REPORT TO CONGRESS

2016-2017 Interagency Marine Debris Coordinating Committee Biennial Report

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Developed pursuant to: Marine Debris Act of 2006

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THIS INTERAGENCY MARINE DEBRIS COORDINATING COMMITTEE PROGRESS REPORT IS PROVIDED PURSUANT TO THE MARINE DEBRIS ACT (33 U.S.C. §1951 *et seq*.). SECTION 1954(e) OF THE ACT REQUIRES:

(e) Biennial Progress Reports. Biennially, the Committee, through the Chairperson, shall submit to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Transportation and Infrastructure and the Committee on Natural Resources of the House of Representatives a report that evaluates United States and international progress in meeting the purpose of this chapter. The report shall include—

(1) the status of implementation of any recommendations and strategies of the Committee and analysis of their effectiveness;

(2) a summary of the marine debris inventory to be maintained by the National Oceanic and Atmospheric Administration;

(3) a review of the National Oceanic and Atmospheric Administration program authorized by section 1952 of this title, including projects funded and accomplishments relating to reduction and prevention of marine debris;

(4) a review of Coast Guard programs and accomplishments relating to marine debris removal, including enforcement and compliance with MARPOL requirements; and

(5) estimated Federal and non-Federal funding provided for marine debris and recommendations for priority funding needs.

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Department of the Interior, United States Fish and Wildlife Service

Department of Justice, Environment and Natural Resources Division

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Marine Mammal Commission

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1.0 Executive Summary

This Interagency Marine Debris Coordinating Committee (IMDCC) Progress Report provides an update on the activities Federal agencies have undertaken between January 2016 and December 2017 to address marine debris, as mandated by the Marine Debris Act (Act), 33 U.S.C. § 1951 *et seq*. The Act requires IMDCC to submit biennial progress reports that evaluate the United States' and international community's progress in meeting the purposes of the Act.

This is the fifth progress report since the publication of the first Interagency Report on Marine Debris Sources, Impacts, Strategies, and Recommendations, submitted to Congress in August 2008. This progress report contains all of the information required by 33 U.S.C. § 1954(e) of the Act, entitled "Biennial Progress Reports", including the following:

- Section 3.0: the status of implementation of any recommendations and strategies of the Interagency Committee and analysis of their effectiveness;

- Section 4.0: a summary of the marine debris inventory to be maintained by the National Oceanic and Atmospheric Administration (NOAA);

- Section 5.0: a review of the NOAA Marine Debris Program (MDP), including projects funded and accomplishments relating to reduction and prevention of marine debris;

- Section 6.0: a review of U.S. Coast Guard programs and accomplishments relating to marine debris removal, including enforcement and compliance with International Convention for the Prevention of Pollution from Ships (MARPOL) requirements; and

- Section 7.0: estimated Federal and non-Federal funding provided for marine debris.

The appendices contain an overview of IMDCC, relevant Federal agency authorities, and projects funded by the MDP.

2.0 Introduction

2.1 Overview of the Marine Debris Issue

Marine debris is one of the most pervasive global threats to the health of the ocean and our waterways and is an issue of growing local, regional, national, and international concern. Marine debris can injure or kill marine and coastal wildlife, damage and degrade habitats, interfere with navigational safety, cause economic loss to fishing and maritime industries, and coastal communities, and threaten human health and safety.

Marine debris is defined as "…any persistent solid material that is manufactured or processed and directly or indirectly, intentionally or unintentionally, disposed of or abandoned into the marine environment or Great Lakes."[1] Anything man-made – such as vessels, fishing gear, plastic bags, beverage bottles, and food wrappers – can become marine debris through dumping, improper waste management, transport through storm drains, and extreme natural events.

Major marine debris events caused by natural disasters, such as the 2011 Tohoku earthquake and tsunami in Japan, and the 2017 Hurricanes Harvey, Irma and Maria in the Gulf of Mexico, Caribbean, and Southeastern U.S., have brought national and international attention to the marine debris issue. While these extreme events call attention to the issue, there is also an increasing recognition that marine debris is a persistent, everyday problem.

Plastics, one of the most pervasive types of marine debris, are drawing increasing public concern. Plastic items are used in many aspects of daily life. Unfortunately, as society develops new uses for them, the variety and quantity of plastics in the marine environment also increase dramatically. Plastics are a very visible part of the marine debris problem, but many of their marine impacts are only starting to be understood. Research has revealed that most commonly used plastics, once in the marine environment, do not completely degrade into organic and inorganic molecules. Instead, they break into smaller and smaller pieces. When plastics are less than 5 mm, they are called microplastics.

Research has also shown that plastic debris is a potential vector for the transfer of persistent, bioaccumulative, and toxic pollutants (PBT) from the water to the food web, potentially creating a risk to marine species and human health.[2] Questions such as the potential impacts of PBTs on ocean health are propelling new research on marine plastics.

A second highly visible and concerning form of marine debris is derelict fishing gear (DFG). It adversely impacts the marine environment by: damaging marine habitats, entangling marine species including seabirds and marine mammals, creating hazards to navigation, and "ghost

[1] Marine Debris Act, 33 U.S.C. § 1956 (2012).

[2] Rochman, C. M., Hoh, E., Kurobe, T., & Teh, Swee J. (2013). Ingested Plastic Transfers Hazardous Chemicals to Fish and Induces Hepatic Stress. *Nature, Scientific Reports 3,* 3263. doi:10.1038/srep03263

fishing" for commercially important species, resulting in lost catch opportunities and economic losses for fishermen.[3]

Abandoned and derelict vessels (ADV) are a third highly visible and prevalent type of marine debris, with thousands of ADVs littering our Nation's coastal waters. ADVs threaten our ocean, coasts, and waterways by obstructing navigational channels, causing harm to the environment, and diminishing commercial and recreational activities.

From consumer items to ADVs, marine debris is polluting the global ocean. The problem is substantial, but it is not unsolvable. Marine debris is preventable by increasing awareness of the problem, changing individuals' behaviors, and improving waste-handling infrastructure.

The Federal Government has recognized that marine debris can be dealt with effectively through a comprehensive approach that is local in scale, global in scope, directed at source prevention, and designed to both educate and empower communities to take action.[4] IMDCC is a multiagency body tasked with ensuring that this comprehensive approach is implemented to address marine debris.

On October 11, 2018, President Trump signed the Save Our Seas Act of 2018 into law. Title I of the Act amends and reauthorizes the Marine Debris Act to 2022, promotes international action to reduce the incidence of marine debris, authorizes marine debris cleanup and response actions, and updates the membership of the Interagency Marine Debris Coordinating Committee. The next Progress Report will address the Save Our Seas Act of 2018 and its application to the IMDCC.

2.2 The Interagency Marine Debris Coordinating Committee

IMDCC was established by Congress under the Marine Plastic Pollution Research and Control Act of 1987 (MPPRCA) and was re-established under the Marine Debris Act.[4] IMDCC is the interagency coordinating body responsible for addressing marine debris. IMDCC is made up of the following Federal agencies:

- ➢ Department of Commerce, National Oceanic and Atmospheric Administration (NOAA) – Chair;
- ➢ United States Environmental Protection Agency (EPA) – Vice-Chair;
- ➢ Department of Defense, United States Army Corps of Engineers (USACE);
- ➢ Department of Defense, United States Navy (Navy);
- ➢ Department of Homeland Security, United States Coast Guard (USCG);
- ➢ Department of the Interior, Bureau of Safety and Environmental Enforcement (BSEE);
- ➢ Department of the Interior, National Park Service (NPS);
- ➢ Department of the Interior, United States Fish and Wildlife Service (USFWS);

[3] The term "ghost fishing" is defined as "the ability of fishing gear to continue fishing after all control of that gear is lost by the fisherman." Smolowitz, R. J., Corps, L. N., and Center, N. F. (1978). Lobster, Homarus americanus, trap design and ghost fishing. Marine Fisheries Review 40, 2–8.

[4] National Oceanic and Atmospheric Administration (2008). *Interagency Report on Marine Debris Sources, Impacts, Strategies & Recommendations*.

[4] Marine Debris Act, 33 U.S.C. § 1951 *et seq*. (2006), as amended by Title VI of Pub. L. No. 112-213.

- ➢ Department of Justice, Environment and Natural Resources Division (DOJ);
- ➢ Department of State, Office of Ocean and Polar Affairs (DOS); and
- ➢ Marine Mammal Commission (MMC)

IMDCC is primarily responsible for sharing information, assessing and implementing best management practices, and coordinating interagency responses to everyday marine debris and severe marine debris events. IMDCC ensures coordination of Federal agency research priorities, monitoring techniques, educational programs, and regulatory actions. IMDCC is also responsible for recommending priorities and strategies, both nationally and internationally, to identify, determine sources of, assess, reduce, and prevent marine debris, and mitigate the adverse impact on the marine environment, natural resources, and vessels.

In 2008, IMDCC developed a report titled, *Interagency Report on Marine Debris Sources, Impacts, Strategies, and Recommendations*, which was written in response to a Congressional charge to submit to Congress a report that identifies the sources of marine debris; the ecological and economic impacts of marine debris; alternatives for reducing, mitigating, preventing, and controlling the harmful effects of marine debris; the social and economic costs and benefits of such alternatives; and recommendations to reduce marine debris both domestically and internationally. The 2008 report presented recommendations to guide the Federal Government's strategies with respect to the problems of persistent marine debris.

This report, like the four previous biennial IMDCC reports to Congress, provides status updates on IMDCC Federal agency partner activities to implement the 2008 report recommendations. This report also addresses the reporting requirements outlined in the Marine Debris Act which includes: a summary of the marine debris inventory to be maintained by NOAA; a review of the NOAA Marine Debris Program (MDP) authorized by Section 3 of the Marine Debris Act, including projects funded and accomplishments relating to reduction and prevention of marine debris; a review of the USCG program and accomplishments relating to marine debris removal, including enforcement and compliance with MARPOL requirements; and estimated Federal and non-Federal funding provided for marine debris.

In the 2 years since the previous report, IMDCC has worked to address the recommendations of the 2008 report, focusing on coordinating efforts on marine debris prevention, research and monitoring, and removal. IMDCC has also addressed emergent marine debris issues including evaluating economic costs of marine debris, emergency response planning, potential marine debris impacts of opening arctic shipping routes, and region specific marine debris issues and efforts. In addition, as attention to the issue of marine debris has increased, IMDCC and its member agencies have increasingly become engaged in international coordination.

3.0 Implementation of IMDCC recommendations and strategies

The 2008 "*Interagency Report on Marine Debris Sources, Impacts, Strategies, and Recommendations*" provided a detailed review of the problems associated with marine debris and laid out 25 recommendations intended to guide the Federal Government's strategies with respect to the problems of persistent marine debris. The recommendations were categorized into eight overarching topics: Education and Outreach, Legislation/Regulation/Policy, Incentive Programs, Enforcement, Cleanups, Research, Technology Development, and Fostering Coordination. The following section includes the 2008 report recommendations and progress by IMDCC agencies since the last report for each topic area.

3.1 Status of Activities Related to IMDCC Recommendations

Education and Outreach

2008 Report Recommendations

- ➢ Federal agencies should demonstrate leadership by distributing educational materials to personnel on the sources and impacts of marine debris, as well as methods for prevention, with the goal of reducing the Federal contribution to marine debris.

- ➢ Federal agencies should support public awareness campaigns by providing technical expertise and educational materials and by encouraging private sector participation, when appropriate. These campaigns may target specific threats and audiences to address the diversity of the marine debris issue.

- ➢ Federal agencies should engage and partner with state, local, tribal, and non-governmental entities to support coordinated events, such as Earth Day, the International Coastal Cleanup (ICC), and other activities that have relevance to marine debris. These events should include nationwide educational and media outreach efforts to enhance awareness of sources and impacts of marine debris and provide recommendations regarding specific actions that can be taken to prevent or reduce marine debris.

NOAA Marine Debris Program

In fiscal year (FY) 2016, the National Oceanic and Atmospheric Administration (NOAA) Marine Debris Program (MDP) funded 12 cooperative agreements through the NOAA Marine Debris Prevention grant program. This funding opportunity was not subsequently offered in FY 2017 in order to make room for the NOAA Marine Debris Research grant competition. Through these projects, the MDP partnered with Federal, state, local agencies, and non-governmental organizations (NGO) to educate the public about marine debris in order to prevent it from entering the marine environment. In addition to the prevention grants, the MDP conducted direct education and outreach across the country through activities and tools including: an annual K-8th grade art contest, educational displays in visitor centers, outreach to school children and teachers, stakeholder workshops, a monthly newsletter, and a robust web presence incorporating social media and a dedicated blog. In FY17, MDP launched its first quarterly Educator Newsletter targeted to teachers. The MDP, along with other NOAA offices and outside partners, works to directly engage students and teachers by supplying educational materials for both formal and

informal environments. MDP staff members, located around the country, visit classrooms to provide marine debris educational programming.

The MDP has developed a robust education and outreach initiative to inform the public about the causes and impacts of marine debris and to facilitate attitude and behavior changes that result in the prevention and reduction of marine debris. It conducts education and outreach directly with the public and through partners. To increase public awareness, the MDP maintains an active blog and provides regular web stories to its website. In FY 2016, the MDP published 51 web stories and 115 blog posts. In FY 2017, the MDP published 61 web stories and 105 blog posts. For more information, please see the MDP's education and outreach priorities in Section 5.2.

U.S. Environmental Protection Agency

Land-based sources account for a majority of trash in the ocean and coastal environments. The U.S. Environmental Protection Agency (EPA) has established the national Trash Free Waters (TFW) program to encourage collaborative actions by public and private stakeholders to prevent trash from entering water. The EPA provides information online to inform the public about trash-free waters and marine debris, and to provide information on actions that the public can take to reduce the loadings of trash and debris into U.S. waterways. The national EPA TFW website (https://www.epa.gov/trash-free-waters) provides extensive information on EPA's TFW program. Additionally, the tri-annual Flow newsletter (https://www.epa.gov/trash-free-waters/newsletter-flow-trash-free-waters) is sent to more and more subscribers. The Flow details a handful of local, state, regional, and international TFW efforts that have been successful, so that others may identify opportunities to replicate approaches.

EPA's TFW program has initiated a process to analyze and address factors that limit the success of numerous education and outreach programs seeking to prevent littering and improper trash disposal. EPA will work with communication experts in government and the private sector to develop strategies that combine innovative messaging with targeted actions to define the next generation of behavior modification strategies for trash prevention.

EPA's TFW team is working with states and other Federal agencies in the Mid-Atlantic Region, where community-based behavior change campaigns were identified as a priority by multiple stakeholders. Moving forward, EPA is providing input on the development of the Mid-Atlantic Regional Planning Body's Healthy Ocean Indicators. These metrics will relate to the effectiveness of efforts to reduce marine debris, especially tracking success of education campaigns.

In 2017, EPA's TFW program produced a series of webinars with experts on microplastic pollution. The eight webinars were accessible to all levels of the general public, with many classrooms participating in the live presentations. EPA organized the presentations in a clear way and, by partnering with leading scientists, developed relationships for better science communication.

U.S. Navy

The U.S. Navy has developed fleet training aides to instruct sailors on the proper handling of solid wastes and the correct operation and maintenance of waste handling equipment. In addition, the Navy engages the public regularly with its "Stewards of the Sea" environmental outreach program. Events include Fleet Weeks, Navy Weeks and Air Shows, as well as displays at environmental seminars and other venues. As part of the environmental outreach program, the Navy has handouts and informational material available for distribution to the public, and subject matter experts available to discuss Navy at-sea waste disposal procedures in conformity with the Act to Prevent Pollution from Ships, including separation and processing of all plastic waste at sea, and retention of plastic waste aboard ship until it is able to be properly disposed of ashore.

U.S. Coast Guard

During the 2016-2017 reporting period, the U.S. Coast Guard (USCG) continued efforts to demonstrate leadership within the service by hosting Headquarters-level workshops on its in-house pollution prevention, waste reduction, and recycling programs. These programs help reduce the impacts of land-based sources (e.g., landfill) of marine debris, focusing on reduction of single-use plastic disposables and packaging for food service.

Additionally, the USCG supports public awareness of pollution impacts, including marine debris and plastics in the ocean, through its Sea Partners Campaign programs and local level distribution of education and outreach materials through the USCG Auxiliary. The USCG continues to work with the North American Marine Environment Protection Association (NAMEPA) under a 2012 MOU to assist in producing specific marine safety and pollution prevention outreach materials that NAMEPA distributes through the USCG Auxiliary.

The USCG engages with state, local, and NGO entities at the district and sector levels, participating in harbor safety and pollution prevention efforts around the country.

Bureau of Safety and Environmental Enforcement

The Bureau of Safety and Environmental Enforcement (BSEE) Marine Trash & Debris Program requires annual training of all workers employed or contracted by oil and gas operators in the offshore Gulf of Mexico. The training highlights the problems caused by marine debris and explains required protocols that workers must follow to prevent loss of debris into the marine environment. In 2016-17, the BSEE produced a new training video which is now publicly available on its website (https://www.bsee.gov/debris). The BSEE also distributes NOAA wallpaper/screen saver images and produced a flyer in 2016 to inform offshore oil industry representatives.

National Park Service

The National Park System includes 88 parks on the ocean and Great Lakes with more than 11,000 miles of shoreline and 2.5 million acres of coastal waters, across 22 states and four territories. These parks attract more than 94 million recreational visits per year. The National Park Service (NPS) has developed and posted interpretive material related to marine debris (e.g., see ocean plastics (https://www.nps.gov/subjects/oceans/ocean-plastics.htm) and management issues (https://www.nps.gov/subjects/aknatureandscience/marinedebris.htm)). Additionally, NPS educates and engages the public through sponsored cleanups during the annual ICC and

National Public Lands Day, or on other dates in collaboration with other agencies, local nonprofit organizations, and park partner associations. Thousands of volunteers remove many tons of debris from park shorelines each year. Participants may utilize the NOAA Marine Debris Monitoring and Assessment Project (MDMAP) protocols, or other protocols and guidance, to record information on amounts and types of marine debris they collect. During the process, they learn about the impacts of marine debris and contribute to the monitoring and assessment of debris on park shorelines.

U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service (USFWS) provides education and outreach opportunities to the public in a variety of ways. At the local level, marine debris issues are presented through interpretive panels and talks, and fishing line recycling stations in National Wildlife Refuges. At the regional and national levels, marine debris cleanup and prevention are frequent topics for blog posts and articles shared through social media.

Department of State

DOS sponsored a renowned American marine debris expert, Dr. Jenna Jambeck of the University of Georgia, as a U.S. Embassy Speaker. With Embassy support, Dr. Jambeck met in 2017 with students, academia, civil society, and government officials in South Africa, Japan, Vietnam, Philippines, and Indonesia. The DOS supported a 2016 initiative from Embassy Copenhagen for an exhibit traveling throughout Europe to showcase the environmental impact of marine plastic pollution. This exhibit toured multiple cities in Europe before ending in Naples, Italy, during the 2017 G7 Environmental Ministerial Meeting. In addition, U.S. Embassy Public Affairs sections regularly conduct outreach events to educate the host country's public on marine plastic pollution, including public viewings of documentaries and discussions.

Marine Mammal Commission

The Marine Mammal Commission (MMC) conducted outreach with local middle and high schools in 2016. These outreach events included sharing information about threats to marine mammals, with an emphasis on entanglements in marine debris.

Each year the MMC hosts an Annual Meeting in a different region in order to focus on region-specific marine mammal topics. These meetings are open to the public and serve as a strong outreach tool for raising awareness of local issues. In 2017, MMC's Annual Meeting was held in North Falmouth, Massachusetts and focused largely on the entanglements of North Atlantic Right Whales in active and derelict fishing gear, and also on recovering populations of seals. There was strong public attendance from the commercial and recreational fishing industries, as well as other Federal agencies, NGOs, and science organizations, with over 100 people attending the sessions.

Legislation / Regulation / Policy

2008 Report Recommendations

- ➢ IMDCC should review the findings from the National Academy of Sciences study that will assess the effectiveness of international and national measures to prevent and reduce marine debris and its impacts, and Federal agencies should take action, as appropriate.

- ➢ Federal agencies should seek ways to strengthen and enhance their ability to fulfill both regulatory and non-regulatory mandates for marine debris prevention, where appropriate. Table 2, which lists Federal marine debris related authorities, may be used for review and assessment of existing authorities.

- ➢ IMDCC should coordinate a correspondence group of state, local, and tribal governments to determine the marine debris-related authorities and policies at those levels, including both those that address land-based sources of marine debris and those that address ocean-based sources. The correspondence group will be an important component in IMDCC's gap analysis of regulatory and non-regulatory authorities that can be used to promote marine debris prevention.

- ➢ Federal agencies, coordinating through IMDCC, should review existing international policies and strategies regarding marine debris from both land-based and ocean-based sources, and develop a white paper outlining possible policies or actions for consideration by the United States.

NOAA Marine Debris Program

MDP works with state and local governments to identify authorities and policies addressing derelict fishing gear and ADVs. The removal of both DFG and ADVs often falls under state policies which can vary greatly state-by-state. To better understand the state regulations addressing the removal of DFG across the country the MDP, in partnership with the Sea Grant Law Center at the University of Mississippi through a '*Fishing for Energy'* grant, initiated a review of the legal frameworks governing the placement and removal of fishing gear in 11 states. For the priority states, the National Sea Grant Law Center analyzed the compiled laws and regulations to address several key management questions identified by the project Advisory Committee. It also addressed the following: state definitions for DFG, requirements for marking gear and attending gear, prohibitions on "molesting" gear, requirements or authorizations to remove gear, closed periods for gear removal, and other relevant definitions for derelict or abandoned property. The report was finalized in 2016 and is available on the Sea Grant Law Center's website (http://nsglc.olemiss.edu/projects/dfg/index.html).

In 2016 and 2017, the North Carolina Coastal Federation (NCCF) broadened the MDP funded, fishermen-led crab pot recovery pilot project into a self-sustaining derelict crab pot retrieval program. NCCF coordinated with the North Carolina Division of Marine Fisheries Marine Patrol (NC Marine Patrol), North Carolina Sea Grant, and commercial fishermen to implement the crab pot removal program. Since 2016, NCCF has hired fishermen to locate, document, and remove any crab pots found during the closed season.

A key component of this project was to make this fishermen-led effort a long-term, sustainable one. In 2017, the project received $100,000 from the North Carolina General Assembly to support statewide expansion of its work. With the state's funding support, NCCF was able to hire three times the number of fishermen, who removed over four times the number of crab pots than in previous years, thus improving essential fish habitat, reducing ghost fishing, preventing navigational hazards, and providing jobs to commercials crabbers during the closed season.

ADVs negatively impact marine waterways and communities and present a challenge to state and local coastal managers. In an effort to clarify the roles of Federal agencies in addressing ADVs, state laws and regulations, and state ADV programs, MDP launched ADV InfoHub in November 2015. During 2016 and 2017, ADV InfoHub provided relevant information with Federal, state, and local partners; the Canadian Coast Guard has also used InfoHub as they form a Canada-wide program to address ADVs. In 2016, MDP funded the successful removal of a derelict vessel in Coos Bay, Oregon. Similarly, in 2017, MDP funded the Makah Tribe to remove three ADVs in the Makah Marina, Neah Bay, Washington. There have also been several changes in state laws addressing ADVs including a new law in Alabama that creates a means for lawful removal of ADVs, makes it illegal for someone to refuse or fail to remove their derelict boat from waters within the state, and also sets up a state ADV fund.

U.S. Environmental Protection Agency

EPA has a unique capacity, as a national regulatory agency with ten regional offices and programs ranging from ocean and coastal protection to solid waste and stormwater management, to address trash in waters and marine debris at the source, as it moves through the watershed, and as it settles in the marine environment. EPA identified prevention of land-based sources entering waters as the primary theme for its TFW Program. Additionally, EPA focuses on maximizing the agency's ability to fulfill both regulatory and non-regulatory mandates for aquatic trash/marine debris prevention through its Offices of: 1) Resource Conservation and Recovery; 2) Wastewater Management; 3) Pollution Prevention and Toxics; 4) Solid Waste; 5) International and Tribal Affairs; 6) Research and Development; and 7) Wetlands, Oceans, and Watersheds.

A number of statutory and regulatory tools exist at the Federal, state, and municipal levels to explicitly limit the amount of trash that enters aquatic ecosystems. Within EPA's statutory authorities, Municipal Separate Storm Sewer (MS4) permits can be written to set standards for trash being released from storm water outfalls into municipal rivers and streams. In addition, a small number of municipal jurisdictions have set Total Maximum Daily Load (TMDL) limits for trash entering water bodies, as a means of complying with state and regional water quality standards. EPA is also currently developing a compendium which will provide MS4 permit writers with critical information to help them articulate more effective trash provisions in permits and ultimately help municipalities to better mitigate trash flows through their stormwater management programs.

U.S. Navy

During 2016 and 2017, the Navy began the process of upgrading the fleet's large pulpers to improve performance and facilitate ease of maintenance. Similar planned upgrades to shipboard plastic waste processing equipment are under development. The Navy also conducted investigations of technologies including compaction, conversion, and thermal destruction to enable warships to achieve zero discharge of metal, paper, and cardboard waste in accordance with new domestic and international discharge regulations.

U.S. Coast Guard

During the 2016-2017 reporting period, the USCG continued to review and assess its role in development of international regulatory schemes and in implementing those regulations in our

national legislation and regulatory framework. The United States is party to MARPOL as implemented in the Act to Prevention Pollution from Ships (APPS, 33 U.S.C. 1901 *et seq*.). The USCG continues to assess the effectiveness of its MARPOL programs and mandates on reducing marine debris from ships in compliance with near zero discharge restriction imposed by MARPOL under U.S. regulations.

Bureau of Safety and Environmental Enforcement

The BSEE Marine Trash & Debris Program establishes policies and procedures based on regulations (30 CFR 250.300) governing compliance of offshore oil and gas operators in the Gulf of Mexico. These policies include annual training for offshore workers, visible signage on offshore structures, and annual reporting requirements. In addition, BSEE regulations require operators to remove structures, equipment, and obstructions on leases and within easements and rights-of-way following cessation of operations. A total of 5,067 structures have been removed over the history of the offshore program since 1973, with 200 removed in 2016, and 108 removed in 2017.

National Park Service

NPS has authority to address marine debris impacts and sources under the NPS Organic Act of 1916 (as amended and supplemented), which directs the NPS to conserve the scenery, natural and historic objects, and wildlife of National Parks unimpaired for the enjoyment of future generations. NPS regulations (36 CFR § 2.14) prohibit disposing of refuse other than in refuse receptacles. *NPS Management Policies 2006*, § 9.1.6.1, Waste Management, states: "The Service will implement solid and hazardous waste management practices that integrate waste reduction, reuse, and recycling programs to minimize the generation and disposal of solid and hazardous waste at and from NPS sites. The NPS will require the use of biodegradable materials, the reuse and recycling of materials, and other appropriate measures to minimize solid waste and conserve natural resources to the fullest extent possible. Innovation in the use of recyclable or reusable materials is encouraged. For example, the service may encourage the remanufacturing of recyclable materials into acceptable sales items for willing markets, including the Park Service." Individual parks may publish rules under the Superintendent's Compendium that control refuse and waste disposal and recycling. In addition, NPS includes provisions in contracts for commercial visitor services to reduce, recycle, or properly dispose of waste products.

U.S. Fish and Wildlife Service

In 2016, the USFWS Deputy Director Jim Kurth provided testimony for an oversight hearing to the Senate Environment and Public Works Subcommittee on Fisheries, Water, and Wildlife. The hearing was entitled, "Marine Debris and Wildlife: Impacts, Sources, and Solutions." Mr. Kurth's testimony focused on the USFWS's role in addressing the threat of marine debris. The testimony is available at: https://www.gpo.gov/fdsys/pkg/CHRG-114shrg22168/pdf/CHRG-114shrg22168.pdf.

Department of State

DOS worked closely with American industry and NGOs to convene a High Level Meeting in Tokyo, Japan in September 2016, under the Asia Pacific Economic Cooperation (APEC) framework, to discuss policy changes needed to overcome barriers to finance waste management

infrastructure in the Asia Pacific in order to prevent and reduce marine plastic pollution emitted into the marine environment. The Meeting brought together government officials from APEC economies, representatives from industry, international financial institutions, and experts, and adopted a set of nine Policy and Practice Recommendations. APEC Ministers endorsed these recommendations in November 2016, with APEC Leaders encouraging further work on waste management infrastructure financing. DOS continues to engage major source countries in Southeast Asia to encourage policy changes needed to prevent and reduce marine debris.

Incentive Programs

2008 Report Recommendations

- Federal agencies should support voluntary, incentive-based programs that encourage communities to adopt environmentally responsible practices. Examples may include Heal the Bay's "A Day Without a Bag" Program (a southern California non-profit organization) and the Clean Marina Program, an initiative involving Federal agencies and state governments.

- Federal agencies should work with state, local, tribal, and non-governmental entities to develop efficient recycling incentive programs for municipalities or appropriate venues.

- Federal agencies, where appropriate, should evaluate methods by which users of products that contribute significantly to marine debris can be given an incentive to select environmentally friendly alternatives or improve use of recycling infrastructure. Such incentive programs or pilot projects should include regular monitoring and evaluation of their effectiveness.

NOAA Marine Debris Program

NOAA MDP partners with Covanta Energy, Schnitzer Steel, and the National Fish and Wildlife Foundation on *Fishing for Energy,* an innovative program to provide fishermen with a no-cost option to dispose of unwanted gear. The gear is separated into material that can be recycled by Schnitzer Steel and material that is converted to energy in Covanta's facilities. Through this program, 322,000 pounds and 344,000 pounds of gear were collected in 2016 and 2017, respectively. Between 2008 and April 31, 2018, a total of 3,814,000 pounds of gear has been collected at bins placed in 54 ports across the country through the *Fishing for Energy* program. In addition to the bin program, MDP supported five prevention and research projects in 2016 with the fishing community through the *Fishing for Energy* program.

U.S. Environmental Protection Agency

The Clean Water Act (CWA) does not mandate the use of these regulatory mechanisms for trash. However, it is a tool that localities may use in conjunction with other non-regulatory measures to reduce trash loadings into water. EPA's TFW program works at both the national and regional levels, with projects that are designed to provide national resources and tools to address trash through storm water permitting programs, provide information to influence and support trash prevention behaviors and actions, contribute to international trash prevention initiatives, and support geographically-based TFW activities.

For example, in 2017 EPA created the Great Practices compendium, available on the TFW website. This information resource was developed in response to stakeholder requests for information on great trash reduction initiatives that have shown a strong return on investment. By compiling the available examples in the compendium, EPA creates incentives for other states and municipalities to consider developing and building institutional support for similar initiatives.

U.S. Coast Guard

In 2016, USCG continued its tradition of awarding the Biennial Rear Admiral William M. Benkert Award for Environmental Excellence. Benkert Award applicants are encouraged to provide examples of programs and initiatives that involve state, local, tribal, and NGO entities as part of a company's efforts to prevent pollution, ensure corporate buy-in, and work within its community. Key issues for Benkert Awardees include development of company policies on reduce, recycle, reuse efforts, and monitoring of effectiveness of their pollution prevention and environmental protection programs. For the 2016 award cycle, four companies earned formal recognition: Ocean Shipholdings, Inc., Harley Marine Services, SEAPRO, and U.S. Shipping Corp.

Enforcement

2008 Report Recommendations

- Federal agencies should continue to review enforcement authorities regarding marine debris and items that may become marine debris, enhance the effective use of those authorities as needed and appropriate, and ensure a coordinated approach to enforcement of relevant authorities.

- In appropriate cases, Federal agencies should refer violations of Federal law, such as the Act to Prevent Pollution from Ships, Clean Water Act, and Ocean Dumping Act, to the Environment and Natural Resources Division of the U.S. Department of Justice for civil or criminal enforcement action.

U.S. Environmental Protection Agency

Given the state and local focus of the aquatic trash issue, EPA does not engage in the enforcement of trash regulations and ordinances at the state and local levels. Rather, EPA's multi-faceted national and regional programs provide support to state and local agencies through information-sharing and other means. For example, in 2016 the TFW program supported a Louisiana project to create a compendium and "how to" guide to enable local parishes to create and enforce local trash prevention ordinances.

U.S. Coast Guard

The January 1, 2013 amendments to MARPOL Annex V prohibit the discharge, with very few exceptions, of most Annex V wastes (all of which would contribute to marine debris). Implementing regulations, under the Authorities in APPS, are contained in 33 CFR 151 and 33 CFR 158. It is likely too soon to gauge the effectiveness of what essentially constitutes zero-discharge for ships of any kind of waste material that contributes to marine debris. However, the USCG continues to assess the effectiveness of its MARPOL programs on both ships and at U.S. ports. U.S. ports and terminals are required to provide reception facilities for MARPOL wastes and ensure environmentally responsible disposal of such wastes.

USCG carries out port state safety and environmental inspections of foreign ships visiting U.S. ports (or transiting waters under U.S. jurisdiction, in some cases out to the 200 nautical mile EEZ) as allowed by international regulations (MARPOL and SOLAS). Where violations of regulations aimed at pollution prevention occur, the USCG investigates and may impose fines, prevent ships from sailing, or prevent ports or terminals from receiving ships. Where a ship violates pollution regulations, the USCG may refer cases to the Environment and Natural Resources Division of the U.S. Department of Justice under relevant authorities (Act to Prevent Pollution from Ships, CWA, and Ocean Dumping Act).

Bureau of Safety and Environmental Enforcement

During the 2016-17 timeframe, the BSEE Marine Trash & Debris Program conducted on-site inspections of a number of oil and gas platforms in the Gulf of Mexico. Company compliance has proven to be good, and these inspections have increased awareness among companies and workers.

U.S. Department of Justice

DOJ continues to address the problem of marine debris through judicial, civil, and criminal enforcement of environmental violations involving marine debris. Agencies such as EPA, NOAA, and USCG refer cases to DOJ, where they are handled by the Environment and Natural Resources Division, sometimes working with the U.S. Attorneys' offices [Recommendation 4.2, Enforcement].

For example, in April 2016, the U.S. District Court for the Southern District of Alabama sentenced crew members from the Norway-based shipping company Det Stavangerske Dampskibsselskab AS (DSD Shipping), including three of the ship's engineers, all foreign nationals, after a jury convicted them variously of conspiracy, violating the Act to Prevent Pollution from Ships (APPS), obstruction, and witness tampering charges. DSD Shipping will pay a $2 million fine, make a $500,000 community service payment to the Dauphin Island Sea

Lab Foundation, complete a 3-year term of probation, and implement an environmental compliance plan. The court sentenced two of the engineers to 6-month periods of incarceration, and the third to a 2-month period, and subjected them to deportation upon completion of their sentences. The charges stemmed from conduct in January 2010, when DSD Shipping knew the oily-water separator aboard the *M/T Stavanger Blossom* was inoperable. Rather than repair or replace the device, however, the company used various methods to bypass it and discharge oily wastes overboard. Prior to its arrival in the Port of Mobile, the ship illegally discharged approximately 20,000 gallons of oil-contaminated wastewater. Company employees intentionally dumped fuel oil sludge in plastic garbage bags directly into the ocean. They attempted to hide these discharges from the USCG by making false entries in the vessel's record books. Then, after arriving in Mobile, two of the engineers lied to the USCG about the discharge of sludge and ordered lower ranking crewmembers to do the same.

In June 2017, two shipping companies pleaded guilty to violating APPS and obstructing justice by covering up illegal dumping of oil-contaminated bilge water and garbage from one of their ships. Egyptian Tanker Company and Thome Ship Management were sentenced to pay a $1.5 million fine, joint and several, and make a $400,000 community service payment to the National Fish and Wildlife Foundation. The sentence also included a 4-year term of probation on each company and a requirement to implement environmental compliance plans. The plea agreement included a $1.9 million penalty and required marine and coastal restoration efforts at three National Wildlife Refuges located on the Gulf of Mexico in East Texas, where the offending vessel made port stops. As part of the fine, a single whistleblower received $250,000. During a port inspection in April 2016, the whistleblower informed the USCG that the ship, *M/T ETC MENA*, had illegally dumped bilge waste overboard, and provided several sources of documentary evidence. During an inspection of the ship, the USCG found a pump covered in oil submerged in the ship's bilge primary tank that looked similar to the pump the whistleblowing crewmember identified. Crewmembers bypassed the ship's oil water separator and illegally discharged bilge water into the ocean without noting the discharges in the ship's record book. The crew also was instructed to throw plastic garbage bags filled with metal and incinerator ash into the sea in without recording these incidents in the ship's book. The companies obstructed justice by presenting these false books to the USCG during the inspection in Port Arthur, Texas.

Also in 2017, a fishing vessel company operating in and around American Samoa pleaded guilty to violating APPS by maintaining false record books. The company, Yuh Fa Fishery (Vanuatu) Co. Ltd., owned the *F/V Yuh Fa No. 201* and, between June 2013 and June 2016, the vessel's engineers failed to document the illegal dumping of oily bilge water into the South Pacific. The engineers also made several modifications to the vessel's piping system, which allowed oily bilge water and sludge to be discharged overboard illegally. The ship's captains failed to accurately account for the disposal of garbage generated during extended fishing trips. Tons of oil sludge, waste oil, oily bilge water, and garbage remain unaccounted for as a result of the company's illegal actions. The sentence requires the company to pay a $1,875,000 fine, make a $625,000 community service payment to the National Marine Sanctuary of American Samoa, and serve a 5-year term of probation, during which vessels owned or operated by the company will be barred from entering any port or place of the United States.

Finally, DOJ enforcement of pollution laws such as the Resource Conservation and Recovery Act (RCRA) and the CWA, as well as ocean dumping and natural resource damage provisions, addresses the problem of marine debris by targeting pollution that, while not directly released into the ocean, may migrate downstream and eventually contribute to such debris.

Cleanups

2008 Report Recommendations

- ➢ Federal agencies should work together and contribute to coordinated removal efforts of marine debris and items that can become marine debris in areas under Federal jurisdiction, with priority given to heavily impacted areas.

- ➢ Federal agencies should examine how existing programs can be targeted to support difficult marine debris removal efforts.

- ➢ Federal agencies should partner with state, local, tribal, and non-governmental entities to continue to support and conduct cleanup efforts.

NOAA Marine Debris Program

In FY 2016, MDP funded 14 cooperative agreements through the NOAA community-based marine debris removal grant opportunity. This funding opportunity was also implemented in FY 2017, where 11 cooperative agreements were awarded. Through these grants, MDP supports locally-driven marine debris assessment and removal projects that will benefit coastal habitat, waterways, and NOAA trust resources. For a more in-depth description of MDP's cleanup priorities, see Section 5.3.

Additionally, since the program's establishment in 2006, MDP has contributed funds to support the large-scale marine debris survey and removal efforts within the Northwestern Hawaiian Islands, currently known as the Papahānaumokuākea Marine National Monument, the largest contiguous fully protected area under the U.S. Flag. Since MDP joined this effort, the project has removed 350.22 metric tons of marine debris. And since removals began in 1996, the NOAA Pacific Islands Fisheries Science Center and multi-agency partners have collectively removed 848 metric tons of derelict fishing gear and plastics from this pristine and remote area.

MDP contributes funding support for the Ocean Conservancy's ICC, the largest, single-day volunteer cleanup event. In September 2017, 504,583 volunteers cleaned up almost 15,000 miles of coastline in 112 countries, picking up more than 18.3 million pounds of trash. The most commonly found items included those that we use every day, such as cigarette butts, food wrappers, beverage containers, and plastic bags.

U.S. Environmental Protection Agency

EPA encourages participation in the annual ICC events sponsored by the Ocean Conservancy and has participated and partnered with others for trash and debris removal. However, given EPA's environmental protection role as mandated by the CWA, the focus of TFW is on actions that promote trash prevention. For example, rather than fund stand-alone cleanup efforts, TFW is developing a protocol for escaped trash assessment which would help identify sources and

therefore source reduction opportunities in communities. Such an audit has compounded benefits for remediating pollution, educating and engaging community members, and further highlighting points of intervention to reduce leakages.

EPA regional offices have been active in response to natural disasters such as hurricanes. These efforts include prompt response to severe storms and other types of disasters, as well as proactive work to protect the ecosystem health and services in anticipation of future events. A prominent example is the agency's preparation for and response to severe hurricane damage in Puerto Rico. As noted above, TFW works with the San Juan Urban Waters program in the Martin Pena Canal district as well as the San Juan Bay Estuary Program to support on-the-ground recovery and future resiliency efforts. With multiple EPA programs collaborating, more than 1,436 cubic meters of debris were removed from the San Juan Bay Estuary to prevent flooding and other public health problems. Household hazardous waste collection was also prioritized and addressed with the help of USACE because electronic waste and other items like drums or propane tanks pose significant threats to human and environmental health if they are not properly collected and disposed of after natural disasters.

Historically, EPA Region 9 (the Pacific Southwest Regional Office) has undertaken significant efforts to remove threats to human health and the environment posed by marine debris at several sites on the West Coast. Because marine debris typically harbors hazardous substances and/or oil, existing Federal pollution response authorities and funding sources were used to address these risks. Specifically, EPA used Federal hazardous substance and oil response authority under the CWA and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), along with funding authorities under CERCLA for hazardous substances and the Oil Pollution Act (OPA) for oil. Additionally, EPA used the statutes' implementing regulations, found at the National Oil and Hazardous Substances Pollution Contingency Plan. Region 9 has coordinated with the USCG and California EPA on key abandoned vessels and marine debris cleanups in Northern California, including in the Petaluma River, Bodega Bay, the California Bay-Delta, the Sacramento River, Humboldt Bay, the Tijuana Estuary, and the Oakland Estuary (San Francisco Bay).

U.S. Army Corps of Engineers

USACE removes and disposes of drift, debris, and derelict objects, such as sunken vessels, within Federally-maintained navigation channels that are obstructing navigation. USACE conducts routine patrols and responds to calls received from the USCG, U.S. Navy, boat and marina operators, and private citizens.

In 2016-2017, USACE utilized its existing debris removal authority to remove debris in Puget Sound, Washington; San Francisco Bay, California; New York Harbor, New York; Baltimore Harbor and Channels, Maryland and Virginia; the Potomac River and Anacostia River, Washington, DC; and the Hampton Roads, Norfolk and Newport News Harbor, Virginia.

Federal Emergency Management Agency (FEMA) can assign USACE to remove marine debris commonly referred to as wet debris that is outside of Federally-maintained navigation channels in response to a Presidentially-declared major disaster or emergency. The work performed under this task (to the USACE) addresses the removal of eligible obstructions, debris, and vessels from

waterways impacted by an event. The debris removal boundaries are within the waterway and include the shorelines of the waterway itself. Anything in a waterway that creates an obstruction to the movement of vessel traffic in a commercial or commonly used waterway and within the task-defined area is eligible.

Wet debris may include objects that have been carried by the flood waters, tidal/storm surge, and/or the wind and deposited in the waterway. Debris may include, but is not limited to, plastic foam containers, barrels, construction and demolition debris, and automobiles (i.e., anything man-made and remains resident in the water). USACE does not remove hazardous waste materials and receptacles.

U.S. Navy

At the local level, the U.S. Navy continues to partner with state and local authorities to assist in the removal of marine debris, as well as conduct beach and shore cleanups at its installations.

U.S. Coast Guard

While the USCG does not have a specific program with targeted funding for cleanups, local USCG field personnel contribute to community efforts as time and assets allow. Such activities may include harbor safety patrols for local events, beach cleanups, harbor swims, and awareness/outreach at community and local NGO events.

National Park Service

Marine debris damages coastal habitats, poses risks of injury to wildlife and potential hazards to visitors, and detracts from the scenery of national parks. In 2016 and 2017, NPS staff and volunteer organizations conducted cleanups across all regions of the National Park System. Organizational capacity for marine debris removal is greatly enhanced by utilizing volunteers and collaborating with external entities, including NGOs, universities, school groups, private corporations, and state and local governments. For example, Point Reyes National Seashore, California, collaborates with the Marin MPA (Marine Protected Area) Watch Volunteer Program under the Environmental Action Committee of West Marin and the California Academy of Sciences to clean up marine debris on park shorelines. Local volunteers are trained as citizen scientists and generate debris monitoring data for use by state and Federal agencies and private organizations. Biscayne National Park in Florida has partnered with the Coastal Cleanup Corporation, a nonprofit organization, since 2011. Volunteers have contributed approximately 5,000 volunteer-hours during 81 cleanups to remove marine debris and restore sea turtle nesting habitat. In FY 2017, 252 volunteers removed over 14,000 pounds of debris. At Assateague Island National Seashore in Maryland and Virginia, the Assateague Coastal Trust and Assateague Mobile Sportfishermen's Association provide hundreds of volunteer hours each year to remove marine debris from the island.

<u>Marine Debris Removal and Assessment Projects in Alaskan Coastal Parks</u>

Many NPS-managed beaches in Alaska receive significant accumulations of marine debris due to vessel traffic, ocean currents, and storm surges (Howell, et al. 2012). Removal operations in remote locations can present extreme logistical challenges. An analysis of debris collected from five National Park System units in Alaska in 2015 was published in 2017. The data showed

significant differences in the amount and types of debris deposited across these parks.[5] Parks in the Arctic show the lowest concentrations of marine debris, while parks in the Gulf of Alaska show variable concentrations based on location but have relatively high debris loads. The Alaskan coastal parks also participated in microplastics surveys noted below in 35 coastal parks across the United States, with the Alaskan parks generally showing lower levels of microplastics in beach sediments than other regions of the United States. Periodic removals and debris assessments in Alaska parks will continue to be critical with the changing climate, exploration, and increased vessel traffic, especially in the Western Arctic.

U.S. Fish and Wildlife Service

Every September, dozens of coastal National Wildlife Refuges and refuge Friends Groups organize their local communities to participate in the ICC. Refuge visitor services staff use these cleanup events as opportunities to also provide an educational experience for the public about the threats that marine debris poses to wildlife.

Hundreds of hours of staff/volunteer time are spent collecting marine debris on Pacific refuges, including Palmyra Atoll, Midway Atoll, Rose Atoll, Johnston Atoll, Guam, the Hawaiian Islands, and James Campbell National Wildlife Refuges.

The Puerto Rico Department of Natural and Environmental Resources and USCG, in conjunction with the Puerto Rico Environmental Quality Control Board, EPA, NOAA, and USFWS, are partners in the Emergency Support Function ESF-10 command post in Puerto Rico dealing with derelict vessels and hazardous materials due to hurricane damage.

Department of State

In 2016 and 2017, the DOS continued to support the Ocean Conservancy's ICC activities. DOS highlighted the event via social media and promoted the initiative through DOS alumni and outreach materials. Individual embassies also sponsored coastal clean-ups on Earth Day around the world. In February 2017, Embassy Jakarta worked closely with the hospitality industry in Bali, Indonesia, towards a waste reduction program targeting hotels and other tourist accommodations.

Research

2008 Report Recommendations

- ➢ Federal agencies, coordinating through IMDCC, should sponsor and conduct research to characterize the nature of marine debris and further investigate reducing, mitigating, preventing, and controlling marine debris and assessing its impacts, with a particular focus on developing cost-benefit analyses for these actions.

- ➢ Federal agencies, cooperating through IMDCC, should improve efforts to monitor marine debris, including shoreline, floating, and submerged debris, using lessons learned from previous Federally funded monitoring efforts.

[5] Polasek, L, Bering, J., Kim, H., Neitlich, P., Pister, B., Terwilliger, M.,...Jones, T. (2017). Marine debris in five national parks in Alaska. *Marine Pollution Bulletin, 117: 1-2*, 371-379. https://doi.org/10.1016/j.marpolbul.2017.01.085

- ➢ IMDCC should convene a special session at least once a year to share and discuss the latest research findings on marine debris, with summaries and identified gaps to be passed to the Subcommittee on Integrated Management of Ocean Resources (SIMOR)[6] and the Joint Subcommittee on Ocean Science and Technology (JSOST).[7]

- ➢ Federal agencies, coordinating through IMDCC, should sponsor and conduct research regarding the attitudes and practices of users of products that contribute to marine debris. In particular, such research should: a) investigate the willingness to alter attitudes and practices in a manner that would reduce marine debris; b) identify preferences with regard to potential incentive programs and which types of incentives are most likely to produce positive responses; and c) develop and test incentive programs intended to alter attitudes and/or practices among users of products that contribute to marine debris.

NOAA Marine Debris Program

In 2016 and 2017, MDP continued to implement its research strategy for 2016-2020. The research focus included the assessment of debris loads and trends for microplastics and macro-debris along U.S. coastlines and in the Mississippi River. In FY 2016, NOAA awarded one cooperative agreement to Texas A&M – Corpus Christi for work addressing these priorities.[8] In FY 2017, MDP held a research grant competition prioritizing research that explores the ecological risk associated with marine debris, determines debris exposure levels, and examines the fate and transport of marine debris in nearshore, coastal environments. NOAA awarded four cooperative agreements through this funding opportunity. For a more in-depth description of MDP's research priorities, see Section 5.5.

U.S. Environmental Protection Agency

EPA hosted the Microplastics Experts Workshop (MEW) in June 2017, where subject-matter experts from academia and Federal agencies including EPA, NOAA, USGS, and FDA convened to identify specific microplastics research needs. The MEW Report, which summarizes the expert findings of the workshop, was released in March 2018 and has played a central role in the prioritization of microplastics in EPA's research and water programs. The MEW Report identifies four main areas of information gaps: 1) research methods standardization; 2) sources and fate; 3) ecological risk assessment; and 4) human health risk assessment. As a follow-up to these expert recommendations, EPA is considering how best to address high-priority microplastics research needs as part of the agency's larger environmental research agenda.

In addition to facilitating microplastics research planning, EPA also is studying the impacts of marine microplastic pollution on marine life and human health. In collaboration with the University of California and State of California partners, we continue to undertake fish tissue studies involving Pacific and Great Lakes fish. Prior studies examined the uptake of toxic

[6] The Subcommittee on Integrated Management of Ocean Resources is now the Ocean Resource Management Interagency Policy Committee (ORM-IPC).

[7] The Joint Subcommittee on Ocean Science and Technology is now the Subcommittee on Ocean Science and Technology (SOST) and the Ocean Science and Technology Interagency Policy Committee (OST-IPC).

[8] The proposal was submitted to the agency through NOAA's Broad Agency Announcement. MDP did not publish a research-based funding opportunity in FY 2016.

contaminants into fish tissue. Starting in 2017, current EPA research is examining the stomach contents of the ocean study fish with the highest body loading of contaminants, investigating a correlation between plastic particles in the gut and increased concentrations of contaminants in the tissue.

U.S. Coast Guard

USCG supports IMDCC coordination of research to characterize the nature of marine debris. USCG continues to attend workshops and seminars focused on assessing the impacts of marine debris on the ocean environment, research on impacts of micro, meso, and macro plastics on the health of the oceans, and the effects of micro fibers on marine mammals and fish in the ocean.

National Park Service

Marine Debris Monitoring in Ocean and Great Lakes Parks

Coastal parks participate with partners in citizen science, monitoring, and removal of marine debris in collaboration with public and private sector entities using the Marine Debris Tracker App, the NOAA MD-MAP Protocols, and other tools. In the late 1980s and early 1990s, a pilot monitoring program conducted over several years in 10 ocean parks contributed to the development of monitoring protocols, volunteer training and education modules, and identification of the sources of debris.[9] These early efforts are informing current marine debris surveys in California and the Gulf Coast.

With support from MDP, staff members at Channel Islands National Park are collaborating with California State University Channel Islands to survey and remove debris at several monitoring sites. In 2016, staff, students, and researchers began measuring debris composition and abundance at Santa Rosa Island and Santa Cruz Island. Santa Rosa beaches surveyed in 1993 will be compared with current debris patterns to provide information on the changes in marine debris characteristics over a 27-year period. Concurrent surveys are also assessing microplastics (< 5mm), as well as the ecological benefits from debris removal. These efforts will deepen our understanding of marine debris impacts on marine life in and around the Channel Islands National Park and Channel Islands National Marine Sanctuary. Results are expected in 2019.

At Padre Island National Seashore in Texas and Gulf Islands National Seashore in Mississippi and Florida, surveys conducted in 2017 by the University of Texas and Mission-Aransas National Estuarine Reserve staff are expected to shed new light on debris patterns and data collected from early monitoring sites. The major types and possible sources of shoreline debris, as well as seasonal changes in the rate of debris deposition in these parks in the Northern Gulf of Mexico region, were assessed and compared with historical data. Preliminary results show that Texas has higher rates of debris washing ashore, that deposition peaks in the spring, and 93 percent of debris is composed of plastics.

[9] *See* Cole, C.A., & Kliwinski, S.(1998). *Final Report of the National Park Marine Debris Monitoring Program*. University Park, PA: Pennsylvania State University. *See also,* Miller, J., & Jones, E (2003). *Shoreline Trash – Studies at Padre Island National Seashore, 1989-1998.* University of Arizona.

Microplastics Surveys

- *Quantification of Microplastics across North American Coastal National Park System Units*
  Microplastics are small beads or fibers ranging from less than 5 mm to 0.33 um in size that enter water bodies and the ocean from wastewater treatment plants or surface runoff, or as larger plastic debris in the ocean that degrade and break down into smaller fragments. Microplastics can contain phthalates and Bisphenol A (BPA) and may also adsorb other organic pollutants such as Polychlorinated Biphenyls (PCB) and pesticides. The deposition of microplastics in rivers, oceans, and estuaries, and the introduction of these chemicals into the marine environment may present risks to marine life and human health. Between June 1, 2015, and May 31, 2017, NPS conducted a survey for the presence of microplastics in beach sediments at 35 ocean and Great Lakes units of the National Park System, in collaboration with the MDP and Clemson University.

  The purpose of this sampling project was to gain information about the potential presence of microplastics on park beaches, and to further assess potential regional sources and distribution of microplastics where parks are located. One beach in each park unit was sampled, providing a "snapshot" assessment of microplastic distribution across coastal parks. All sites sampled contained microplastics, including remote sites. Microfibers were the predominant type of debris found (97 percent by count). Variation in amounts of microplastics was high among sites, and no obvious patterns relative to local geography (e.g., nearness to urbanized sites or rivers) were observed. This study highlights the broad geographic distribution of microplastics and demonstrates the need to perform more detailed studies to understand sources and impacts of microplastics at a local scale.[10]

- *Targeted Studies of Microplastics in Coastal Parks*
  NPS and partners are conducting targeted studies to quantify local levels of microplastics in shoreline sediments and water bodies. California State University Channel Islands surveyed for microplastics in a total of 56 beaches on the mainland coast and at Channel Islands National Park as part of a comprehensive monitoring and removal project supported by the MDP (see above). Results indicate that Santa Rosa and Santa Cruz islands had lower densities of microplastics than mainland sites, but were still vulnerable to ocean-borne microplastics. NPS conducted follow-up sampling within Fort Pulaski National Monument in Georgia along the Savannah River to quantify levels of microplastics in oysters, sediment, and the water column, in response to relatively high levels previously detected at a beach sampling site. Preliminary results reveal microplastics in all samples; however, a presence in oysters did not correlate with microplastic levels observed in water and sediment samples. The distribution of microplastics in sediment and the water column could also not be readily explained by the flow of the Savannah River. Quantifying movement of microplastics at localized geographic scales may require more precise observations of smaller current patterns. Elevated microplastics concentrations were also detected at a sample site in Apostle Islands National Lakeshore in Wisconsin.

[10] Whitmire, S.L., & Van Bloem, S. J. (2017). *Quantification of Microplastics on National Park Beaches, 06/01/2015-05/31/2017*. NOAA Marine Debris Program.

In response to Lake Superior Partnership Working Group concerns raised in 2017 about emerging microplastic issues, NPS is working with the University of Minnesota-Duluth to study the prevalence and composition of microplastics in beach sands in the Apostle Islands relative to other beaches in western Lake Superior. NPS and university partners are using an existing hydrodynamic model to: a) explore the distribution of plastic particles in western Lake Superior; and b) better understand likely sources and transport pathways to the Apostle Islands (e.g., via tributary inputs or via atmospheric deposition).

- *Wildlife Mortality and Debris Entanglements*
  The California Redwood National and State Parks survey and monitor beached carcasses to maintain baseline information about seabird and marine mammal mortality, and to determine whether the mortalities resulted from natural or anthropogenic events, including marine debris entanglement. Very few cases show entanglement as the cause of mortality. Beached carcass data is collected in other areas of Humboldt and Del Norte Counties outside of the Redwood National and State Parks and along much of the coasts of Oregon and Washington by the Coastal Observation and Seabird Survey Team (COASST). Additional data is collected along Marin County (California) beaches by groups working with the Greater Farallones National Marine Sanctuary. NPS Southwest Alaska Inventory and Monitoring Network staff members also collect marine debris/animal carcass data on specific beaches in southwest Alaska parks.

Marine Mammal Commission

MMC has a small grants program that supports research projects aimed at meeting the goals of the Marine Mammal Protection Act. Such projects may include basic and applied research, literature reviews, and workshops, among others. In 2016, MMC funded a research project through the New England Aquarium to test a ropeless fishing gear prototype designed to prevent whale entanglements in active fishing gear and the creation of derelict gear. The project is ongoing, and 2017 efforts included vessel deployments and work with local fisherman.

Technology Development

2008 Report Recommendations

- Federal agencies should partner with state, local, tribal, and non-governmental entities to encourage the development of specific technologies that could prevent or reduce the amount of debris entering the marine environment or that could mitigate the impacts of marine debris on navigation, human health and safety, the economy, habitats, and species.

- Federal agencies should support research, technology development, and use of materials that will not persist in the marine environment.

NOAA Marine Debris Program

Through the *Fishing for Energy* partnership, the MDP previously funded work to develop innovative gear technologies and modifications to prevent the loss of fishing traps and to prevent traps from continuing to catch fish – or ghost-fish – if they are lost. In the State of Washington, this hands-on research resulted in inexpensive, easy to implement modifications to crab pots that

allowed crabs to escape after the pots were lost. In 2017, the Northwest Strait Foundation received a NFWF *Fishing for Energy* grant to turn these research findings into action on the ground. The Northwest Strait Foundation developed a program to encourage manufacturers to produce pots that allow crab escapes once the pots are lost, thus reducing ghost-fishing. For additional details on MDP's fishing gear technology development, see Section 5.5.

Researchers continue to significantly advance marine debris detection techniques and operations including unmanned aircraft systems, manned aerial surveys, and post-processing techniques, as well as emerging modeling techniques. During 2016-2017, the MDP continued to partner with the NOAA NESDIS Satellite Analysis Branch (SAB) on potential applications for satellite-based remote sensing, building off of in-situ tests conducted during NOAA's response to the 2011 Tohoku earthquake and tsunami in Japan and subsequent surveys in the Northwestern Hawaiian Islands in 2015. NESDIS and MDP continue to work together on plans for potential future field test operations that apply and assess new techniques in data collection and analysis.

U.S. Environmental Protection Agency

EPA's TFW and Sustainable Materials Management programs engage with many external entities on technology innovation efforts for sustainable packaging and improved recycling capabilities. EPA supports initiatives to promote "circular economy" approaches to plastic products and packaging.

U.S. Coast Guard

USCG supports technology development such as use of innovative new technologies for waste management and on-board treatment, exhaust gas treatment (scrubber) technology, and use of alternative fuels such as liquefied natural gas.

Fostering Coordination

2008 Report Recommendations

- Federal agencies should help sponsor and participate in workshops, conferences, and lectures that address issues related to marine debris and sources of marine debris to encourage the exchange of information that can inform the development of guidelines and implementation of actions to mitigate marine debris impacts.

- Federal agencies should participate in ongoing international activities to mitigate the impacts and reduce the amount of marine debris. Federal agencies also should support efforts to increase the awareness of such international marine debris efforts and encourage participation of other nations and international organizations in those efforts, as well as consider options for new international activities and initiatives to mitigate the impacts and reduce the amount of marine debris.

- IMDCC should serve as a central point for coordination of Federal efforts to develop new policies, strengthen existing policies, identify new research topics or projects, and address requests from Congress for specific information or actions related to marine debris.

- ➢ Federal agencies should pursue partnerships, as appropriate, with non-governmental entities to develop, promote, and implement strategies for preventing, reducing, or mitigating the impacts of marine debris.

NOAA Marine Debris Program

Domestic

Marine debris is an issue that varies greatly by region, and a crucial role of MDP is coordination with regional coastal managers, agencies, NGOs, industry, academia and other groups interested in addressing marine debris. As part of this role, the MDP coordinated throughout 2016 and 2017 on efforts to develop state emergency response plans for Florida, North Carolina, South Carolina, Georgia, and Mississippi. Additionally, it coordinated efforts to develop, enhance, and implement state action plans in California, Florida, Hawaii, Oregon, and Virginia, as well as regional action plans in the Great Lakes, the Gulf of Maine, the Gulf of Mexico, the Mid-Atlantic, and the Southeast. The purpose of these action plans is to facilitate and track collaborative and effective actions to prevent and reduce marine debris throughout the United States. Please see Section 5.6 for more details.

International

MDP continues to support international coordination efforts. During the German G7 Presidency in 2015, G7 leaders agreed to a G7 Action Plan to Combat Marine Litter, thus receiving head of state level attention. Marine litter continued to be a focus topic under the 2016 Japan G7 Presidency and 2017 Italian Presidency. In 2017, NOAA served as a U.S. representative at a workshop hosted by the Italian Government to continue discussions on Action Plan implementation, specifically looking at regional bodies such as the UN Regional Seas Program and Regional Fisheries Management Organizations.

From 2012-2017, MDP's Director served as the chair of the Global Partnership on Marine Litter (GPML). GPML is an initiative led by the United Nations Environment Programme (UN Environment) that seeks to protect human health and the global environment by reducing and managing marine litter. The GPML is voluntary and open to international agencies, governments, business, academia, local authorities, NGOs, and individuals. It serves as a coordinating forum for global activities addressing three overarching goals, which are based on the goals in the *Honolulu Strategy*. GPML also focuses on capacity building, information collection and sharing, financing, policies, and technologies. In 2018, one representative from the Seychelles Government and one from the International Maritime Organization assumed the role of GPML co-chairs.

The issue of marine debris, particularly marine plastic litter and microplastics, is a topic of great interest and urgency in many international fora for which NOAA provides input and leads or co-leads U.S. interests. One of the most important of these is the UN Environment Assembly (UNEA) forum, hosted by UN Environment Programme. UN Environment Assemblies occur approximately every other year and focus global attention on key environmental issues to be collectively addressed by UN Member States, other UN entities, regional and international organizations, and civil society, among others. The Second UNEA was held in May 2016, and UNEA3 was held in December 2017. At both of these assemblies, the urgency to combat marine plastic litter and microplastics was highlighted in a negotiated and agreed-upon resolution for the

international community to act. Furthermore, prior to UNEA4 (to be held in spring 2019), UN Member States are considering increased international collaboration through the UNEA process and potential UN Environment facilitation to combat this issue through some type of enhanced global partnership. The result of these discussions will have critically important ramifications for the future international focus on this topic. NOAA, and broader U.S. Government, will continue to engage to help guide this work.

Finally, throughout 2016-2017, MDP successfully coordinated with UN Environment, the University of New Hampshire's Coastal Response Research Center, and The Gulf and Caribbean Fisheries Institute to plan the Sixth International Marine Debris Conference (held in San Diego, California, from March 12-16, 2018). Additional conference details will be provided in the next report.

U.S. Environmental Protection Agency

EPA TFW program is inherently collaborative, forging relationships among all relevant and interested programs (Federal, state, local, public and private sector, businesses, NGOs, etc.). The TFW program activities support trash prevention and reduction efforts by many public and private stakeholders. Given the land-based origins of the aquatic trash problem, the TFW program has a strong emphasis on helping states, municipalities, and businesses work together to explore more effective ways to reduce litter, block trash entry into water, and reduce packaging waste.

To date, nine of EPA's ten regional offices have TFW work plans that support state and local trash prevention efforts. Each of these regions helps states, cities, and other important constituent groups determine whether and how best to apply the wide range of regulatory and non-regulatory tools at their disposal to keep trash out of water. Many initiatives tie trash prevention efforts to other geographically-based EPA programs. For example, EPA Region 2 has supported disaster recovery and resiliency efforts in Puerto Rico, linking TFW with Urban Waters (UW) and the National Estuary Program (NEP) recovery efforts in San Juan. EPA Region 4 has fostered a trash-reduction partnership with the Urban Waters partnership in Atlanta's Proctor Creek watershed. EPA Region 6 worked with Texas stakeholders to create an innovative adopt-a-spot clean-up program and data base in the Trinity River watershed; this program is now being expanded to other watersheds in the state. EPA Region 10 has developed an extensive TFW program with the Puget Sound Partnership NEP that includes a microplastics research element in the Salish Sea.

EPA also engages actively in international initiatives to address marine trash in the ocean. This international TFW work includes support for U.S. Government engagement in many bilateral and multi-lateral settings, including IMDCC, *Our Ocean* conferences, G7 and G20 dialogues, UN Environment initiatives, APEC, and collaborative projects with China, Peru, Panama, and Jamaica.

U.S. Coast Guard

USCG participates in workshops, conferences, and lectures that address MARPOL and related pollution prevention issues, including those aimed at prevention of plastic and marine debris impacts on the ocean environment.

USCG participates as the Head of Delegation to the International Maritime Organization (IMO) and at the International Organization for Standardization (ISO) on the development of international regulations and implementing guidelines, as well as ISO standards that provide operational guidance for all maritime stakeholders. Such ISO standards include specific guidance for ship operators and port and terminal operators aimed at managing shipboard wastes and preventing those wastes from ever entering the marine environment as marine debris.

USCG coordinates IMO and ISO activities across U.S. agencies, including IMDCC as appropriate, and with its international partners.

National Park Service

The recreational and scenic values protected by NPS galvanize a wide range of volunteers and partner organizations to conduct scientific monitoring and restore park beaches across diverse coastal environments. NPS resource management, interpretive, and volunteer staff work with NGOs, universities, school groups, private corporations, and Federal, state, and local agencies to accomplish marine debris removal and monitoring in each coastal region with parks. Coordination and collaboration greatly increase organizational capacity, public awareness, and scholarly interest in research in national park units.

U.S. Fish and Wildlife Service

USFWS continues to partner with NOAA and the State of Hawaii to remove marine debris from the Papahānaumokuākea Marine National Monument. Each year, many tons of debris are removed through this collaboration.

Department of State

DOS hosted the third *Our Ocean* conference in Washington, DC, in September 2016, calling attention to four specific focus areas including marine pollution. The EU hosted a fourth *Our Ocean* conference in 2017. Both conferences focused on concrete commitments from high-level government officials and private industry representatives, with almost one billion dollars in total commitments toward combating marine pollution. Indonesia will host the 2018 *Our Ocean* conference followed by Norway in 2019 and Palau in 2020.

DOS supported the U.S.-China partner cities initiative between the coastal cities of Xiamen and Weihai in China and San Francisco and New York, committing to share best practices related to waste management to reduce the flow of trash into the water. In November 2016, a Chinese delegation from Xiamen, Weihai, and the State Oceanic Administration met with city, NOAA and EPA officials in New York City, Chicago, and San Francisco. In November 2017, a U.S. delegation composed of DOS, EPA, NOAA, and the New York City Department of Environmental Protection officials visited Beijing, Xiamen, and Weihai. DOS will facilitate future engagements and development of a set of recommendations for solid waste management and marine debris prevention.

DOS has been actively highlighting the problem of marine litter at events around the world, especially in the major source countries in Southeast Asia. DOS worked with our missions in Jakarta, Indonesia to collaborate with the Indonesian and New Zealand Governments in co-

hosting an APEC-East Asia Summit conference in Bali, Indonesia, in September 2017 to build political support for national and regional action to combat marine debris. Our embassy in Bangkok engaged robustly in Thailand to host an Association of Southeast Asian Nations marine litter conference in Phuket, Thailand, in November 2017 aiming to develop a regional action plan to combat marine debris. DOS was also instrumental in the development of Germany's 2017 G20 Action Plan on Marine Litter.

Marine Mammal Commission

MMC partnered with the World Wildlife Fund (WWF) in 2016 to host a Congressional briefing on marine mammal bycatch. This briefing focused on bycatch as a result of active and derelict fishing gear. Panelists represented academic, NGO, recreational fishing industry, and Federal agency (NOAA) perspectives and featured Senator Lisa Murkowski and Congressman Jared Huffman as honored speakers. In 2017, MMC also addressed marine mammal bycatch issues in global fisheries (including derelict gear) during a workshop it hosted at the 22nd Biennial Conference on the Biology of Marine Mammals in Halifax, Nova Scotia.

In another collaboration with WWF and others, MMC helped convene an international workshop in Cambodia on Critically Endangered Mekong River freshwater dolphins in January 2017. As a follow-up to a 2017 workshop, the 2017 workshop assessed the significant progress made in enforcing a gillnet ban in dolphin habitat and locating and confiscating gillnets being used or abandoned in core dolphin zones as a means to reduce dolphin entanglement.

In March 2017, MMC staff participated in the Northeast Pinniped Entanglement Response Workshop, coordinated by NOAA and several local organizations. The workshop focused on seal entanglements in active and derelict gear, as well as in other types of marine debris.

MMC has actively worked on the entanglement issue for the vaquita porpoise in ghost gear in the Gulf of California. These efforts, including the vaquita CPR project in 2017, have been in coordination with the NOAA Southwest Fisheries Science Center, the Government of Mexico, the International Whaling Commission, and others.

4.0 NOAA Summary of Marine Debris Inventory

In June 2013, the MDP launched the Marine Debris Clearinghouse, an online database that serves as the Federal Government's information hub for marine debris stakeholders.

The site provides users access to specific information about, and environmental data from, ongoing and historical marine debris removal, research, and outreach projects. This resource is available to all interested members of the general public, coastal managers, researchers, and local communities to support their efforts to study and mitigate marine debris and its impacts. The Clearinghouse is accessible at: https://clearinghouse.marinedebris.noaa.gov/.

In FY 2016, MDP began the scoping process to re-develop the Clearinghouse. Based on the requirements identified through the scoping process, in FY 2017, MDP worked with NOAA's Office of Response and Restoration's Spatial Data Branch to begin development on the new site, which will add to the existing site and integrate new capabilities. The new Clearinghouse platform, built off of an existing data platform, will include an increased capability for direct data discoverability and accessibility, making project results, outputs, and products more readily encountered and accessed by the public. Coupled with an updated user interface and expanded data visualization features, the new site is targeted to provide users inside and outside of NOAA with more information, more rapidly, and more intuitively. MDP expects to launch the new platform in 2019 and will provide additional details in the next report.

5.0 Review of the NOAA Marine Debris Program

5.1 Program Administration and Structure

MDP is the Federal lead on efforts to research, prevent, and reduce the adverse impacts of marine debris. The program spearheads research efforts and provides nationally competitive funding opportunities for community-based marine debris removal, research, and prevention projects. MDP staff is strategically located across the country to lead region specific approaches to addressing marine debris through partnerships with state and local agencies, tribes, NGOs, academia, and industry in the regions.

MDP was originally authorized by Congress in 2006 through the Marine Debris Research, Prevention, and Reduction Act. In 2012, Congress amended this legislation to become the Marine Debris Act and revised various program components. Under the amended Marine Debris Act, the program's mandates to lead national and regional coordination and to research, prevent, reduce, and remove marine debris remained; and a new mandate to address severe marine debris events was added. The updated mandate recognizes the growing need to address the unusual amounts and types of marine debris following events such as tsunamis or hurricanes, and NOAA's critical role in responding to these events. These mandates are the foundation for the five pillars of the MDP: prevention, removal, emergency response, research, and regional coordination.

In 2016 and 2017, MDP continued to support activities across the country in each of the five program pillars and to address the adverse impacts of marine debris on the marine environment, navigational safety, human health, and the U.S. economy. In addition to addressing marine debris on a national scale, MDP has assumed a leading role in the global effort to combat marine debris by convening experts and promoting information-sharing. Tangible, action-oriented examples include MDP's leadership in the Fifth (2011) and Sixth (2018) International Marine Debris Conferences and the creation of the Honolulu Strategy as a framework for a comprehensive and global effort to address marine debris. The conference planning for the Sixth International Marine Debris Conference began in 2016 and 2017 and was organized and hosted by NOAA and UN Environment.

5.2 Prevention

Marine debris prevention activities are a crucial aspect of MDP. A robust education and outreach initiative has been developed to educate the public about the causes and impacts of marine debris, and to motivate attitude and behavior changes that result in the prevention and reduction of marine debris. MDP conducts education and outreach directly with the public across the country and through regional partners supported by either MDP's Prevention Grant funding opportunity or the *Fishing for Energy* program.

MDP has staff in ten coastal regions that participate in school education programs, lead teacher workshops, conduct outreach at regional events, and engage with local stakeholders. In addition, MDP routinely produces education and outreach materials such as fact sheets, posters, activity books, and curricula to assist with reaching these audiences. These materials are readily available and accessible for public use. MDP holds an annual national art contest for K-8th

grade students. Hundreds of student art works are submitted each year, and 13 entries are selected for inclusion in the annual MDP calendar. MDP has also installed educational displays at National Marine Sanctuaries and National Estuarine Research Reserves around the country. For a list of all of the displays and their locations, please see Table 4.

In addition to regional education and outreach efforts, MDP has an extensive digital communications strategy. MDP provides original content through its website, blog, monthly e-newsletter, quarterly educator e-newsletter, and social media platforms, which include Facebook, Twitter, Instagram, and Flickr. In 2017, MDP participated in an "Ask Me Anything" on microplastics on Reddit's science forum, reaching a potential 11.6 million people and being featured on the front page of the site. MDP launched a new blogging platform in 2017, offering blog visitors a seamless interaction with content on the Program's website and easy access to blog material.

Every other year, MDP supports partnership projects through its Prevention Grant funding opportunity. The intent of these partnerships is to change, in measurable ways, those specific behaviors that lead to litter and marine debris in coastal communities throughout the United States and territories. In FY 2016, the MDP provided over $680,000 to 12 projects ranging from education for fishermen to social marketing and awareness campaigns. For a complete list of prevention projects awarded in FY 2016, please see Table 3.

MDP also supports prevention projects through *Fishing for Energy*. Since launching in 2008, *Fishing for Energy* has processed more than 3.8 million pounds of old fishing gear from 54 ports across the Nation, a portion of which has been retrieved directly from the ocean by fishermen. Installation of a derelict fishing gear collection container in a new port is coupled with outreach to the fishing community, and a community event with fishers, local officials, media, and often, representatives of the state's congressional delegation. In addition, the *Fishing for Energy* partnership supports approximately five grant projects each year, several of which are prevention projects to educate fishermen and boaters about the impacts of derelict fishing gear and ways to reduce gear loss.

5.3 Removal

While prevention is essential to stemming the input of new debris into the ocean, removal is necessary to diminish the impacts of debris already introduced into the ocean. Each year, the MDP supports locally driven, community-based marine debris removal projects. The program also provides support to the annual ICC.

Through MDP's Removal Grant funding opportunity, MDP has funded over 135 removal projects and has removed over 7,000 metric tons of marine debris from the ocean. In 2016 and 2017, the program provided $2.4 million to support 25 organizations in 17 coastal states and U.S. territories on projects ranging from community cleanups, crab trap recovery, derelict vessel removal, and more. For a complete list of projects awarded in FY 2016 and FY 2017, please see Table 5.

As part of an ongoing effort since 1996, trained NOAA divers with the NOAA Pacific Islands Fisheries Science Center's Ecosystem Sciences Division remove derelict nets and gear each year

from the coral reefs and coastlines in the Northwestern Hawaiian Islands. In 2016, the effort, funded in part by MDP, removed nearly 11 metric tons of nets, plastics, and other marine debris from the shorelines and nearshore reefs. Due to various limiting factors, this near annual effort will now occur every 2-3 years. The latest large-scale mission occurred in September 2018 and collected more than 160,000 pounds of marine debris in just 41 days.

On March 11, 2011, the Tohoku earthquake with a magnitude of 9.0 shook Japan, triggering a tsunami with waves up to 130 feet that inundated over 200 miles of land and caused a staggering loss of human life and property. In the wake of the tsunami, debris from the inundation zone washed out into the ocean and, while some of it sank, much of the debris made its way across the ocean to the U.S. coasts. Following the tsunami, Japan provided $5 million to the United States with the intent to support marine debris response efforts, such as removal, disposal fees, cleanup supplies, detection, and monitoring. MDP is responsible for administering this fund and has distributed funds to the affected states (Alaska, Washington, Oregon, California, and Hawaii). Funding ended in 2016, and during this year a total of 234 tons of Japanese tsunami marine debris was removed from Alaska.

During the 2012 hurricane season, Superstorm Sandy inflicted severe damage to communities and coastal resources over large areas of the Mid-Atlantic and Northeast states, leaving a swath of destruction and large amounts of debris in the waters and marshes of affected states. The debris posed a hazard to navigation, commercial fishing grounds, and sensitive ecosystems. In response to the major marine debris event, Congress provided MDP with an additional $4.75 million through the Disaster Relief Appropriations Act of 2013 to locate and remove Sandy-generated marine debris. MDP provided funding to local partners in the affected states (Connecticut, Delaware, New Jersey, New York, and Rhode Island) to remove priority debris. In 2016 and 2017, a total of 2,247 metric tons of Sandy debris was removed from Connecticut, New York State, New York City, and Rhode Island.

5.4 Emergency Response to Hurricanes

Marine debris is an everyday problem, but natural disasters have the potential to make it worse. Natural disasters such as hurricanes, tropical storms, tsunamis, floods, and landslides can introduce immense quantities of debris into the marine environment, including large debris items such as furniture, appliances, and even entire homes. The active 2017 hurricane season caused marine debris impacts in the Gulf of Mexico, Southeast, and Caribbean regions. MDP assisted local, state, and Federal partners with the responses to Hurricanes Harvey, Irma, and Maria during the late summer and fall of 2017. In addition, MDP continued working with coastal states to develop emergency response guides to help local and state officials, along with Federal partners, respond to marine debris events caused by natural disasters and other man-made incidents.

Hurricanes Harvey, Irma, and Maria

Hurricane Harvey made landfall on the Texas coast on August 25, 2017, as a slow moving Category 4 hurricane with strong winds and heavy rains. Its extreme inland flooding affected communities throughout much of coastal Texas. MDP assisted the Texas General Land Office (GLO) with the mapping and tracking potential marine debris targets in a single response

mapping platform, using NOAA aerial imagery and data from Texas GLO field personnel. MDP also assisted FEMA as part of the Debris Task Force, leading the development of the "Texas Waterway Debris Emergency Response Flowchart" that assisted in the assessment and disposal of different types of hurricane debris.

Two weeks after Hurricane Harvey struck Texas, Hurricane Irma hit the U.S. Virgin Islands (USVI), Puerto Rico, Florida, Georgia, and South Carolina, causing impacts from very strong winds to heavy storm surges. Very soon after Irma made landfall, Hurricane Maria followed a similar track through the Caribbean Islands again hitting USVI and Puerto Rico, thereby amplifying existing destruction. Severe damage occurred throughout the region, including the destruction of homes, schools, roads, bridges, and marinas. All types of debris were found along the coasts and in the waterways, including 3,000 vessels that were left displaced throughout the state of Florida. As part of Emergency Support Function 10 (ESF 10), Oil and Hazardous Materials Response, USCG was mission-assigned by FEMA to mitigate potential pollution threats by removing these vessels. MDP response staff supported fellow NOAA colleagues, USCG, EPA, and the State of Florida by acting as the biological monitors providing guidance and support to removal operations field staff. This monitoring ensured impacts to natural and cultural resources were avoided or minimized. Vessel recovery and removal operations under the ESF-10 mission assignment for Florida were completed in January 2018. Throughout the duration of the mission, 2,679 vessels were assessed, and 2,389 vessels were removed under the ESF-10 mission or by a responsible party.

In early 2018, Congress provided NOAA with $18 million in supplemental funding through the Disaster Relief Act to help state and local partners in the affected states assess, prioritize, remove, and properly dispose of hurricane-generated marine debris.

Emergency Response Plans

In 2012, following the back-to-back 2011 tsunami and Superstorm Sandy debris events, MDP was reauthorized through the Marine Debris Act and the MDP's responsibility was expanded to include response to emergency marine debris events.[11] The program has been proactive in addressing marine debris emergency response by working with coastal states to develop emergency response guides. These guides aim to outline existing structures to facilitate coordinated, well-managed, and immediate responses to acute waterway debris incidents. In 2016, NOAA completed emergency response guides for Florida and North Carolina. In 2017, NOAA completed guides for South Carolina, Georgia, and Mississippi. MDP continues the process of developing similar response guides for other coastal states.

5.5 Research

MDP funded four research projects resulting from the FY 2017 Marine Debris Research Federal Funding Opportunity. The priorities from this competition included research that explores the ecological risk associated with marine debris, determines debris exposure levels, and examines the fate and transport of marine debris in nearshore, coastal environments.

[11] Marine Debris Act, 33 U.S.C. § 1951 *et seq*. (2006), as amended by Title VI of Pub. L. No. 112-213.

MDP received a total of 33 research proposals (including proposals from all 10 of the MDP regions), requesting a total of $7.2 million. MDP was able to fund four of these projects, totaling $935,156, which is almost double the funding from the last research grant competition held in FY 2013. The four funded projects are highlighted below.

FY 2017 Research Grant Competition – Funded Projects

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

Researchers from Woods Hole Oceanographic Institution and Royal Netherlands Institute for Sea Research are conducting fieldwork and laboratory experiments to provide essential data needed to calculate the risk of microplastic ingestion to scallop stock populations. The experiments focus on the movement of microplastics from the sea surface to the seafloor, and specifically investigate the role that seasonal microalgae blooms play in the increase of microplastic (333 microns to 5 millimeters in size) and nanoplastic (less than 333 microns in size) particles, forcing this debris to sink and become available for ingestion by sea scallops. Gut contents of scallops, collected since 2013 as part of the NOAA Northeast Fisheries Science Center's annual sea scallop survey, are being analyzed for microplastics in order to assess the amount of microplastics ingested and maintained in the body of scallops in a natural setting. In addition, lipid content in scallops are being analyzed to determine the risks associated with sea scallop larvae ingesting microplastics. Finally, microplastic and nanoplastic particles are being coated with opportunistic pathogens (*Vibrio* spp.) to determine if microplastics help transfer pathogens to adult sea scallops.

Microplastic Ingestion by the Black Sea Bass, Centropristis striata: An Assessment of Potential Impacts on the Health of an Atlantic Commercial Fish Species

Researchers from the University of North Carolina Wilmington, North Carolina State University and Oregon State University are examining wild-caught black sea bass, a commercially important species in North Carolina, for evidence of microplastic ingestion and overall health. In the laboratory, researchers are conducting controlled experiments with both larval and juvenile cultured black sea bass to determine if microplastics can be transferred from prey to predator. Targeted experiments are also tracking the movement of plastic pellets through the digestive tracts of juvenile black sea bass to determine their residence times and the leaching rates of plastic additives to the fish tissue.

Selective Ingestion of Microplastics by Oysters: Exposure Assessment as a Predictive Tool for Assessing the Environmental Risk to Commercially-Important Bivalves

Researchers from the University of Connecticut are investigating the types and concentrations of microplastics commonly found in and around a natural bed of oysters in the Long Island Sound using water samples, benthic sediments, and oyster tissues. Though oysters are filter feeders, they can select what particles they ingest. To understand what types of microplastics are ingested versus rejected, laboratory experiments are being conducted to expose oysters to several types of microplastics with different characteristics (e.g., size, shape, aspect ratio, etc.). Groups of oysters are then exposed to either the most frequently ingested or rejected types of microplastics and any adverse effects on digestive processes are determined. Finally, researchers are developing a statistical model to predict the likelihood of different microplastics being ingested by oysters.

A Screening-Level Ecological Risk Assessment for Microplastics in Seafood in American Samoa

Researchers from Arizona State University are collecting samples of water, sediment, bivalves, and market fishes to determine microplastic concentrations in these samples and to analyze them for organic contaminants. Researchers are also comparing the concentrations of organic contaminants in the water, sediments, and seafood samples with the concentrations found attached to the microplastics. Using this information, they are estimating the toxicological impacts of microplastic and organic contaminant pollution on locally-consumed seafood in order to characterize the potential ecological risks to marine ecosystems and health risks to human populations in American Samoa.

Other MDP-Funded Research Projects

Quantifying and Characterizing Microplastic Marine Debris Loads in the Mississippi River

Through a NOAA Broad Agency Agreement, scientists from Texas A&M University Corpus Christi, St. Louis University, University of Central Florida, Louisiana State University, and The National Great Rivers Research and Education Center were awarded funding in 2016 to quantify microplastic loads throughout the Mississippi River watershed, and produce baseline data for one of the largest and most populated river catchments in the world. Researchers are working to obtain surface and subsurface water samples at 11 locations along the Mississippi River watershed, including above and below the confluence of where major tributaries enter the Mississippi River. Water samples are being processed in a laboratory at Texas A&M where microplastic particles are isolated, quantified, and characterized. This information will help guide future studies on impacts to aquatic organisms and sources of microplastics to the Gulf of Mexico.

The Economic Impacts of Marine Debris on Tourism-Dependent Communities

MDP is partnering with Abt Associates to conduct a study to understand how marine debris affects the economies of tourism-dependent coastal communities. The study will consist of a beach intercept survey conducted during the summer of 2018 to collect names of beachgoers willing to complete a beach recreation survey. Surveys will be sent to individuals from four regions in the United States. The survey will ask general questions about beach visits and valued beach amenities, followed by contingent behavior questions related to marine debris. Responses from returned surveys will be incorporated into a Regional Input-Output Modeling System economic model.

Quantification of Microplastics on National Park Beaches

NPS and Clemson University's Baruch Institute of Coastal Ecology and Forest Science conducted a two-year research project (2015-2017) to assess the abundance of microplastics and micro-debris on beaches in 35 national parks, monuments, recreation areas, and seashores on the ocean and Great Lakes, and explored potential sources and distribution of this debris at regional scales. MDP funded this project through a contract with Genwest Systems Inc. For more information on this project, see the National Parks Service entry under ***Section 3.1, Research, National Park Service – Microplastic Surveys***.

Derelict Fishing Gear – Impacts, Detection, Loss Prevention, and New Technologies

Between 2014 and 2016, MDP supported research to investigate the ecological and socioeconomic impacts of derelict fishing gear in the Chesapeake Bay. Through a contract to Global Science and Technology, and subcontracts to the Virginia Institute of Marine Science, Versar, Inc., and CSS-Dynamac, these project partners conducted a regional DFG impact assessment and developed a framework with technical recommendations and best practices for implementing similar DFG assessments in other regions of the U.S. Study results demonstrated that derelict crab pots in both Maryland and Virginia compete with active crab pots, killing approximately 3.3 million blue crabs annually and capturing more than 40 non-target fish species. Using a model over a 6-year period from 2008-2014, researchers found that targeted removal of derelict crab pots in high-density fishing areas led to an estimated increase in harvest of 38 million pounds across the Chesapeake Bay. This 23.8-percent increase resulted in estimated gains of $33.5 million. Over the 6-year period, $4.18 million were spent to remove 34,408 derelict pots, resulting in increased gear efficiency for the active commercial fishery and an additional 29.8 million pounds in harvest valued at $21.3 million. This figure includes the payment to the participants and the purchase of the equipment (side scan units) used to locate the derelict gear. It does not include funding to collect, coordinate, and analyze the data.

Marine Debris Metadata Analysis: Status of Marine Debris on U.S. Shorelines

In 2015, MDP partnered with the Ocean Conservancy, and scientists and statisticians from the Commonwealth Scientific and Industrial Research Organisation (through a subcontract from the Ocean Conservancy) to conduct a rigorous analysis of the Ocean Conservancy's 30-year ICC dataset and MDP's MDMAP dataset to detect trends and patterns of marine debris on U.S. shorelines. The project concluded in 2017, and results from this study estimate a range of 20 million to 1.8 billion debris items on U.S. coastlines. More debris was found near urban centers compared to less populated areas. Currents and winds may also drive debris accumulation on beaches. Texas and the Mid-Atlantic States were identified as having high debris loads from the ICC data set. Findings from the MDMAP data set indicate that states with container deposit legislation had fewer beverage containers on their beaches than states without this type of legislation. Through monitoring fieldwork and analysis of the data sets, this study also identified areas of improvement to strengthen data collection protocols.

Completed Series of Topic Papers on Marine Debris Issues

In 2017, the 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. These papers can be found on MDP's Reports and Technical Memos webpage (https://marinedebris.noaa.gov/reports-and-technical-memos).

Marine Debris Monitoring and Assessment Project

MDP initiated the MDMAP following the 2011 Japan tsunami to monitor and assess shoreline sites in regions impacted by Japan tsunami marine debris. In 2013, MDP published standardized techniques for assessing debris on shorelines, on water surfaces, at-sea, and in benthic environments. Since it was created, MDMAP has expanded to include over 330 sites in 20 states (Alaska, Alabama, California, Delaware, Florida, Hawaii, Louisiana, Massachusetts, Maryland,

Maine, Michigan, Mississippi, North Carolina, New Jersey, Ohio, Oregon, South Carolina, Texas, Virginia, and Washington), as well as international sites in Canada, Mexico, the Bahamas, the Federated States of Micronesia, Ecuador, Tonga, Palau, and Costa Rica. The project has recorded over 4,076 surveys and over 576,622 individual items.

MDMAP is a citizen science initiative that engages NOAA partners and volunteers across the nation to survey and record the amount and types of marine debris on shorelines. Each passionate and dedicated partner in the MDMAP network selects a nearby shoreline monitoring site that they return to monthly to conduct surveys and submit meaningful data to the MDMAP Database (https://mdmap.orr.noaa.gov/login).

Through the project, MDP collects baseline data that is used to detect trends and patterns of marine debris on shorelines and can also be used by partners to identify targets for mitigation and evaluate the effectiveness of marine debris prevention efforts. Survey data and photos are recorded and entered in an online database to facilitate data analysis and regional comparisons of debris types, abundances, and trends. In June 2016, MDP launched a MDMAP "Get Started Toolbox", which provides many useful resources for existing and new MDMAP partners including: tutorial videos, protocol documents and field datasheets, a database user guide, data analysis templates, a photo ID manual, and FAQs. In 2017, MDP teamed up with NOAA's Office of National Marine Sanctuaries to create a Marine Debris Monitoring Toolkit for Educators to promote the incorporation of marine debris field surveys into curricula.

For a full list of MDP-funded research projects, please see Table 6.

5.6 Regional Coordination

MDP is the Federal lead in addressing the national problem of marine debris; however, the types and impacts of marine debris vary largely by region. As a result, the MDP has a strong regional coordination component to work with local communities to address their region-specific marine debris issues. MDP has ten regional coordinators working in Alaska, the Pacific Northwest, California, Hawaii and the Pacific Islands, the Gulf of Mexico, the Caribbean, the Mid-Atlantic, the Northeast, the Southeast, and the Great Lakes. These coordinators provide technical expertise to partners in their respective regions on marine debris projects, assess regional needs, work with state and local agencies to implement prevention strategies, and act as a hub of information for coastal managers, nonprofits, and other groups interested in addressing marine debris.

Action Plans and Planning Workshops

In 2016 and 2017, MDP Regional Coordinators worked with partners in several regions and states to initiate and continue the development of regional action plans to address marine debris. These action plans focus on long-term solutions to the causes and impacts of marine debris in the regions, as well as outline operational best practices and data collection protocols. The purpose of these plans is to aid states in preventing and reducing debris, and mitigating coastal impacts.

Great Lakes

In May 2014, *The Great Lakes Land-based Marine Debris Action Plan* was finalized, establishing a comprehensive framework for strategic action to ensure that the Great Lakes, its coasts, people, and wildlife, are free from the impacts of marine debris. This 5-year plan, spanning from 2014-2019, was the result of several years of hard work and planning by stakeholders in the region. Each year, the partners produce an Action Summary Report detailing progress made on the 53 actions in the plan. Both the action plan and the summary reports are available on the MDP website. As of the end of 2017, contributors had begun work on 29 actions and successfully completed 17 actions. Six actions have not yet begun, and one has been removed during review.

Hawaii

Hawaii developed the *Hawaii Marine Debris Action Plan* (HI-MDAP) in 2010 as the result of a workshop that brought together government, academia, nongovernmental organizations, and private business stakeholders. The plan was created to establish a comprehensive framework for strategic action to reduce the ecological, health, safety, and economic impacts of marine debris in Hawaii by 2020. HI-MDAP was updated following stakeholder workshops in 2012 and 2014. In July 2016, a fourth workshop was held to review accomplishments in implementation and to revise the plan significantly to adapt it to changing conditions. The goals and objectives were reassessed, and a new research goal was created. Progress updates are submitted by partners for inclusion into a quarterly update newsletter, which is compiled by the MDP and sent out to the HI-MDAP community. The next HI-MDAP update workshop is planned for the summer of 2018.

Florida

In 2014, MDP initiated the process of developing a Florida marine debris reduction plan. The final Florida Marine Debris Reduction Guidance Plan was released in January 2017. The plan is a compilation of recommended strategies and actions toward reducing the impacts and amount of marine debris in Florida. It is the result of multiple years of collaboration between stakeholders including Federal and state agencies, local governments, NGOs, universities, and industry. To date, the plan has acted as a guide to measure progress toward addressing the marine debris problem in Florida. Five working groups focused on specific categories of marine debris meet twice a year to detail progress on action items listed in the plan, share ideas, and discuss challenges. The working groups are coordinated and lead by MDP. The next update workshop will be scheduled in 2019.

Virginia

In June 2017, representatives from academia, NGOs, businesses, and Federal, state, and local agencies worked together to update the *Virginia Marine Debris Reduction Plan* (originally finalized in October 2014). The plan outlines near-term (2 years), mid-term (2 to 5 years), and long-term (up to 10 years) actions under five goals – leadership, prevention, interception, innovation, and removal – to address marine debris on a statewide basis. The plan is available on the MDP website.

Mid-Atlantic

MDP participated in a workshop for stakeholders in the Mid-Atlantic region (DE, MD, DC, and VA) in June 2017 to continue the planning process for the development of a regional marine debris reduction plan.

Gulf of Maine

MDP led a workshop for stakeholders in the Gulf of Maine region (MA, NH, ME, and Canadian representatives) in June 2017 to continue the planning process for the development of a regional marine debris reduction plan.

Southeast

MDP led a second workshop for stakeholders in the Southeast region (NC, SC, and GA) in January 2016 to continue the planning process for the development of a regional marine debris reduction plan.

California

The California Ocean Protection Council and MDP led efforts to update the California strategy (i.e., action plan) to address ocean litter. Representatives from industries, tribes, local governments, and state and Federal agencies were invited to participate in two workshops in 2017 aimed at generating action items that would help solve the problem of ocean litter in California. All stakeholder action items in the strategy document were identified by workshop participants. The updated document, *California Ocean Litter Strategy: Addressing Marine Debris from Source to Sea*, is available on the MDP website.

Oregon

MDP initiated the Oregon Marine Debris Action Plan in FY 2016, and it was completed in FY 2017. In an effort led by MDP, representatives of state and Federal agencies, tribes, NGOs, academia, and industry convened for a workshop in which goals, strategies, and actions were identified. The input from this workshop was used to create the action plan document, which was reviewed by the partners, and completed in a second workshop. Following additional review, the *Oregon Marine Debris Action Plan* was finalized. To date a number of the actions have been completed or are in progress, and two semi-annual updates have been sent to partners and other interested parties.

Washington

The *Washington State Marine Debris Action Plan* started in FY 2017 and is now in progress. In December 2017, representatives of agencies, tribes, NGOs, academia, and industry convened for a workshop in Ocean Shores, Washington. Together they proposed goals, strategies, and actions for the action plan, which were used for the plan's initial draft. A second workshop was held in May 2018. The Washington Marine Debris Action Plan was released in September 2018.

Alaska

MDP leading a workshop for stakeholders in Alaska during the 2018 Alaska Forum on the Environment to continue discussions on developing a state marine debris action plan, adapting

frameworks from other states to identify a structure that works for the unique challenges and opportunities in the Alaska region.

6.0 Review of U.S. Coast Guard Programs

6.1 Overview

USCG continues to play an important role in the prevention and reduction of marine debris. Throughout the 2016-2017 reporting period, USCG sustained its commitment to reducing ship-sourced marine debris through the enforcement of domestic and international laws. In keeping with its core mission of environmental stewardship, USCG assisted its interagency partners in identifying and removing of marine debris under its authorities. USCG continued to participate in the U.S. Committee on the Marine Transportation System integrated action teams with its agency partners on Arctic shipping, port infrastructure and pollution prevention including ship sourced marine debris prevention.

During 2016-2017, the USCG maintained its Certificate of Adequacy (COA) waste reception facilities program and continued its domestic and international outreach efforts with respect to the COA program. USCG's COA program requires compliance with MARPOL regulations by ensuring that adequate reception facilities for ship waste are available to all ships calling at U.S. ports or terminals. USCG issued updated guidance for reporting of inadequate reception facilities.

During the 2016-2017 reporting period, USCG continued to provide leadership at IMO. The work during this period included adoption of the Polar Code Amendments to MARPOL and the Safety of Life at Sea (SOLAS) Conventions. IMO included provisions for protecting the Arctic marine environment from ship-based pollution. For example, in the Polar Code Amendments to MARPOL, USCG articulated some of the unique challenges for the prevention and removal of marine debris in Polar Regions and worked closely with the U.S. Delegation to the Arctic Council's Working Group on Protection of the Arctic Marine Environment as shipping activity continues to increase.

USCG staff continued its cooperation with international partners on marine environmental protection and continued to chair the International Organization for Standardization work group (ISO/TC8/SC2/WG4) on the development of international standards for management and handling of ship waste. In 2016, ISO accepted the proposals to update ISO 21070, international standards on management of shipboard garbage. In 2017, WG4, under USCG leadership, completed revisions and submitted ISO 16304 on the operation of ship waste port reception facilities (PRF) for review and acceptance. These two international standards are key areas for reducing and eliminating ship-sourced marine debris. In 2017, WG4, again under USCG leadership, submitted revisions to the ISO standard on operating shipboard waste-treatment equipment (shipboard incinerator standards).

USCG continues to support education and outreach-to-mariners and promote marine debris awareness among the public through its Sea Partners Campaign and USCG Auxiliary outreach program and in partnership with NAMEPA. In 2016 and 2017, the USCG continued to work with NAMEPA focusing on key issues involving MARPOL compliance, safety, and marine environmental protection and mariner training.

As mentioned above, USCG is addressing a particular area of concern for the prevention of pollution from ships in Arctic waters. Working with the Arctic Council's Protection of the Arctic Marine Environment (PAME) Group as a member of the U.S. Delegation, USCG has assumed a leadership role on managing the operational wastes from ships as commercial shipping in the Arctic increases across all sectors. USCG, acting as co-chair of an international work group, coordinated a submittal to the IMO proposing amendments to MARPOL that would allow for a comprehensive approach to waste management aboard ships and at ports or terminals servicing Arctic-bound ships. A regional waste management approach for the Arctic would enhance efforts to ensure ships can comply with MARPOL restrictions on discharges, including marine debris, into Arctic waters.

6.2 Compliance and Enforcement

USCG maintains the MARPOL compliance and enforcement program for ships and ensures the adequacy of waste reception facilities in U.S. ports and terminals and their ability to receive MARPOL Annex V wastes from ships. These efforts contribute to the reduction of ship-sourced pollution, which is responsible for a portion of the marine debris in the oceans.

Ship-Generated Garbage and Port Reception Facilities

USCG verifies that domestic waterfront facilities maintain the capability of receiving garbage and wastes from ships through its COA program. USCG continues to monitor compliance through annual facility inspections and harbor and port spot checks. Criteria for determining the adequacy of garbage reception facilities and their compliance with MARPOL Annex V can be found in 33 C.F.R. §§ 158.400-420. The USCG has recently updated its application forms and procedures for reporting inadequate PRF at U.S. ports and terminals.

USCG also continues to monitor and gather information on MARPOL reception facilities, including information relating to inspections, investigations, and pollution incidents directly connected to MARPOL Annex V waste streams. In FY 2016, the USCG conducted 583 facility inspections related to MARPOL Annex V and issued or renewed 263 COAs. In 2017, USCG conducted 615 facility inspections related to MARPOL Annex V and issued or renewed 229 COAs. Currently over 1,500 U.S. ports and terminals have been inspected and hold an active COA.

USCG receives reports of inadequate reception facilities and can inspect to determine compliance with a COA. In addition, USCG responds to the Flag State and provides information on reception facilities and any actions taken to ensure adequate reception facilities are available at U.S. ports and terminals. USCG published updated guidance on MARPOL and reporting procedures to field units, ports and terminals, and ship operators in 2017. USCG maintains a list of U.S. ports and terminals with valid reception facility COAs in compliance with APPS. This data is available to the public on the USCG Maritime Information Exchange (CGMIX) website (http://www.nrc.uscg.mil/).

Ship-Generated Garbage: Shipboard Compliance and Enforcement

USCG ensures foreign vessel compliance with U.S. regulations related to marine environmental protection primarily through Port State Control Examinations. USCG also inspects U.S.

commercial vessels annually. Inspectors may expand an examination if there are clear grounds for suspecting potential MARPOL violations. For uninspected recreational and commercial fishing vessels, USCG conducts boardings to determine compliance with domestic and international laws, including environmental laws. In 2016 and 2017, USCG conducted over 9,000 boardings and safety exams each year on all types of vessels.

6.3 Debris Removals

As previously reported, USCG's primary authority for the removal of abandoned and derelict vessels on or adjacent to the navigable waters of the United States pertains to the prevention and mitigation of pollution-related incidents from discharges into the marine environment from oil or hazardous materials. USCG's authority for responding to these incidents falls mainly under the CWA, OPA-90, and CERCLA, with funding authorization under OPA-90 for oil pollution incidents and under CERCLA for hazardous substance releases, respectively. Under each of these authorities, the USCG must determine: 1) the vessel(s) are discharging oil or releasing hazardous substances or pose a substantial threat of an oil discharge or a hazardous substance release; 2) the responsible party is not mitigating or removing the pollution threat as required by law; and 3) the removal of a vessel is the best option to mitigate the actual or threat of discharge. Under certain circumstances, USCG may exercise authority under the Abandoned Barge Act (46 U.S.C. 4701 *et seq.*) to remove abandoned barges. USCG may also seek to remove an abandoned or derelict vessel when the vessel is a hazard to navigation.

In cases where vessels do not pose a pollution threat, local USCG units may coordinate with USACE, NOAA, and state and local program managers to resolve and mitigate the incident. These often involve cases where vessels pose a threat to navigation, obstruct a navigable channel, or endanger protected or sensitive habitat. State authority is typically acted upon when neither USCG nor USACE has authority (e.g., when a vessel is not located in a navigable waterway, does not pose a pollution threat, or is a barge less than 100 gross tons).

Marine Debris Removal Actions by the USCG under the Stafford Act

The Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law (P.L.) 93-288 (42 U.S.C. 5121 *et seq.*) addresses several areas of Federal Response Actions for both natural and human-caused disasters. The Act creates a National Response Framework, and its Annex outlines Agency-specific Emergency Support Functions (ESF). ESF#10 addresses oil and hazardous materials response and names the USCG as a primary coordinating agency. ESF#10, when activated, provides Federal support in response to an actual or potential discharge and/or uncontrolled release of oil or hazardous materials.

2017 Hurricane Irma/FL, Hurricane Maria/PR

During the 2017 hurricane season, the USCG and partner agencies activated ESF#10 in Florida (Hurricane Irma) and in Puerto Rico (Hurricane Maria). Specific USCG and partner agency actions included:

- Coordination, integration, and management of the overall Federal effort to detect, identify, contain, clean up, dispose, or minimize releases of oil or hazardous materials, or prevent, mitigate, or minimize the threat of potential releases

USCG-Coordinated Response Operations included:

- Rapid Pollution Assessment & Mitigation
- Vessel Target Assessment
- Vessel Owner Outreach & Notification
- Vessel Removal Actions

In Florida and the Florida Keys, the USCG and Federal, state, and local partners conducted 2,389 removals of damaged/derelict vessels impacted by Hurricane Irma under the ESF-10 mission or by a responsible party. Partner agencies included the Florida Department of Environmental Protection, NOAA, the Florida Fish and Wildlife Conservation Commission, and EPA.

In Puerto Rico, USCG, and Federal, state, and local partners conducted 377 removals/mitigations under ESF#10. Partner agencies included EPA, NOAA, Commonwealth of Puerto Rico Department of Natural and Environmental Resources, and contractors and local officials in Puerto Rico and the Island of Vieques.

6.4 International Activities

IMO is a specialized agency of the United Nations that is responsible for measures to improve the safety and security of international shipping and to prevent marine pollution from ships. Its decisions form the basis of member-state marine pollution enforcement regimes, including port state inspections, self-reporting, and record-keeping. As head of the U.S. IMO delegation, USCG works to advance a number of key environmental interests at meetings of IMO's Marine Environment Protection Committee.

As reported above, the amendments to MARPOL Annex V came into force on January 1, 2013, and with limited exceptions, prohibit the discharge of all garbage from ships into the sea. USCG has implemented the amendments to MARPOL Annex V through its regulations applicable to all ships operating in U.S. waters and all U.S. Flag ships operating anywhere on international voyages. USCG took a leading role in the development of the Polar Code, amendments to MARPOL providing enhance safety and environmental protections for the Arctic, including waste discharge restrictions. USCG, through its Certificate of Adequacy program, ensures that U.S. ports and terminals provide reception facilities that are consistent with U.S. waste discharge obligations under MARPOL.

Additionally, USCG has taken a leadership role in the Arctic Council PAME working group's development of a regional waste management approach. The U.S. co-chaired a submittal, co-sponsored by the eight Arctic Council member States, to the IMO's Marine Environment Protection Committee of a new output to amend MARPOL to allow for regional reception facilities for Arctic and Near Arctic Ports and Terminals.

USCG actively participates in the development of ISO standards for reception facilities and handling of ships' waste. Since 2016, USCG staff have acted as Vice Chair of ISO's Marine Environment Protection Committee (ISO/TC8/SC2).

6.5 Outreach

The Sea Partners Campaign is the USCG's environmental education and outreach program focused on developing community awareness of maritime pollution issues and improving compliance with marine environmental protection laws and regulations.

The Sea Partners Campaign has educated hundreds of thousands of children on the stewardship of our oceans. In partnership with the USCG Auxiliary, the Sea Partners Campaign has been correlating marine debris, oil spill, and invasive species subject matter with national education standards. In addition to its education and outreach efforts, the Sea Partners Campaign continues its efforts to reach the maritime industry through a proactive USCG presence at boat shows, distribution of MARPOL placards to merchant mariners, distribution of placards with anti-pollution messages to marinas and boating communities, and outreach to marina owners and operators through the USCG Auxiliary. USCG Auxiliary reports its vital operational hours for the Sea Partners Campaign in its reporting database, AUXDATA. In 2016 and 2017 combined, over 9,000 hours were committed toward the Sea Partners Campaign.

USCG is committed to reaching a wide variety of audiences. In 2016 and 2017, USCG continued to work under the 2012 Memorandum of Agreement with NAMEPA to work together on outreach and education materials for industry and the boating public.

7.0 Funding

Section 1954(e)(5) of the Marine Debris Act requests an estimate of "Federal and non-Federal funding provided for marine debris and recommendations for priority funding needs." IMDCC has interpreted the non-Federal funding to be the required non-Federal match associated with the grants program authorized in Section 3of the Marine Debris Act. The Federal agencies on IMDCC provided the following information for FY 2016 and FY 2017. IMDCC agencies' recommendations for priority funding needs are reflected in the President's Budget request and annual operating plan for each agency in any given fiscal year.

Table 1: FY 2016 to FY 2017 Agency Marine Debris Funding

AGENCY	FY 2016	FY 2016 Non-Federal Match	FY 2017	FY 2017 Non-Federal Match	General Activity Description	Budget Line
DOC/NOAA	$6,000,000	$2,166,517	$6,500,000	$1,944,621	Prevention, Removal, Research, Emergency Response, and Regional Coordination	Coastal Science, Assessment, Response, and Restoration
EPA	$410,000	$0	$320,000	$0	EPA Trash Free Waters Program	Marine Pollution
DOD/Navy (OM,N)	$2,555,458	$0	$2,401,000	$0	Equipment/training	PE 0702856N, BLI 45N40
DOD/Navy (RDTE,N)	$2,134,127	$0	$1,261,026	$0 upgrades	New waste technology T&E	PE 0603721N, BLI 0401
DHS/USCG*	$204,108,000	$0	$207,199,000	$0	Marine Environmental Protection (MEP) activities include regulatory enforcement, pollution prevention and response, recovery and investigations. See Section 6 for a more comprehensive discussion.	Marine Environmental Protection Missions
DOI/BSEE	$55,732	$0	$107,240	$0	Conduct inspections, and produce outreach and training materials.	Environmental Enforcement
DOS/OES/OPA	$0	$0	$1,000,000	TBD but not a requirement of the ongoing competition.	FY 2017 Grants – Marine Debris ($750,000) FY 2017 Grants – Removal of ALDFG ($250,000)	19.017 – Environmental and Scientific Partnerships and Programs
MMC	$19,278	$0	$11,163		Research projects and workshop funds	Research Grants

* In order to display budget allocation by Mission-Program, USCG uses an activity-based cost model that averages past expenditures to forecast future spending. Discretionary budget authority for the Marine Environmental Protection (MEP) mission-program contributes, in part, to marine debris activities in this table. MEP activities include enforcement of pollution protection regulations and marine pollution response, recovery, and investigation.

Please note that several IMDCC agencies conduct activities within multiple programs, offices, and projects that are indirectly related to marine debris efforts. They do not receive funding specific to marine debris in their annual appropriations but instead receive funding by missions or programs. This complicates extracting the exact funding amount related to marine debris within these integrated actions.

Appendices

A. Overview of the Interagency Marine Debris Coordinating Committee

B. Federal Authorities by Agency

C. NOAA Marine Debris Program-funded projects

D. Acronyms

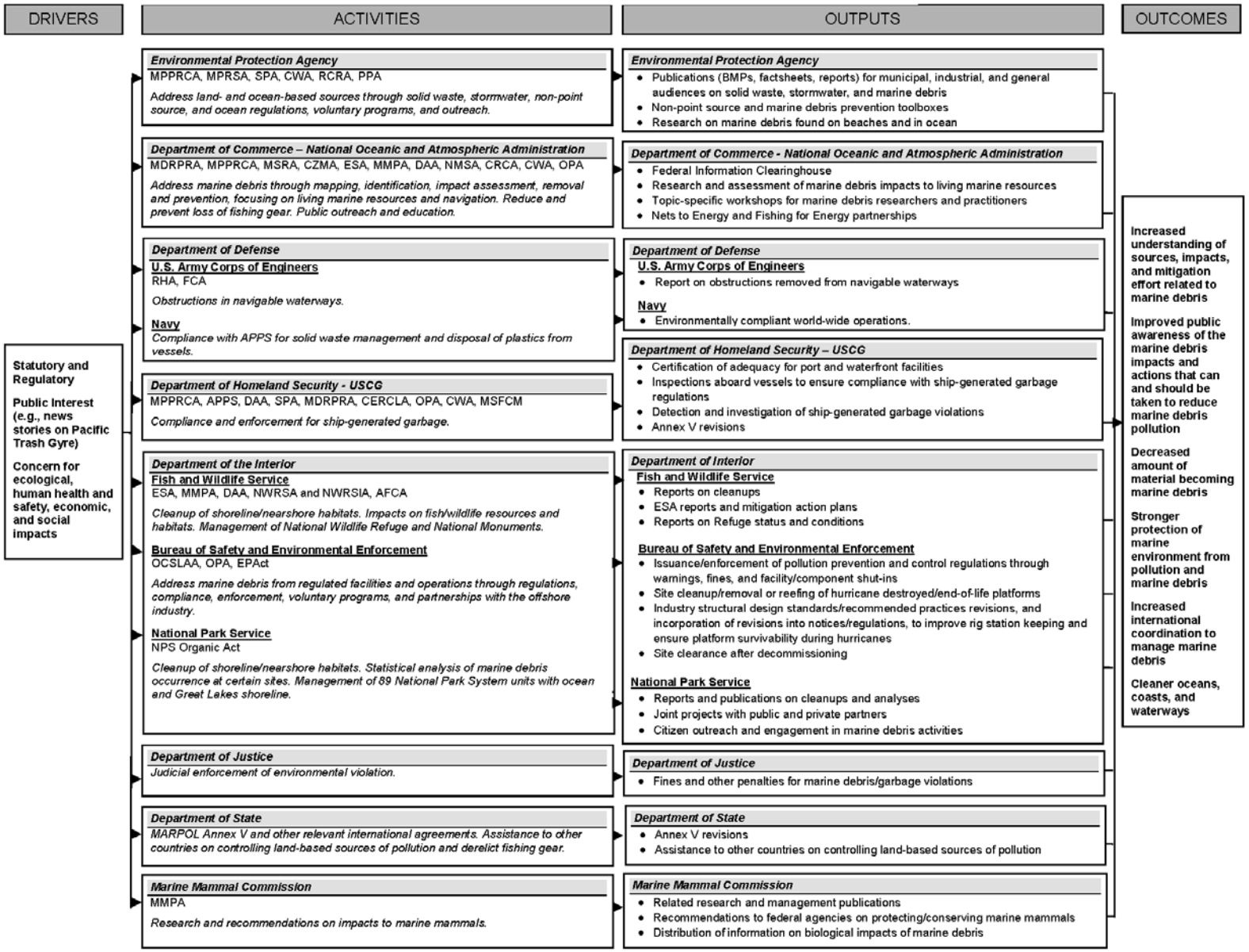
Appendix A. Overview of the Interagency Marine Debris Coordinating Committee

Figure 1 shows the overall drivers for Federal agencies to address marine debris and lists, in a concise format, the related activities and outputs of each agency that sits on IMDCC. IMDCC's outcomes are also included.

Figure 1 Acronyms

AFCA	Anadromous Fish Conservation Act
APPS	Act to Prevention Pollution from Ships
CRCA	Coral Reef Conservation Act of 2000
CWA	Clean Water Act
CZMA	Coastal Zone Management Act of 1972
DAA	Driftnet Act Amendments of 1990
EPAct	Energy Policy Act of 2005
ESA	Endangered Species Act of 1973
FCA	Flood Control Act of 1954
MDRPRA	Marine Debris Research, Prevention, and Reduction Act
MMPA	Marine Mammal Protection Act
MPPRCA	Marine Plastic Pollution Research and Control Act of 1987
MPRSA	Marine Protection, Research, and Sanctuaries Act of 1972
MSRA	Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006
NMSA	National Marine Sanctuaries Act
NPS Organic Act	National Park Service Organic Act
NWRSA	National Wildlife Refuge System Act of 1966
NWRSIA	National Wildlife Refuge System Improvement Act of 1997
OCSLAA	Outer Continental Shelf Lands Act and Amendments
OPA	Oil Pollution Act of 1990
PPA	Pollution Prevention Act of 1990
RCRA	Resource Conservation and Recovery Act
RHA	Rivers and Harbors Act of 1899
SPA	Shore Protection Act
USCG	U.S. Coast Guard

Figure 1: Overview of the Interagency Marine Debris Coordinating Committee



Appendix B. Federal Authorities by Agency

Authorities listed are those that: 1) explicitly mention marine debris in their authority; 2) address sources and items that may become marine debris (e.g., plastic, fishing gear, garbage); or 3) address entities that may be impacted by marine debris. An "X" in the last column indicates that the legislation has a regulatory component.

Table 2: Federal Authorities by Agency

Authority	Explicitly mentions marine debris	Addresses sources and items that may become marine debris	Addresses entities that may be impacted by marine debris	Regulatory
Marine Debris Act, 33 U.S.C. 1951 et seq.	NOAA, USCG			
Coral Reef Conservation Act of 2000, 16 U.S.C. 6406(b)(3)	NOAA			
Coastal Zone Management Act of 1972, 16 U.S.C. 1456b	NOAA			
CERCLA 42 U.S.C. 9601, 9604, 9607		EPA, NOAA, USCG		X
Driftnet Act Amendments of 1990, 16 U.S.C. 1826		NOAA, USFWS, DOS		X
Marine Protection, Research and Sanctuaries Act, 33 U.S.C. 1401–1445 (Ocean Dumping Act) Title I & II		EPA, NOAA, USCG		X
Shore Protection Act, 33 U.S.C. 2603		EPA, USCG		X
Clean Water Act, 33 U.S.C. 1321		EPA, USCG, NOAA		X
Clean Water Act, 33 U.S.C. 1346(f), 1342, 1329		EPA	EPA	X
Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. 1801 et seq.		NOAA, USCG		X
Resource Conservation and Recovery Act, 42 U.S.C. 6901 et seq.		EPA		
Pollution Prevention Act of 1990, 42 U.S.C. 13101–13109 et seq.		EPA, NOAA		
Act to Prevent Pollution from Ships (APPS), 33 U.S.C. 1901 et seq. as amended by the Marine Plastic Pollution Research and Control Act		USCG		X

Authority	Explicitly mentions marine debris	Addresses sources and items that may become marine debris	Addresses entities that may be impacted by marine debris	Regulatory
Rivers and Harbors Act of 1899, 33 U.S.C. 407, 409, 414, 415		USACE		X
Amended Section 2 of the Flood Control Act of 1954, Sec. 208		USACE		
An Act authorizing the construction, repair, and preservation of certain public works on rivers and harbors for navigation, and flood control, and for other purposes. 33 U.S.C. 426m		USACE		X
OCS Lands Act, 43 U.S.C. 1331 et seq. and Amendments 43 U.S.C. 1801 et seq.		BSEE		X
Oil Pollution Act of 1990, 33 U.S.C. 2701 et seq. and E.O. 12777		BSEE, EPA, NOAA		X
Energy Policy Act of 2005, 42 U.S.C. 15801 et seq.		BSEE		X
Microbead-Free Waters Act of 2015, P.L. 114-114		FDA		
National Marine Sanctuaries Act, 16 U.S.C. 1431 et seq.		NOAA	NOAA	X
National Wildlife Refuge System Administration Act of 1966 & National Wildlife Refuge System Improvement Act of 1997, 16 U.S.C. 668dd			USFWS	
Anadromous Fish Conservation Act, 16 U.S.C. 757a et seq.			USFWS	
Endangered Species Act of 1973, 16 U.S.C. 1531 et seq.			NOAA, USFWS	X
Marine Mammal Protection Act, 16 U.S.C. 1402			NOAA, MMC, USFWS	X
National Park Service Organic Act (as amended and supplemented), 54 U.S.C. § 100101			NPS	X
Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. § 5121 et seq.			FEMA	X

Appendix C. NOAA Marine Debris Funded Projects in Fiscal Years 2016 and 2017

Table 3: NOAA MDP-Funded Competitive Prevention Projects

Recipient	Project Title	Funding Year	Federal Funding	Total Project Cost	State
Bow Seat Ocean Awareness Programs Inc	Marine Debris Advocacy Category in the Ocean Awareness Student Contest	2016	$31,900	$63,900	MA
Center for Alaskan Coastal Studies	Stewards Targeting Ocean Problems (S.T.O.P.): Marine Debris	2016	$86,512	$231,013	AK
Hudson River Community Sailing Inc.	Hudson Estuary Litter Prevention (HELP)	2016	$32,015	$66,164	NY
One Cool Earth	Salinas River to the Sea Litter Program	2016	$72,050	$145,880	CA
Pacific Whale Foundation	Raising Awareness of Marine Debris with an Emphasis on Tobacco Products	2016	$25,000	$100,000	HI
Pan-Isles Inc	Marine Debris Removal Education and Waste Reduction for Students in the South Mississippi Region	2016	$57,318	$123,636	MS
School District of the City of Erie (Inc)	Watershed Approach to Rid the Seas of Marine Debris	2016	$50,434	$109,246	PA
SEA Education Association, Inc.	Towards Creating a Social Norm: A Student-Designed Program to Reduce Marine Debris through Behavior Change	2016	$96,050	$242,148	MA
Sea Turtle, Inc	Lower Laguna Madre Marine Debris Awareness & Community Based Clean-up Initiative	2016	$22,565	$45,622	TX
Trash Free Maryland Corporation	Trash Pollution Solutions: A Community-Based Approach for Baltimore City	2016	$80,000	$160,514	MD
University of Georgia	Salt Marsh Soldiers Tackle Marine Debris in Coastal Georgia	2016	$31,009	$62,018	GA
University of the Virgin Islands	Pride in Our Seas, Pride in Ourselves	2016	$99,411	$99,411	VI

Table 4: NOAA MDP-Funded Educational Displays
(No displays were funded in 2017).

Location	Type of Display	Funding Year	Federal Funding	Total Project Cost	State
South Slough National Estuarine Research Reserve	Mobile exhibit	2016	$12,000	$12,000	OR
Padilla Bay National Estuarine Research Reserve	Interactive exhibit at visitor's center	2016	$15,032	$15,032	WA
Hudson River National Estuarine Research Reserve	Static display at Hudson River walk and accompanying interactive classroom toolkit	2016	$15,000	$15,000	NY
North Inlet-Winyah Bay National Estuarine Research Reserve	Static art exhibit with interactive pledges at the waterfront in Georgetown, SC and at visitor's center	2016	$15,000	$15,000	SC
Thunder Bay National Marine Sanctuary	Interactive exhibit in visitor's center	2016	$20,000	$20,000	MI

Table 5: NOAA MDP-Funded Competitive Community-Based Removal Projects

Recipient	Project Title	Funding Year	Federal Funding	Total Project Cost	State
California State University, Channel Islands	Cultivating Santa Barbara Channel Stewards	2016	$99,928	$200,188	CA
Center for Coastal Studies	Fishing for Derelict Gear in Cape Cod and Massachusetts Bays	2016	$95,283	$239,381	MA
Douglas Indian Association	Marine Debris Cleanup and Retrieval of Derelict Crab Pots from the Gastineau Channel	2016	$33,813	$68,387	AK
Galveston Bay Foundation	Galveston Bay Habitat Enhancement through Marine Debris Removal	2016	$42,500	$85,000	TX
Hawai'i Wildlife Fund	Hawai'i Nei Marine Debris Removal Project (Hawai'i, Kaua'i & Maui Counties)	2016	$85,000	$203,253	HI
Marine Board, Oregon State	A partnership for the removal and prevention of abandoned and derelict fishing vessels along the Oregon coast	2016	$55,000	$121,937	OR
Puerto Rico Department of Natural and Environmental Resources	Shipwreck and Debris Removal from Las Croabas, Icacos and Palominos	2016	$66,672	$144,804	PR
New Jersey Audubon Society (Inc)	Cape May and Beyond: Ghost Trap Removal in Delaware Bay, Cape May Reef	2016	$176,849	$366,509	NJ
North Carolina Department of Environmental Quality	Using aerial systems to inform marine debris removal strategies and monitor habitat recovery in the NCNERR	2016	$40,768	$81,799	NC
Sitka Sound Science Center Inc.	Tribal Community Marine Debris Removal in the Bering Sea Critical Habitats from Bering Straits to the Aleutians.	2016	$175,000	$364,378	AK
Southwest Wetlands Interpretive Association	Tijuana River NERR Marine Debris Clean-up and Reduction Program	2016	$90,000	$180,000	CA
State of Alabama	Alabama, Volunteer Aided, Blue Crab Derelict Trap Removal Program	2016	$36,112	$78,548	AL
State of Delaware, DNREC	Grappling the Invisible: A derelict crab pot removal pilot in Delaware Bay	2016	$90,000	$180,000	DE
University of Wisconsin System	Increasing the Efficiency of Locating and Removing Ghost Nets in the Upper Great Lakes	2016	$36,599	$73,253	WI

Table 6: NOAA MDP-Funded Competitive Research Projects

Recipient	Project Title	Funding Year	Federal Funding	Total Project Cost	State
Texas A&M University-Corpus Christi	Quantifying and Characterizing the Mississippi River's Contribution of Microplastic Debris to the Gulf of Mexico	2016	$137,113	$274,429	TX
Arizona State University	A screening-level ecological risk assessment for microplastics in seafood in American Samoa	2017	$195,837	$338,440	AZ
University of Connecticut	Selective ingestion of microplastics by oysters: exposure assessment as a predictive tool for assessing the environmental risk to commercially important bivalves	2017	$257,531	$515,062	CT
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.	2017	$289,098	$578,201	NC
Woods Hole Oceanographic Institution	Assessment of Plastic Marine Debris Export Mechanisms and Risk to Sea Scallop Fisheries of the Mid-Atlantic Bight	2017	$192,690	$385,380	MA

Appendix D: Acronyms

ADV	Abandoned and Derelict Vessel
APEC	Asia-Pacific Economic Cooperation
APPS	Act to Prevent Pollution from Ships
BPA	Bisphenol A
BSEE	Bureau of Safety and Environmental Enforcement
CalEPA	California EPA
CalRecycle	California Department of Resources Recycling and Recovery
CBD	Center for Biological Diversity
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
COA	Certificate of Adequacy
COASST	Coastal Observation and Seabird Survey Team
CWA	Clean Water Act
DFG	Derelict Fishing Gear
DOC	Department of Commerce
DOD	Department of Defense
DOI	Department of the Interior
DOJ	Department of Justice
DOS	Department of State
EEZ	Exclusive Economic Zone
ENRD	Environment and Natural Resources Division
EPA	U.S. Environmental Protection Agency
EU	European Union
FEMA	Federal Emergency Management Agency
FfE	Fishing for Energy
FFS	French Frigate Shoals
FOSC	Federal On-Scene Coordinator
F/V	Fishing Vessel
FY	Fiscal Year
G7	The Group of 7
GPML	Global Partnership on Marine Litter

HI-MDAP	Hawaii Marine Debris Action Plan
ICC	International Coastal Cleanup
IMDCC	Interagency Marine Debris Coordinating Committee
IMO	International Maritime Organization
ISO	International Organization for Standardization
JTMD	Japan Tsunami Marine Debris
MARPOL	International Convention for the Prevention of Pollution from Ships
MD-MAP	Marine Debris Monitoring and Assessment Project
MDP	NOAA Marine Debris Program
MDRPRA	Marine Debris Research, Prevention, and Reduction Act
MEP	Marine Environmental Protection
MMC	Marine Mammal Commission
MOU	Memorandum of Understanding
MPPRCA	Marine Plastics Pollution Research and Control Act of 1987
MS4	Municipal Separate Storm Sewer Permits
MSD	Marine Safety Detachment
M/V	Motor Vessel
NAMEPA	North American Marine Environment Protection Association
Navy	U.S. Navy
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NGO	Non-governmental Organization
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRC	National Research Council
NWHI	Northwestern Hawaiian Islands
OES	U.S. Department of State, Bureau of Oceans and International Environmental and Scientific Affairs
OPA	Oil Pollution Act
OSLTF	Oil Spill Liability Trust Fund
PA	Preliminary Assessment
PACAREA	Pacific Area

PAME	Arctic Council's Protection of the Arctic Marine Environment Group
PBTs	Persistent, Bioaccumulative, and Toxic Substances
PCBs	Polychlorinated Biphenyls
PMNM	Papahānaumokuākea Marine National Monument
PRF	Port Reception Facility
PSI	Product Stewardship Institute
RNSP	Redwood National and State Parks
SAR	Synthetic Aperture Radar
SOLAS	International Convention for the Safety of Life at Sea
TFW	Trash Free Waters
T/V	Training Vessel
UAS	Unmanned Aircraft Systems
UN	United Nations
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USCGC	U.S. Coast Guard Cutter
USFWS	U.S. Fish and Wildlife Service
VMDRP	Virginia Marine Debris Response Plan
WCGA	West Coast Governors Alliance Training Vessel

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