

# 2017

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

## Marine Debris Program Accomplishments Report





# Table of Contents

<b>Letter from the Director</b>	<b>3</b>
<b>2017 By the Numbers</b>	<b>4</b>
<b>Marine Debris Program Regions</b>	<b>5</b>
Great Lakes	6
Northeast	7
Mid-Atlantic	8
Southeast	9
Florida & the Caribbean	10
Gulf of Mexico	11
California	12
Pacific Northwest	13
Alaska	14
Hawaii & the Pacific Islands	15
<b>Research</b>	<b>16</b>
<b>Education</b>	<b>18</b>
<b>Looking Ahead</b>	<b>19</b>
<b>Photo Credits</b>	<b>21</b>





# Letter from the Director

Throughout this past fiscal year, the NOAA Marine Debris Program has continued to work toward our vision of the global ocean and its coasts free from the impacts of marine debris. I am proud of what we have accomplished and am excited for the future of our program. Guided by our strategic plan and five program pillars—prevention, removal, research, emergency response, and regional coordination—we have worked to advance our efforts to address marine debris. In just the past year and with the help of many partners, our program has seen the development of several new educational resources, reached thousands of students and teachers with marine debris messaging, removed hundreds of metric tons of debris from our shores and coastal areas, completed several research projects and funded others to expand our knowledge of the marine debris issue, and facilitated the completion of emergency response guides and marine debris action plans for several coastal states.

I look forward to the future as our program continues work to live up to our role as the U.S. federal lead to address marine debris. We will continue these efforts and our work to engage with federal, state, and local governments and agencies; tribes; non-governmental organizations; academia; and industry to tackle marine debris issues, further elevating the importance of this topic throughout the country and globally.

These efforts are important steps toward our ultimate goal of preventing the impacts of marine debris. Although there is still a lot of work to be done to reach that goal, I am proud of the accomplishments we have achieved this year, and am optimistic for the future. I am happy to present the NOAA Marine Debris Program's accomplishments from 2017.

**Nancy Wallace**  
**Director, NOAA Marine Debris Program**






# 2017 By the Numbers




More than  
**1,600 metric tons**  
of marine debris  
removed



**3 Marine Debris  
Emergency Response  
Guides** created for South  
Carolina, Georgia, and  
Mississippi




More than  
**1,800 teachers**  
reached



More than  
**18,300 students**  
reached



**42 new**  
survey sites added  
to the Marine Debris  
Monitoring and  
Assessment Project

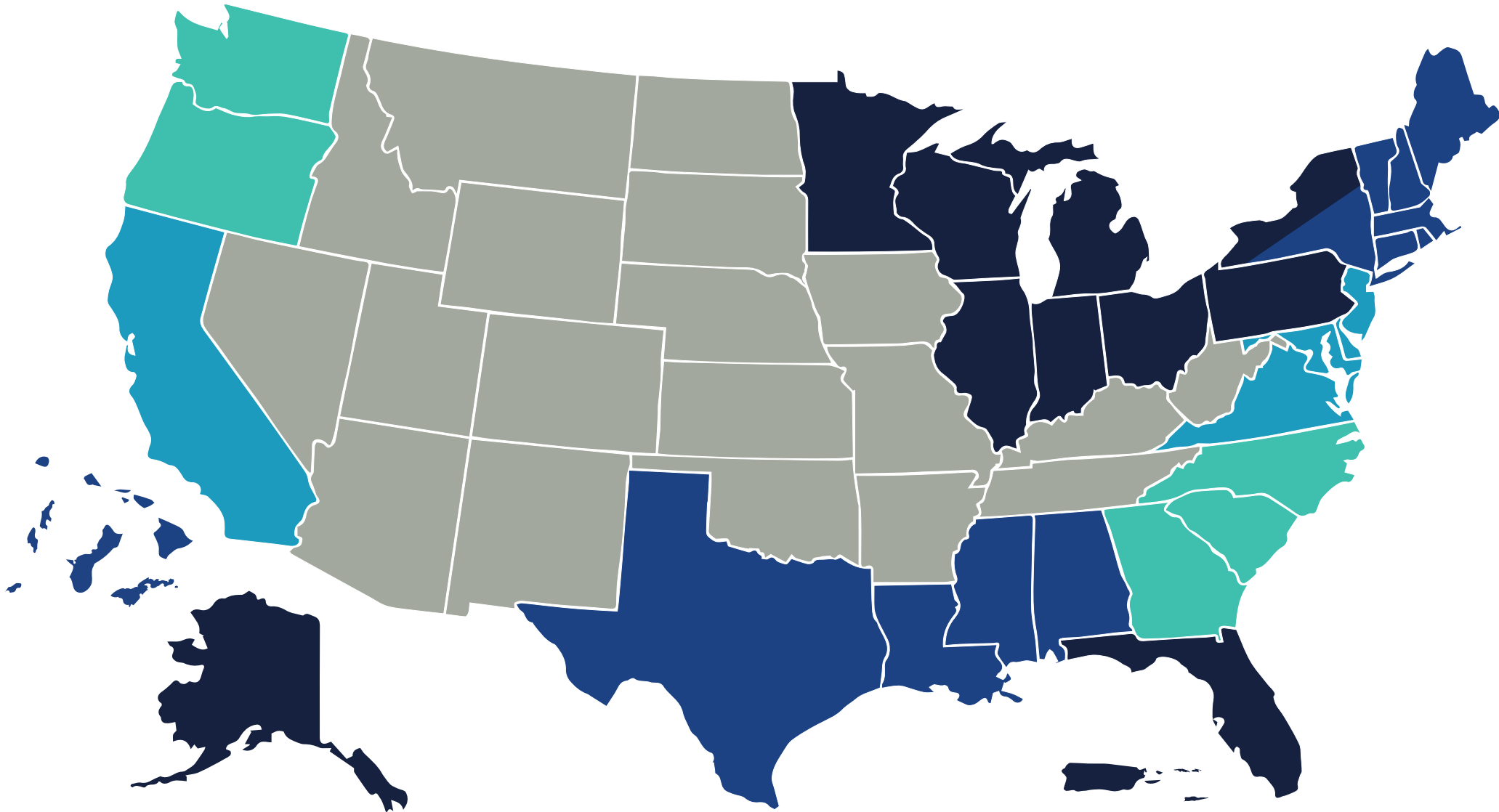


Responded to debris from  
**3 hurricane events:**  
Harvey, Irma, and Maria.



# Marine Debris Program Regions

Marine debris impacts every U.S. coastal state, territory, and the Great Lakes. In order to address it, the NOAA Marine Debris Program (MDP) works around the country to provide local expertise and guidance to marine debris stakeholders, support numerous prevention and removal projects through our competitive grants, and respond to severe marine debris events. There are [ten MDP regions](#) in the coastal U.S. and Great Lakes. Some of this year's most successful efforts within each of the MDP's regions are highlighted in this report.







The [Great Lakes Marine Debris Collaborative](#) was created through the NOAA Office of Response and Restoration DIVER platform as an online space for coordination among marine debris partners. This portal will act as a foundation for all things marine debris in the Great Lakes region, where partners can communicate and share resources, events, and funding opportunities.

## Great Lakes Marine Debris Online Collaboration



Removed a  
**2.3-metric ton**  
derelict sailboat

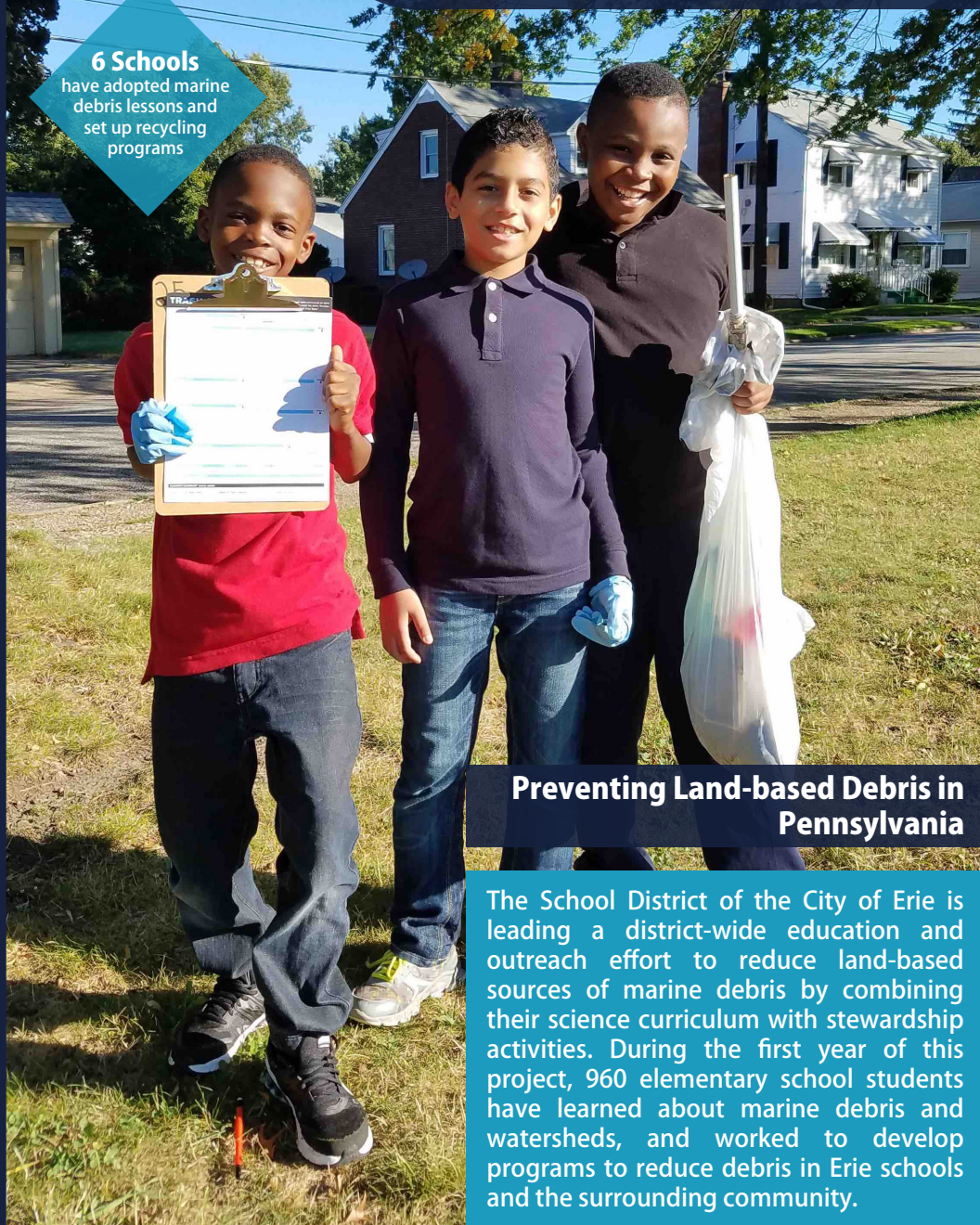
## ADV Removal in Lake Erie

Abandoned and derelict vessels (ADV) can be hazardous to navigation, leach harmful chemicals into the surrounding environment, and damage sensitive habitats. The BoatU.S. Foundation, with the aid of TowBoatU.S. and local marina operators, removed an abandoned and derelict sailboat that was impacting local habitats and species from Lake Erie tributary waters in Toledo, OH.



# Great Lakes

**6 Schools**  
have adopted marine  
debris lessons and  
set up recycling  
programs



## Preventing Land-based Debris in Pennsylvania

The School District of the City of Erie is leading a district-wide education and outreach effort to reduce land-based sources of marine debris by combining their science curriculum with stewardship activities. During the first year of this project, 960 elementary school students have learned about marine debris and watersheds, and worked to develop programs to reduce debris in Erie schools and the surrounding community.



# Northeast



4.5 metric tons  
of fishing gear were  
removed

Over 200  
lobster traps were  
removed

## MISS LILLY

### Fishing for Derelict Gear in Massachusetts

The Center for Coastal Studies worked with commercial and recreational fishermen to locate and remove derelict fishing gear of all kinds from Cape Cod and Massachusetts Bays, retrieving and properly disposing of over 4.5 metric tons of debris.



52 Students  
were engaged  
through marine  
debris lessons

### Inspiring Youth Stewards in NYC

Hudson River Community Sailing worked to inspire high school students in New York City to be stewards of the Hudson Estuary through marine debris lessons, cleanup activities, and the creation of a public educational display.





Over 1,200 derelict crab pots were removed from Barnegat Bay

### Removing Derelict Crab Pots to Reduce Bycatch

The Conserve Wildlife Foundation of New Jersey removed derelict crab pots from Barnegat Bay. They are continuing this work by collaborating with the Marine Academy of Technology and Environmental Science and the fishing community to find and remove derelict pots and collect data on bycatch.



# Mid-Atlantic



1,026 students engaged in cleanups and prevention activities

### Community Leadership to Prevent Urban Debris

In Baltimore, MD, the National Aquarium worked with local communities to learn about resident behaviors that potentially contribute to generation of marine debris, identify barriers to behavior change, and develop messaging techniques to prevent litter and debris. By working to instill debris prevention as a visible community norm and empower community members to lead this effort, the Aquarium aimed to achieve lasting behavior change.

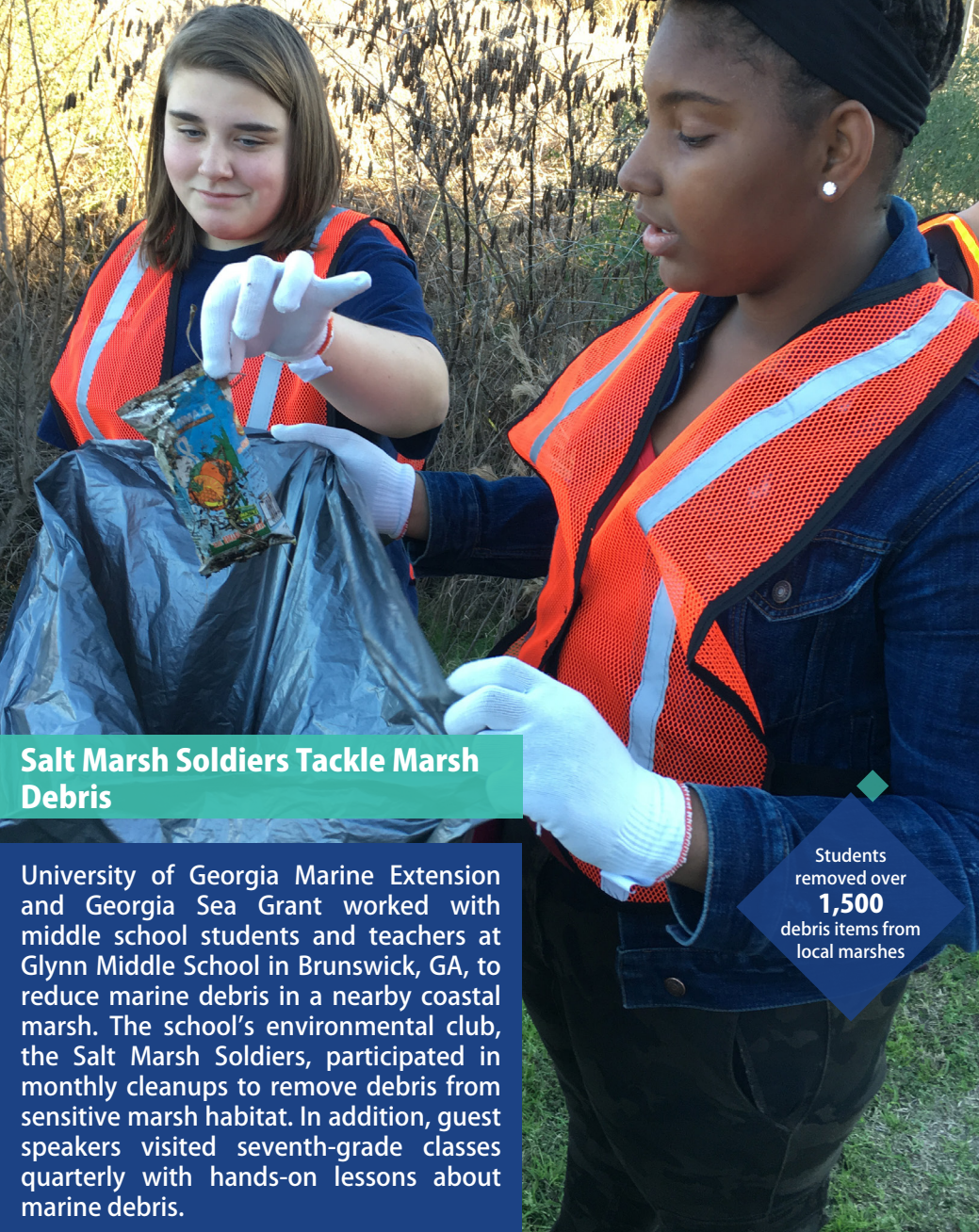


# Southeast



The [South Carolina Incident Waterway Debris Response Guide](#) and the [Georgia Marine Debris Emergency Response Guide](#) were created to improve preparedness for response and recovery operations following an acute waterway debris incident. These guides serve as a comprehensive reference for marine debris emergency response in South Carolina and Georgia.

## Response Guides for the Southeast



### Salt Marsh Soldiers Tackle Marsh Debris

University of Georgia Marine Extension and Georgia Sea Grant worked with middle school students and teachers at Glynn Middle School in Brunswick, GA, to reduce marine debris in a nearby coastal marsh. The school's environmental club, the Salt Marsh Soldiers, participated in monthly cleanups to remove debris from sensitive marsh habitat. In addition, guest speakers visited seventh-grade classes quarterly with hands-on lessons about marine debris.

Students removed over **1,500** debris items from local marshes

**4,304** derelict crab pots were collected across North Carolina

**72** fishermen were hired to remove pots in 2017



### Self-sustaining Derelict Crab Pot Retrieval Program

The North Carolina Coastal Federation worked to expand a fishermen-led crab pot recovery pilot project into a self-sustaining derelict crab pot retrieval program. With funding from the NOAA MDP and the North Carolina General Assembly to support statewide crab pot removals, three times the number of fishermen were hired and four times the number of derelict pots were removed from state waters compared to the prior year.





The Florida Marine Debris Reduction Guidance Plan was created to provide recommended strategies and actions towards reducing the impact and amount of marine debris in Florida. Stakeholders in Florida are already using the Plan to aid in improving the health of Florida's waterways and natural resources, such as coral reefs.

**Florida Marine Debris Reduction Guidance Plan**



**Florida & the Caribbean**



**Community Engagement in Marine Debris Removal**

The Scuba Dogs Society, Inc. recruited over 3,000 local volunteers to remove 36.7 metric tons of marine debris from 998 acres of habitat in Puerto Rico's San Juan Bay Estuary, including large debris such as washing machines, refrigerators, and large car parts. Local communities were empowered to gain the tools and knowledge needed to develop sustainable initiatives that help to prevent litter and marine debris.

**36.7 metric tons** of debris were removed from Puerto Rico's San Juan Bay

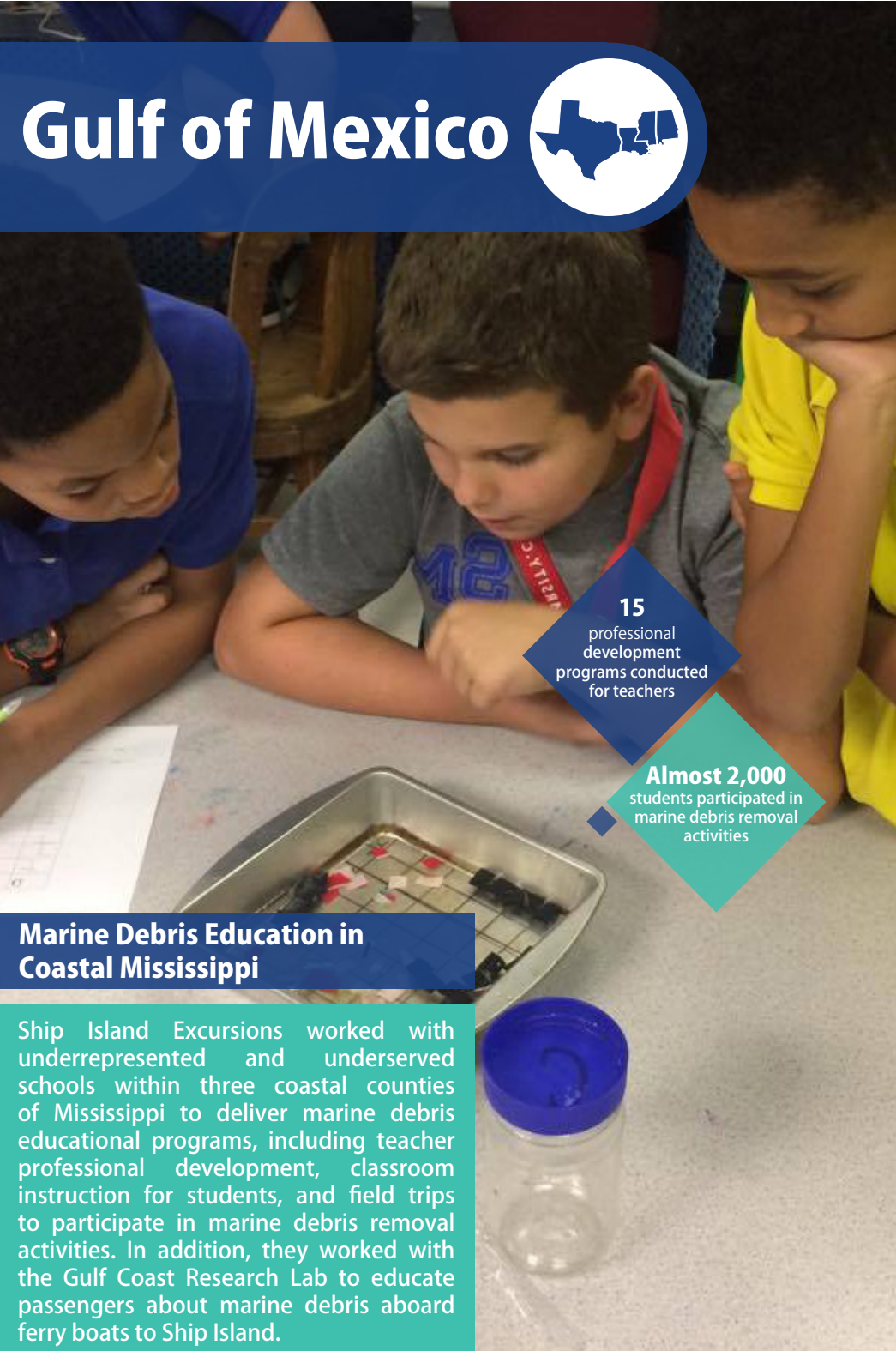
**Over 3,000** volunteers participated in removal and education events

**Using Research for Ecosystem Protection**

The Florida Fish and Wildlife Conservation Commission converted ten years of scientific research on derelict lobster traps into practical knowledge to inform the public and fishing community. This education campaign aimed to change behaviors leading to the reduction of derelict lobster traps and associated debris.



# Gulf of Mexico



## Marine Debris Education in Coastal Mississippi

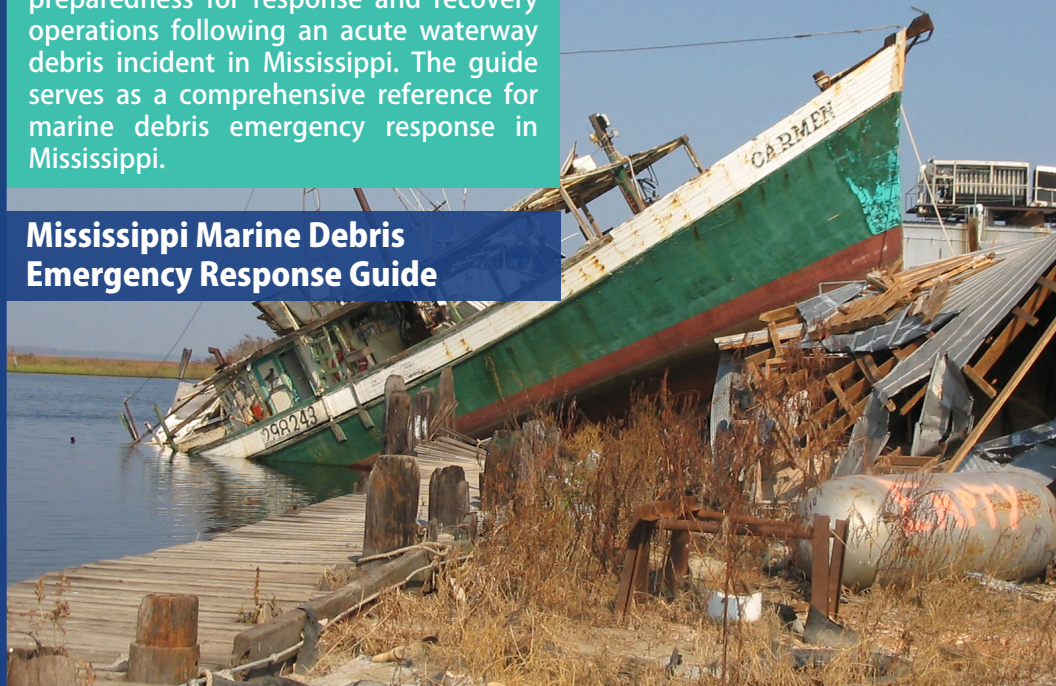
Ship Island Excursions worked with underrepresented and underserved schools within three coastal counties of Mississippi to deliver marine debris educational programs, including teacher professional development, classroom instruction for students, and field trips to participate in marine debris removal activities. In addition, they worked with the Gulf Coast Research Lab to educate passengers about marine debris aboard ferry boats to Ship Island.

**15**  
professional development programs conducted for teachers

**Almost 2,000**  
students participated in marine debris removal activities

The [Mississippi Marine Debris Emergency Response Guide](#) was created to improve preparedness for response and recovery operations following an acute waterway debris incident in Mississippi. The guide serves as a comprehensive reference for marine debris emergency response in Mississippi.

## Mississippi Marine Debris Emergency Response Guide



## Removal to Enhance Galveston Bay Habitat

The Galveston Bay Foundation removed large marine debris items, including abandoned and derelict vessels, from areas of Galveston Bay. This project aimed to enhance marsh and open water habitats for fisheries production, improve water flow, allow safer access to open water areas, and improve the Bay's appearance for all citizens.

**50.8 metric tons**  
of debris were removed from Galveston Bay



Clean Water Fund's ReThink Disposable Project educated the take-out food industry and its customers about the benefits of reducing food and beverage packaging to prevent marine debris and save businesses money. They partnered with over 12 San Francisco Bay Area businesses to conduct audits and identify non-disposable alternatives and strategies to reduce the use of single-use food and beverage packaging.



**Before**



**After**

**65 restaurants**  
engaged in the project

Participating businesses saved an annual average of **\$6,000**



# California



More than **\$46,000** earned by fishermen retrieving gear

More than **750 crab pots** were collected by fishermen

More than **34 metric tons** of debris were removed

## Fisherman-led Dungeness Crab Gear Recovery

The SeaDoc Society at the University of California, Davis, the Humboldt Fishermen's Marketing Association, and the Commercial Fishing Association of Bodega Bay established a port-based, fisherman-led commercial fishing gear recovery and recycling effort on the Northern California Coast. The California Whale Protection & Crab Gear Retrieval Act, signed in September 2016, builds upon this successful pilot project by initiating a state regulatory program with incentives for fishermen to retrieve lost Dungeness crab fishing gear.



# Pacific Northwest

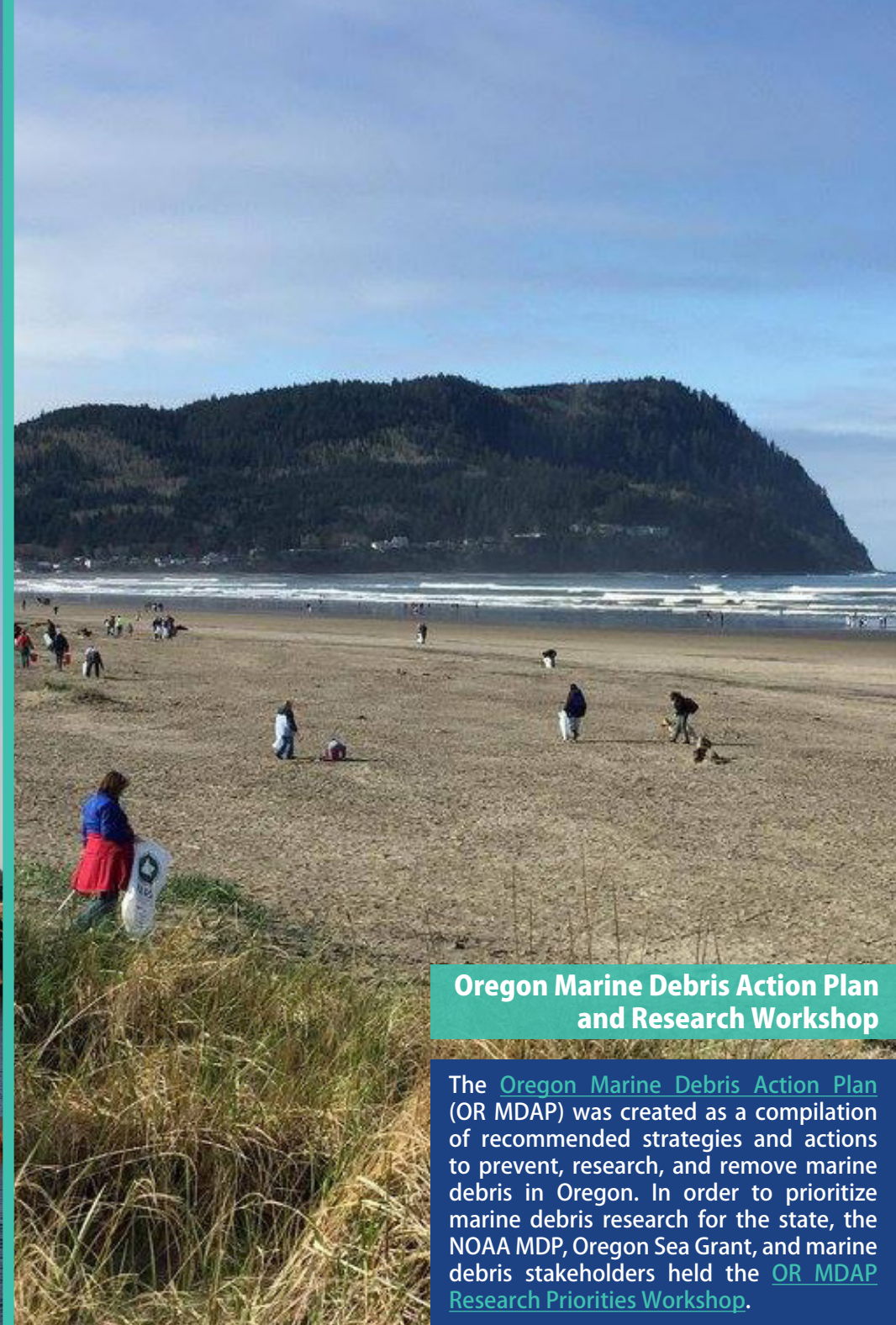


The Task Force removed a **70.8-metric ton** abandoned and derelict vessel



## ADV Task Force in Oregon

In Coos Bay, OR, the Oregon State Marine Board and the Oregon Department of State Lands removed the F/V Western in January 2015. Bi-monthly monitoring for environmental recovery is expected to continue for one year following the vessel's removal. An [ADV Task Force](#) was also initiated to identify strategies to prevent commercial fishing vessels from becoming marine debris and create an inventory of current vessels that need to be removed.



## Oregon Marine Debris Action Plan and Research Workshop

The [Oregon Marine Debris Action Plan](#) (OR MDAP) was created as a compilation of recommended strategies and actions to prevent, research, and remove marine debris in Oregon. In order to prioritize marine debris research for the state, the NOAA MDP, Oregon Sea Grant, and marine debris stakeholders held the [OR MDAP Research Priorities Workshop](#).





**Over 550**  
students participated  
in the zero-waste  
campaign

**11 schools**  
carried out zero-  
waste activities



## Stewards Targeting Ocean Problems (S.T.O.P) Marine Debris

The Center for Alaskan Coastal Studies has worked to educate students and community members on the issue and impacts of marine debris in order to change behaviors and reduce the introduction of debris. Schools from across the Kenai Peninsula and into Anchorage have participated in a zero-waste campaign in which they catalog and measure waste, and design changes tailored to what they discover.



## Derelict Crab Pot Cleanup and Retrieval

In Juneau, AK, the Douglas Indian Association surveyed, mapped, and removed derelict crab pots in the waters off Douglas Island. A post-removal tribal council meeting reflected on lessons learned from the project, the best applications for the data collected, and how to move forward in addressing derelict fishing gear.



# Hawaii & the Pacific Islands



More than **200,000** people reached through the outreach campaign

**78 PSAs** run to engage Maui county residents and tourists

## Tobacco-Free Beaches Public Awareness Campaign

The Pacific Whale Foundation launched a public awareness campaign to inform, educate, and involve the public in marine debris awareness and policy in an effort to reduce the number of cigarette butts found on beaches in Maui, HI. They created educational materials, public service announcements, press releases, and held several small-scale cleanups on public beaches to engage Maui County tourists and residents in the issue of cigarette litter.

The NOAA MDP and University of Hawai'i at Mānoa hosted the first [Hawai'i Marine Debris Action Plan Research Workshop](#) at the University of Hawai'i on O'ahu. The purpose of this workshop was to determine the current state of knowledge, deficiencies, and capacity of stakeholders in the state to further the regional understanding of marine debris.

## Hawai'i Marine Debris Action Plan and Research Workshop



## Creating a Culture of Recycling in Saipan

**20 recycling bins** installed on the island

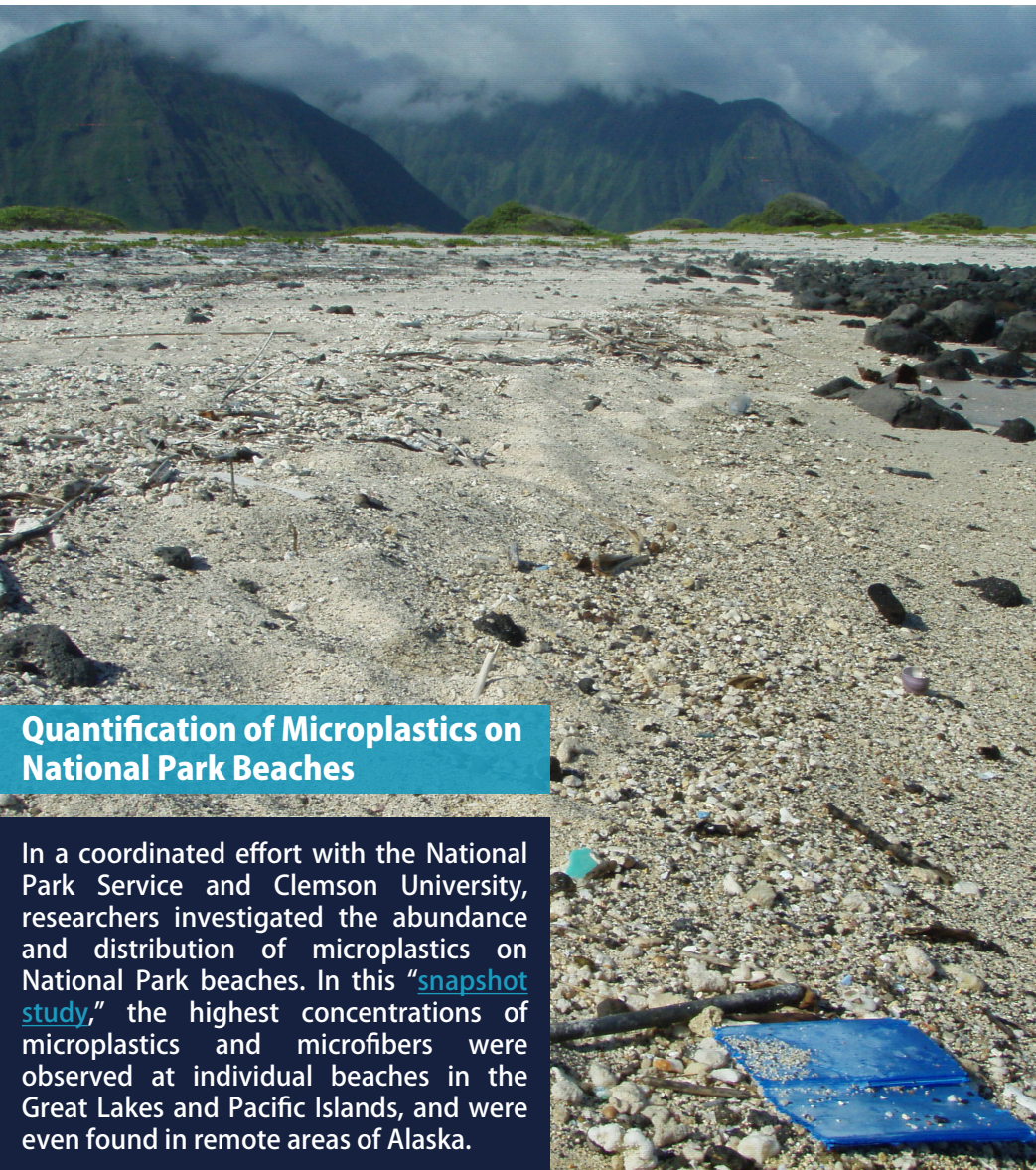
More than **48 metric tons** of waste were collected in the recycling bins

The Mariana Islands Nature Alliance worked to reduce littering and illegal dumping in Saipan by providing mixed-waste and recycling bins, conducting shoreline cleanups, and raising awareness about littering and marine debris through education and outreach. With help from bilingual teachers, they created classroom materials and a film in their native language on local marine debris issues to be used in public classrooms throughout the school year.



# Research

Research into marine debris helps to inform unanswered questions and build our understanding of debris sources, drivers, and impacts. This year saw the completion of marine debris research on the quantification and distribution of marine debris, the cost of marine debris to industry, and the final chapter in a marine debris topic series.



## Quantification of Microplastics on National Park Beaches

In a coordinated effort with the National Park Service and Clemson University, researchers investigated the abundance and distribution of microplastics on National Park beaches. In this "[snapshot study](#)," the highest concentrations of microplastics and microfibers were observed at individual beaches in the Great Lakes and Pacific Islands, and were even found in remote areas of Alaska.



## Effects of Derelict Fishing Gear in the Chesapeake Bay

A team of diverse researchers led by Global Science & Technology, Inc., [completed a study](#) to assess the impact of lost and abandoned crab pots on both wildlife and the economy in the Chesapeake Bay. The study found that by removing derelict pots in active fishing areas, harvest of blue crabs could increase by 23.8 percent (38 million pounds), which translated to \$33.5 million over the study period. A [Guiding Framework](#) was produced for derelict fishing gear assessments, which can be applied to other trap fisheries and/or regions.





Scientists from Texas A&M University Corpus Christi collected water samples from 11 locations along the Mississippi River to quantify and characterize microplastic debris that may eventually flow into the Gulf of Mexico. Once microplastic particles are analyzed, this information will help inform future studies on impacts to aquatic organisms and sources of microplastics in the Gulf of Mexico.

### Microplastics in the Mississippi River



### Status of Marine Debris on U.S. Shorelines

The Ocean Conservancy, together with the Commonwealth Scientific and Industrial Research Organisation (CSIRO), analyzed data sets from their 30-year International Coastal Cleanup (ICC) efforts, as well as five years of data from [NOAA's Marine Debris Monitoring and Assessment Project](#), and the CSIRO marine debris shoreline monitoring protocol. The study estimated that 20 million-1.8 billion pieces of marine debris can be found along the U.S. coast, with plastic fragments and cigarette butts dominating the NOAA and ICC data sets, respectively. In addition, urban population centers had higher debris loads, while states with beverage container legislation had a smaller percentage of beverage container debris.

### Completed Series on Marine Debris Issues

The NOAA MDP completed a series of six topic papers on marine debris issues. This series explores the impacts of marine debris on wildlife from [ghost fishing](#), [ingestion](#), and [entanglement](#), as well as its impacts to [coastal and benthic habitats](#), the [transport of marine debris](#) throughout the ocean, and its potential to carry [invasive species](#).



# Education

Education is an important part of working to prevent marine debris. The NOAA Marine Debris Program works to provide teachers, students, and communities around the country with resources to support marine debris education.

Working with partners in different areas of the country, the MDP made three new curricula available to the public. These curricula, created by [Washed Ashore](#), the [Hawai'i Wildlife Fund](#), and [Nature's Academy](#), all serve to educate students about marine debris and its solutions, and can be adapted for many different classrooms and age levels.

## New Marine Debris Curricula



## Monitoring Toolkit

The Office of National Marine Sanctuaries and the NOAA MDP coordinated to produce the [Marine Debris Monitoring Toolkit for Educators](#), a resource that adapts the MDP's robust citizen science marine debris monitoring program for classroom use.

The MDP's new educator e-newsletter works to keep formal and informal teachers up-to-date with the latest MDP educational resources. Sign up to receive the newsletter on our [website](#).

## Educator Newsletter





# Looking Ahead

The NOAA MDP is looking forward to launching 15 newly-funded removal and research initiatives. Here is a look at the year ahead:

## Removal

### **Island Trails Network**

#### **Kodiak Marine Debris Removal & Monitoring Project.**

Island Trails Network will work with community volunteers and students to remove debris along a stretch of coastline on Northeastern Kodiak Island, AK.

### **Cleveland Metroparks**

#### **Debris Removal at Cleveland Metroparks Euclid Beach Park.**

Cleveland Metroparks will remove concrete slabs and metal from Euclid Beach Park on the shores of Lake Erie and will conduct accompanying volunteer beach cleanups.

### **Mobile Baykeeper Inc.**

#### **Moving Toward a Litter-free Mardi Gras.**

Mobile Baykeeper Inc. will assess, remove, and monitor debris in One Mile Creek, in Mobile, AL, while increasing awareness about the issue with a campaign targeted toward the City of Mobile's Mardi Gras celebration.

### **Cornell Cooperative Extension Association of Suffolk County Central Long Island Sound Derelict Lobster Gear Assessment, Removal and Prevention.**

The Cornell Cooperative Extension Association of Suffolk County will continue their successful and long-running efforts to remove and quantify the extent and distribution of derelict lobster gear by removing derelict gear debris in the New York and Connecticut waters of Long Island Sound.

### **North Carolina Coastal Federation, Inc.**

#### **AquaDebris: Site Restoration and Habitat Recovery Assessment of Shellfish Aquaculture in North Carolina.**

North Carolina Coastal Federation, Inc. will remove aquaculture debris from sensitive coastal habitats near Harkers Island, NC, and develop a set of best management practices for prevention, removal, and disposal of aquaculture debris.

### **The Camden County Municipal Utilities Authority**

#### **Debris Removal to Establish Living Shoreline in Camden, NJ.**

The Camden County Municipal Utilities Authority will remove marine debris, largely in the form of concrete rubble, from the shoreline and surrounding waters of an industrial waste site in the City of Camden, NJ.

### **Save Our Shores**

#### **Hotspot Large-scale Debris Removal from the Monterey Bay National Marine Sanctuary.**

Save Our Shores will organize volunteer cleanups both from land and water to remove debris from three waterways leading into the Monterey Bay National Marine Sanctuary in Monterey, CA, and conduct education programs in schools and outreach with communities adjacent to their target waterways.

### **Pacific Coastal Research & Planning**

#### **Removal of the Derelict Fishing Vessel F/V Lady Carolina from the Reef of the Saipan Lagoon.**

Pacific Coastal Research and Planning will work with a contractor to remove an 83-foot derelict fishing vessel that is grounded in and damaging sensitive coral reef habitat in the Port of Saipan of the Northern Mariana Islands.

### **Makah Indian Tribe of the Makah Indian Reservation**

#### **Removal of Sunken Derelict Vessels from Neah Bay Marina.**

The Makah Indian Tribe of the Makah Indian Reservation will remove three derelict fishing vessels from Neah Bay, WA.

### **County of Prince George**

#### **Trash Removal Project in the Anacostia River Watershed.**

The County of Prince George will install two floating litter traps in the Anacostia River in Maryland to reduce the debris loads flowing downstream towards the Potomac River and eventually the Chesapeake Bay.

### **Conserve Wildlife Foundation of New Jersey, Inc.**

#### **Identification and Retrieval of Derelict Crab Pots to Reduce Bycatch of NOAA Trust Resources in Barnegat Bay, New Jersey: Phase Two.**

Conserve Wildlife Foundation of New Jersey, Inc. will survey, map and remove derelict crab pots in New Jersey's southern coastal bays, building off of the success and lessons learned from a previously-funded NOAA Marine Debris Program grant.

## Research

### **Woods Hole Oceanographic Institute**

#### **Assessment of Plastic Marine Debris Export Mechanisms and Risk to Sea Scallop Fisheries of the Mid-Atlantic Bight.**

Woods Hole Oceanographic Institution will assess the role of seasonal phytoplankton blooms in making microplastics more available to commercially-fished sea scallops, determine rates of ingestion of microplastics and identify subsequent impacts, and determine if microplastics serve as a means of transferring bacterial pathogens to sea scallops. Findings from these experiments will be incorporated into an ecological risk assessment to determine risk to sea scallop stock populations.

### **University of North Carolina at Wilmington**

#### **Microplastic Ingestion in the Black Sea Bass, *Centropristis striata*: An assessment of potential impacts on overall fish health via primary and secondary exposure.**

University of North Carolina at Wilmington will conduct laboratory experiments designed to examine the transfer of microplastics and associated contaminants between prey and predator species and analyze the corresponding impacts to larval and juvenile black sea bass.

### **Arizona State University**

#### **A Screening-level Ecological Risk Assessment for Microplastics in Seafood in American Samoa.**

Arizona State University will use a risk assessment framework to quantify microplastics in water, sediment, and locally-consumed bivalves at three sites in American Samoa, determine the types and concentrations of organic contaminants associated with the microplastics, and estimate relevant toxicological thresholds to assess ecological risk from microplastics

### **University of Connecticut**

#### **Selective Ingestion of Microplastics by Oysters: Exposure assessment as a predictive tool for assessing the environmental risk to commercially important bivalves.**

The University of Connecticut will conduct laboratory studies to determine the effects of microplastic consumption on oysters, and develop a model to predict which types of microplastics are ingested versus rejected by the oysters.





**Innovation. Collaboration. Action.**

**Sixth International Marine Debris Conference (6IMDC)**

NOAA will co-host the 6IMDC, March 12-18, 2018, in San Diego, California. This conference will build upon past successes and share innovative ideas for advancing progress in the areas of marine debris prevention, education, reduction, and research. The 6IMDC will focus on best practices, current research, practical solutions, and opportunities for strengthening partnerships, international cooperation, and cooperation with industry. Sign up to receive updates about the conference at: <http://internationalmarinedebrisconference.org/>



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13. Hudson River Community Sailing (Right, Page 7)
14. Emily Heiser (Left, Page 8)
15. Pat Venturino (Right, Page 8)
16. University of Georgia (Left, Page 9)
17. Peter Kingsley-Smith, South Carolina Department of Natural Resources (Top Right, Page 9)
18. North Carolina Coastal Federation (Bottom Right, Page 9)
19. Jennifer L. McGee (Top Left, Page 10)
20. Scuba Dogs Society (Bottom Left, Page 10)
21. Florida Fish and Wildlife Conservation Commission (Right, Page 10)
22. Hanna Miller, University of Southern Mississippi (Left, Page 11)
23. NOAA (Top Right, Page 11)
24. Galveston Bay Foundation (Bottom Right, Page 11)
25. Clean Water Fund (Left, Page 12)
26. SeaDoc Society (Right, Page 12)
27. Oregon Sea Grant (Left, Page 13)
28. SOLVE (Right, Page 13)
29. Center for Alaskan Coastal Studies (Left, Page 14)
30. Douglas Indian Association (Right, Page 14)
31. Pacific Whale Foundation (Left, Page 15)
32. NOAA (Top Right, Page 15)
33. Mariana Islands Nature Alliance (Bottom Right, Page 15)
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42. NOAA (Page 20)
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# NOAA Marine Debris Program

Office of Response and Restoration

National Ocean Service

October 2017

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