreline monitoring in critical and sensitive habitat for marine mammals including northern fur seals, steller sea lions, and harbor seals. This project is the first marine debris removal effort on Otter Island and the first effort to transport debris off St. George Island.

Buffalo Niagara Waterkeeper, Inc. will remove surface marine debris in New York's Niagara River/Lake Erie watershed, conduct river and upland cleanups, install Reel In and Recycle monofilament bins at popular fishing sites, and host multilingual pollution prevention workshops for the City of Buffalo's refugee community. The debris will include derelict fishing gear, single-use plastics, and other debris in the waterway.

Swinomish Indian Tribal Community will inventory, remove, and repurpose (when possible) derelict fishing gear and fishing-related marine debris in the Swinomish Channel and Similk Bay, located within the Swinomish Indian Tribal Community in Washington State. They will also develop and implement a prevention plan to protect the docks, keep them free of gear and debris, and provide a monitoring and enforcement mechanism that will ensure the guidelines are followed.

Lake Pontchartrain Basin Foundation will remove approximately 6,000 derelict crab traps from the Pontchartrain Basin in Louisiana through a partnership with the Virginia Institute of Marine Science and community volunteers. The project team will collect biological data on contents, location, and condition of traps, which will be valuable for determining the economic impact of the lost traps.

New York City Department of Parks and Recreation will remove 441,000 pounds of medium-to-large debris at two critical salt marsh sites in Queens, New York. The project consists of three components: 1) contractor removal of large-to-medium debris, including at least six boats, 2) a volunteer project to remove smaller debris with approximately 25 volunteers, and 3) pre- and post-removal monitoring to assess improvements to ecosystem health and determine the need for post-removal restoration at the sites.

Island Trails Network will remove approximately 16 metric tons of marine debris from coastlines within a 1,647-mile area of the Kodiak, Alaska archipelago. This project will also conduct debris monitoring using NOAA protocols and, when possible, recycle collected debris.

Guam Environmental Protection Agency, in partnership with the Guam Department of Agriculture, Division of Aquatic and Wildlife Resources, will remove a nearly 50-year old tire reef in the Manell-Geus Habitat Focus Area, an area widely used for recreation, fisheries, and commercial tourism. The proposed removal target - a tire reef created in the 1970's by fisheries scientists as an experiment to increase fish stocks - carries the risk of creating more debris that damages sensitive habitats and species, and is a source of heavy metal contamination.

Richardson's Bay Regional Agency will remove and abate approximately 25 marine debris vessels, encourage voluntary repairs or removal of marine debris vessels from sensitive habitat, and prevent vessels from becoming marine debris. This project strives to remove more than 250 tons of marine debris, including disruptive anchor chain and toxic liquids and materials, from Richardson's Bay in California.

North Carolina Coastal Federation will evaluate and remove marine debris in North Carolina's estuaries that were hardest hit by Hurricane Florence. Additionally, they will develop best management practices for prevention, removal, and disposal of hurricane marine debris, promote resilient building codes for structures such as docks built in public trust waters, and engage stakeholders through public outreach and volunteer cleanups.

University of the Virgin Islands will remove hurricane-deposited marine debris from vulnerable mangrove shorelines in marine protected areas and NOAA Coral Reef Program Priority Areas in the U.S. Virgin Islands through a series of annual "Great Mangrove Cleanups." The project also builds capacity to address future marine debris challenges by developing a territorial Marine Debris Action Plan, a living policy document that will coordinate and prioritize marine debris prevention, removal, and research activities across the Territory.

Research

Regents of the University of California at Riverside will investigate the origins and pathways of microplastic pollution in the Southern California Bight using modeling and field measurements of riverine and wastewater treatment inputs. This will enable the scientific and management communities to better understand the fate and transport of microplastics in the Southern California Bight and will also inform potential management strategies to more effectively prevent such debris from entering the environment in the first place.

Rutgers University will study the movement of microplastics from riverine to oceanic systems and the role this area may play as the entry point for microplastics into the food chain. Unique oceanographic characteristics exist where rivers and the ocean meet, and these characteristics may influence the movement of marine debris from one system to the other and the assimilation of microplastics in the marine food chain.

University of Delaware will evaluate the effects microplastics have on blue crabs and test whether exposure during their (larval) developmental stages impacts blue crab survival and settlement to Mid-Atlantic Bight estuaries. This will be done through a combination of modeling, laboratory studies, and field measurements, with the goal of understanding individual and population-level effects.

Virginia Institute of Marine Science will examine whether microplastic ingestion increases disease susceptibility in steelhead trout, a commercially important salmonid species. New information suggests that exposure to very small microplastics and fibers may affect immune health, and research on the link between microplastic ingestion and disease expression will inform efforts by the scientific and management communities to address this problem.

The Kaho'olawe Island Reserve Commission will detect, assess, and remove derelict fishing gear and debris from Kanapou Beach on the island of Kaho'olawe. The project will remove damaging debris to conserve coral reefs and test their use in reducing erosion in upland habitats.

Mālama Nā 'Apapa will locate and remove debris from the reefs and adjacent shorelines along the north and east shores of Kaua'i. This debris consists of lost drift nets, derelict fishing gear, and items washed out to sea during two major flooding events in 2018.

Florida Department of Environmental Protection will remove derelict fishing gear from artificial reefs in Charlotte Harbor. The project will properly remove and recycle gear and coordinate with local counties and volunteer divers to monitor the reefs.

Quinault Indian Nation will develop a program to reduce derelict nets from coastal riparian corridors and properly dispose of them to prevent their entry into the Olympic Coast National Marine Sanctuary. The project will inform fishermen and the community of the ecological effects of abandoned and lost derelict gear, conduct cleanups, and develop a new gear tracking system.

Monterey Bay Fisheries Trust will modify existing gear retrieval program in Monterey Bay to comply with new California state regulations. The project will engage local fishermen and partner organizations to coordinate a voluntary gear retrieval program that removes lost or abandoned crab gear prior to entanglement with marine animals.

College of William and Mary, Virginia Institute of Marine Science will engage citizens and commercial watermen through the use of a "Crab Trap App" to identify hotspots of blue crab fishing activity and trap loss. This information will be used to identify and remove derelict gear in the Chesapeake Bay.

Fishing for Energy

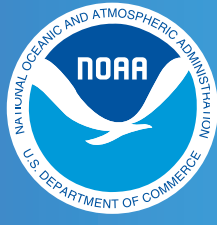
Fishing for Energy, a partnership between the NOAA Marine Debris Program, National Fish and Wildlife Foundation, Covanta Energy, and Schnitzer Steel Industries, launched newly-funded projects to prevent and reduce the impacts of derelict fishing gear in the marine environment. MDP contributed funding to the following eight projects.

Cornell Cooperative Extension of Suffolk County will remove 3,640 derelict lobster pots from the Long Island Sound using a specialized grapple system. The project will engage local lobster fishermen in the removal effort, reduce debris in the Sound, and minimize ghost fishing impacts on the depleted Southern New England lobster stock.

Sea Mammal Education Learning Technology Society will test and evaluate ropeless lift bag fishing gear with lobster fishermen and NOAA gear experts to reduce vertical lines that can entangle endangered North Atlantic right whales.

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NOAA Marine Debris Program

Office of Response and Restoration

National Ocean Service

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