



# **2010-2011 PROGRESS REPORT ON THE IMPLEMENTATION OF THE MARINE DEBRIS RESEARCH, PREVENTION, AND REDUCTION ACT**

*Interagency Marine Debris Coordinating Committee | October 2012*

Congressional Report requirement as stated in Marine Debris Research, Prevention and Reduction Act, 33 U.S.C. 1954.

This Congressional Report was developed by the Interagency Marine Debris Coordinating Committee and produced by the National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce to fulfill requirements of the Marine Debris Research, Prevention and Reduction Act, 33 U.S.C. 1954.

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*The Hawaiian Islands are a hotspot for marine debris accumulation due to their location within the North Pacific oceanic currents. Derelict fishing gear and assorted debris from distant locations frequently wash ashore and impact the native habitats and organisms of Hawaii.*



Photo: NOAA Marine Debris Program

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## ACRONYMS

APPS	Act to Prevent Pollution from Ships	ISO	International Organization for Standardization
BSEE	Bureau of Safety and Environmental Enforcement	MA	Mission Assignment
CWA	Clean Water Act	MARPOL	International Convention for the Prevention of Pollution from Ships
DFG	Derelict Fishing Gear	MDP	NOAA Marine Debris Program
DOC	Department of Commerce	MDRPRA	Marine Debris Research, Prevention, and Reduction Act
DOD	Department of Defense	MEPC	Marine Environment Protection Committee
DOI	Department of the Interior	MMC	Marine Mammal Commission
DOJ	Department of Justice	MOU	Memorandum of Understanding
DOS	Department of State	MPPRCA	Marine Plastics Pollution Research and Control Act
EPA	U.S. Environmental Protection Agency	NASA	National Aeronautics and Space Administration
ESF	Emergency Support Function	NOAA	National Oceanic and Atmospheric Administration
FAD	Fish Aggregating Device	NRF	National Response Framework
FEMA	Federal Emergency Management Agency	NRP	National Response Plan
FfE	Fishing for Energy	NWR	National Wildlife Refuge
FWS	U.S. Fish and Wildlife Service	NWSC	Northwest Straits Commission
GCFI	Gulf and Caribbean Fisheries Institute	USACE	U.S. Army Corps of Engineers
IAA	Inter-agency Agreement	USCG	U.S. Coast Guard
ICC	International Coastal Cleanup		
IMDCC	Interagency Marine Debris Coordinating Committee		
IMO	International Maritime Organization		

*A NOAA diver removes a nest of derelict fishing gear. Abandoned and derelict fishing gear not only impacts the marine environment, but it can also pose a navigational hazard to vessels.*

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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 2010 and December 2011 to address marine debris, as mandated by the Marine Debris Research, Prevention, and Reduction Act (MDRPRA; 33 U.S.C. 1951 et seq.). This is the second Progress Report since the publication of the Interagency Report on Marine Debris Sources, Impacts, Strategies, and Recommendations (Interagency Report), submitted to Congress in August 2008.

The 2008 Interagency Report 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. This progress report includes all of the information requested in the MDRPRA, Section 5(c)(2), entitled "Annual Progress Reports."

Section 2: provides a brief overview of marine debris and its impacts, the history of the IMDCC, and the mandated purpose of this Progress Report.

Section 3: provides a review of multi-agency and individual agency activities from those agencies currently represented on the IMDCC, and associates each activity with a recommendation from the Interagency Report.

Section 4: provides an update on the status of the Federal Information Clearinghouse, currently in development within the National Oceanic and Atmospheric Administration.

Section 5: is a review of the NOAA Marine Debris Program, which was chartered in the MDRPRA, from January 2010 to December 2011.

Section 6: is a review of USCG activities pertaining to marine debris, from 2010 to 2011.

Section 7: summarizes Federal agency spending on marine debris activities for FY 2010 and FY 2011.

This section also addresses the means by which IMDCC priorities are determined. The appendices contain specific information on the recommendations from the initial Report to Congress, an overview of the IMDCC, relevant Federal agency authorities, and information on MARPOL Annex V violations.



*Volunteers at Anacostia Park in Washington, D.C. participate in the International Coastal Cleanup (ICC) event. The ICC is the largest global volunteer event on behalf of our world's oceans and waterways. On the third Saturday each September, volunteers join forces to clean up marine debris from inland to coastal regions.*

## 2.0 INTRODUCTION

### 2.1 *Overview of the Issue*

Marine debris is a pervasive problem along shorelines and in coastal waters, estuaries, and oceans throughout the world. For purposes of the Marine Debris Research, Prevention, and Reduction Act of 2006 (MDRPRA) only, 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 the Great Lakes. Marine debris can kill or injure marine and coastal wildlife; degrade habitats; interfere with navigation safety; cause economic loss to maritime industries, fishing, and coastal communities; and negatively impact human health. These adverse impacts have been documented all over the world. Man-made persistent objects like fishing gear, plastic bags, food wrappers/containers, and beverage bottles are elements of our daily lives; however, when these objects are abandoned or disposed of improperly, they may enter the marine or coastal environment and become marine debris. As production and use of these objects increases globally, the challenge of containing and properly managing them becomes ever greater.

The significant economic, ecological, and human health and safety impacts described above vary in scope and intensity based on the debris type (e.g., plastic bags, miscellaneous plastics, derelict fishing gear, or shipping containers), location (e.g., floating in shipping lanes or resting on sensitive habitats like coral reefs), and condition. Direct economic effects from marine debris can be measured through different sectors, including analysis of impacts on tourism, losses in commercial fishing catch revenues, loss of fishing gear, damaged vessels, and human injuries. For example, medical debris washing on shore in New Jersey in 1988 resulted in loss of tourism income estimated between \$700 million and over \$3 billion (in 2010 US\$). Marine debris can also cause adverse impacts on aquatic ecosystems, such as coral reefs, wetlands, fish habitats, beaches, and breeding grounds and corridors used by migratory species. Marine debris can affect species directly, by entangling or smothering of marine and coastal wildlife, or indirectly, through changes to their habitat. For example, in a study of endangered green sea turtles, 23 of 38 stranded animals were shown to have ingested anthropogenic debris, which can be mistaken for food. In addition, marine debris can endanger human health and safety both directly, such as injuries to beachgoers from a broken bottle, or indirectly, such as abandoned fishing nets and lines that disable or damage vessel propulsion systems. Recent research also shows that plastic debris is a potential vector for the transfer of persistent, bioaccumulative, and toxic pollutants (PBTs) from the water to the food web, potentially increasing risk to humans and marine species. Because of the extremely long lifetime of plastic in the ocean and other aquatic environments, prevention strategies are vital to minimizing these risks.

Marine debris originates from both land-based and ocean-based sources (Table 1). People and their actions, whether intentional or accidental, are the source of most marine debris. Thus, it is important to identify both the origin of the debris and the types of activities that generate and convey marine debris,

in order to educate the public about how improperly managed trash, litter, and other items can affect marine and coastal environments.

**TABLE 1. POTENTIAL SOURCES OF MARINE DEBRIS**

Land-based Sources of Marine Debris	Ocean-based Sources of Marine Debris
<ul style="list-style-type: none"> <li>• Municipal landfills</li> <li>• Transport of litter and waste (on land or on waterways)</li> <li>• Stormwater discharge</li> <li>• Industrial and manufacturing activities</li> <li>• Debris generated in coastal and inland zones from improper waste management</li> <li>• Natural events</li> </ul>	<ul style="list-style-type: none"> <li>• Merchant shipping, ferries, and cruise liners</li> <li>• Fishing vessels</li> <li>• Public vessels</li> <li>• Private vessels</li> <li>• Offshore oil and gas platforms and drilling rigs</li> <li>• Aquaculture installations</li> <li>• Natural events</li> </ul>

The problem of marine debris must be dealt with using a comprehensive approach that is local in scale, global in scope, and focused on prevention at the source. The issue can be linked to a lack of awareness regarding the impacts of marine debris and appropriate disposal practices, a lack of interest in following the appropriate practices, or an inability to follow appropriate practices due to lack of infrastructure or high costs. Moreover, the most successful solution requires a mobilization of public- and private-sector actions resulting in a change in attitudes and practices that will prevent marine debris at its source. This solutions-based approach to prevention of marine debris is effective when coupled with response, research, and coordination to address the inevitable continued presence of debris in the environment.

## 2.2 *Interagency Marine Debris Coordinating Committee Overview and History*

While numerous programs have been created to address various aspects of the marine debris problem since the 1970s, the Federal Government did not take a holistic approach until the 1980s. During the late 1980s, efforts to increase coordination among stakeholder agencies included the creation of the Interagency Task Force on Persistent Marine Debris, the release of the Task Force's Report on Marine Debris (1988 Report of the Interagency Task Force on Persistent Marine Debris), and the passing of the Marine Plastic Pollution Research and Control Act of 1987 (MPPRCA). The MPPRCA created a Marine Debris Coordinating Committee, which met sporadically over the years as agencies moved forward to implement the Task Force report. Federal agencies implemented some of the Report's recommendations for additional marine debris research, monitoring, and removal as well as fostering stewardship of the ocean. Although individual agencies created and continued programs to address marine debris, the Committee did not maintain a regularly coordinated interagency approach to address marine debris prevention; instead, interagency workgroups met periodically to discuss domestic and international activities for marine debris. In 2004, the Marine Debris Coordinating Committee was re-established through the Ocean Action Plan and renamed the Interagency Marine Debris Coordinating Committee (IMDCC). Coordination among Federal agencies became more consistent, and the IMDCC's mandate was codified through the passage of the MDRPRA in 2006.

The role of the IMDCC is to develop and recommend comprehensive and multi-disciplinary approaches to reduce the sources and adverse impacts of marine debris on the nation's marine and coastal environment, natural resources, human health and public safety, and the economy. The objective of the IMDCC is to coordinate a comprehensive program of marine debris research, prevention, reduction,

and removal activities among Federal agencies, in cooperation and coordination with nongovernmental organizations, industries, universities, research institutions, States, Tribal Governments, and other nations, as appropriate. The IMDCC provides the mechanism to ensure that these agencies increase their coordination to address marine debris. In addition, Federal agencies within the IMDCC continue to address aspects of marine debris pertinent to each agency's mandates and capabilities (see Table B.1 in Appendix B). For specific agency mandates see Appendix C.

The MDRPRA established reporting requirements for the IMDCC that include submitting a preliminary Report to Congress on marine debris impacts and strategies, followed by progress reports to Congress every 2 years on the implementation status of the strategies and recommendations presented in the first report. The first IMDCC Report to Congress, submitted in August 2008, laid out a comprehensive strategy to address marine debris. The strategy relied on a coordinated approach among partners to support prevention, response, research and development, and other coordinated marine debris activities. In the 2008 report, the IMDCC described the sources and impacts of marine debris and the challenges associated with their characterization. The report also discussed the activities to address marine debris that had occurred over the past 20 years, including activities recommended in the report of the 1988 Interagency Task Force on Persistent Marine Debris. Finally, the 2008 IMDCC Report to Congress included 25 recommendations aimed at guiding the Federal Government's strategies for marine debris. These recommendations were intended to be broad in scope, address the different mandates and policies associated with debris issues, and promote collaboration among Federal agencies and partners. Recommendations were organized around four themes encompassing the following topic areas: (1) marine debris prevention through education and outreach, legislation/regulation/policy, and incentive programs; (2) response to debris already in the environment through enforcement and cleanups; (3) research and technology development to assess next steps, address gaps, reduce or prevent material from entering the marine system, and mitigate impacts; and (4) cross-theme efforts that foster coordination.

### *2.3 Charge to the Interagency Marine Debris Coordinating Committee for Progress Reporting*

The IMDCC was charged by the MDRPRA to submit Progress Reports to Congress, designed to evaluate United States and international progress in accomplishing the purpose of the MDRPRA, no later than 3 years after the date of the enactment of the MDRPRA, and biennially thereafter. The MDRPRA requires the Progress Reports to include the following items:

- The status of implementation of any recommendations and strategies of the Committee and analysis of their effectiveness. This progress report provides an update to the 2010 Report to Congress, which included an overview of IMDCC actions, multi-agency initiatives, and individual agency activities that support the recommendations outlined in the 2008 report;
- A summary of the marine debris inventory maintained by the National Oceanic and Atmospheric Administration (NOAA);
- A review of the NOAA program authorized by Section 3 of the MDRPRA, including projects funded and accomplishments relating to reduction and prevention of marine debris;
- A review of U.S. Coast Guard (USCG) programs and accomplishments relating to marine debris removal, including enforcement and compliance with the International Convention for the Prevention of Pollution from Ships (MARPOL) requirements; and
- Estimated Federal and non-Federal funding provided for marine debris and recommendations for priority funding needs.

This Progress Report provides an update to the 2010 Report to Congress, which included an overview of IMDCC actions, multi-agency initiatives, and individual agency activities that support the recommendations outlined in the 2008 report.

The NOAA Marine Debris Program (MDP) was formalized by the MDRPRA, which set specific activities and debris types to be addressed. The MDP investigates and solves the problems that stem from marine debris through research, prevention, and reduction activities, in order to protect and conserve our Nation's marine environment and ensure navigation safety. Section 5 of this report outlines the activities and focus areas of the MDP from 2010 through 2011.

In fulfillment of the USCG's responsibilities under the Act to Prevent Pollution from Ships (33 U.S.C. 1901-1915 (1996); APPS) and the mandate of the MDRPRA, the USCG works to implement MARPOL, ensure compliance among the regulated community, and take action against violations. The USCG helps to reduce the amount of debris in the environment through its pollution prevention mission and its assistance to interagency partners; in addition to its operational activities, the USCG works diligently to promote international action against marine debris and marine debris awareness among the regulated public. Section 6 discusses the USCG's activities in these areas.

Federal agency funding is identified in Section 7. This section also describes the means by which the IMDCC sets annual priorities and highlights the Committee's coordination role among agencies with differing mandates.





*Microplastics, debris categorized as pieces of plastic less than five millimeters in length, are an emerging topic in the field of marine debris research. These small bits of plastic make up the majority of items found in the “Great Pacific Garbage Patch,” where they float suspended in the water column.*



*Nets, fishing line, crab pots, and lobster traps are types of derelict fishing gear that can negatively impact marine habitat and entangle marine life.*

### 3.0 IMPLEMENTATION STATUS OF 2008 RECOMMENDATIONS

In its 2008 Report to Congress, the IMDCC presented 25 recommendations (Appendix A) intended to guide the Federal Government's strategies with respect to the problems of marine debris. These broad recommendations were intended to be undertaken both individually by agencies and collaboratively through the IMDCC. The recommendations were organized around the following four themes: (1) marine debris prevention, (2) response to debris already in the marine environment, (3) research and development, and (4) cross-theme efforts that foster coordination.

Federal agencies of the IMDCC are independently and collaboratively involved in a range of diverse projects addressing the four themes of the 2008 report. This Report focuses on the priority themes and projects of the IMDCC and each agency over the last 24 months (January 2010 to December 2011). This Progress Report on the status of implementing the 2008 recommendations includes descriptions of activities undertaken by the IMDCC itself, through multi-agency cooperative initiatives, and by individual agencies.

#### 3.1 *Interagency Marine Debris Coordinating Committee*

The IMDCC continued to coordinate a comprehensive program of marine debris activities through its member agencies throughout 2010 and 2011. Quarterly IMDCC meetings were held to strengthen collaboration and coordination among the Federal agencies. Following the development of the action plan for 2009, the IMDCC successfully implemented the recommended priority marine debris activities. The four recommendations implemented as priority activities by the IMDCC incorporated the prevention, research, and coordination themes.

In 2010 and 2011, the IMDCC continued to serve as a central point for coordinating Federal efforts to develop new policies, strengthen existing policies, and identify new research topics or projects [Recommendation 8.3]. A newly proposed initiative would have the IMDCC serve as a coordinating body for the Federal Government's engagement with marine debris resulting from the March 2011 tsunami that impacted Japan, but details are currently under discussion [Recommendation 8.2].

#### 3.2 *Multiple-agency Initiatives*

In addition to the IMDCC efforts described above and the individual-agency efforts described below, there have been a number of multi-agency initiatives over the last 24 months. These initiatives have focused on the themes of prevention, response to debris already in the marine environment, and fostering coordination.

NOAA, Environmental Protection Agency (EPA), Fish and Wildlife Service (FWS), and the

Marine Mammal Commission (MMC) partnered to plan, coordinate, and execute the Fifth International Marine Debris Conference that took place March 20-25, 2011, in Honolulu, Hawaii, in cooperation with the United Nations Environment Programme – UNEP. These IMDCC agencies, along with the United Nations Environment Programme and other organizations, brought together 440 participants representing 38 countries. Attendees participated in workshops and field trips, heard technical and policy sessions over 4 days, and saw over 30 informative posters. Keynote speakers included Jean-Michel Cousteau, Senator Daniel Inouye (HI), Representative Sam Farr (CA), and ocean rower Roz Savage. Conference participants refined and endorsed by acclamation the Honolulu Commitment, which outlines 12 actions to reduce marine debris. Participants and a group of rapporteurs also worked to revise the Honolulu Strategy, a global framework to prevent and manage marine debris, which was published in March 2012.

Continuing an effort that has gone on for over a decade, NOAA, FWS, USCG, and other cooperating agencies and groups removed derelict fishing nets from the Papahānaumokuākea Marine National Monument (PMNM) in 2010 and 2011. Over 706 metric tons of derelict nets have been removed from coral habitat and shorelines since 1996 and 35 metric tons were removed during this report period.

In 2011, the International Maritime Organization's (IMO) Marine Environment Protection Committee (MEPC) adopted amendments to Annex V to MARPOL. MARPOL Annex V addresses the discharge of garbage generated during the normal operation of ships. These amendments were the culmination of five years of work, and among other technical modifications, they changed the structure of the Annex from one prohibiting the discharge of a few types of garbage (e.g., plastics) and allowing discharges of other garbage types (in some cases with restrictions, such as minimum distance from shore), to one that generally prohibits the discharge of garbage from ships except as provided in the Annex. The MEPC is developing guidelines for the implementation of the revised Annex V and these should be finalized by the amendments' entry into force date of January 1, 2013. The USCG coordinated an interagency working group which provided U.S. input on both the amendments and guidelines. The working group included NOAA, EPA, Department of State (DOS), Department of Defense (DOD), and Department of Justice (DOJ). In another IMO effort to address issues related to marine debris, EPA coordinated an interagency working group that provided input for revisions to guidance on spoilt cargo management as part of a joint MEPC–London Convention Correspondence Group.

In 2010, with the assistance and support of all of the countries bordering the Wider Caribbean Area (which includes the entire U.S. portion of the Gulf of Mexico and the Atlantic Ocean and Caribbean Sea bordering Florida and U.S. Island Territories), the USCG, NOAA, DOS, U.S. Navy (Navy), and EPA coordinated the submittal of a proposal to the IMO MEPC to bring the MARPOL Annex V Wider Caribbean Area Special Area (WCRSA) into effect. With the notification that reception facilities for Annex V ships' waste were available, the MEPC agreed that the WCRSA would come into effect on May 1, 2011. The USCG developed and presented an international workshop on MARPOL and reception facilities for over 20 Wider Caribbean Region Countries.

The tragedy of the March 2011 tsunami in Japan had far-reaching effects that included the U.S. West Coast and Hawaii. As tsunami waters receded from land, much of what was in the inundation zone washed into the Pacific Ocean. Heavier materials sank close to shore while the buoyant materials floated and comprised the debris fields visible in satellite imagery and aerial photos of the waters surrounding Japan shortly after the tsunami. While the tsunami debris represents a small percentage of marine debris that normally washes up on U.S. shores, since March 2011, the Federal Government has been actively engaged in taking extra steps to address this issue in partnership with States, local governments, and other stakeholders. NOAA is leading efforts with IMDCC partners to collect data, assess the debris, and reduce possible impacts to our natural resources and coastal communities. Interagency efforts to address the debris conducted in 2011 are described throughout this report.

### *3.2.1 Environmental Protection Agency*

EPA has a unique capacity, as a national regulatory agency with 10 regional offices and programs ranging from ocean and coastal protection to solid waste and stormwater management, to address marine

debris at the source, as it moves through the watershed, and as it settles in the marine environment. Recognizing the role EPA programs and mandates play throughout the marine debris pathway, EPA identified prevention as the primary theme for its Marine Debris Prevention Program. EPA focused on maximizing the agency's ability to fulfill both regulatory and non-regulatory mandates for marine debris prevention through its Offices of (1) Resource Conservation and Recovery, (2) Wastewater Management, (3) Pollution Prevention and Toxics, and (4) Wetlands, Oceans, and Watersheds [Recommendation 2.2]. EPA also served as the lead for the National Ocean Policy (NOP) marine debris workgroup, helping to develop actions related to mitigating marine debris [Recommendation. 2.2].

EPA promoted prevention of marine debris through the development of various marine debris outreach materials, including an urban-coastal connection lesson plan for students in grades 4 through 7, an urban-coastal connection factsheet, an interactive game, and a web brochure for the Agency's online "Marine Debris Prevention Toolkit" [Recommendation 1.2]. EPA continued to revise its Marine Debris website to provide up-to-date information and public awareness of marine debris as well as Agency efforts to address the problem [Recommendation 1.2]. The Agency also posted disposable bag FAQs on its website to highlight EPA's support of strategies to reduce pollution at the source.

EPA supported public awareness campaigns and improved external outreach by partnering with other organizations on prevention of marine debris. Some examples include EPA sponsorship and participation in the Ocean Conservancy's annual International Coastal Cleanup event [Recommendations 1.3, 5.3, and 8.4], participation in the Fifth International Marine Debris Conference in Honolulu, Hawaii, and education and outreach through presentations and marine debris printed media [Recommendations 1.2, 1.3, 8.1 and 8.2]. At the EPA regional level (Region 9), the Agency convened with partners to discuss a Federal response to tsunami debris and also developed a monthly tsunami debris bulletin with NOAA.

EPA supported research efforts by completing a white paper focusing on the impacts of toxics related to plastic debris on both human health and the marine environment (manuscript in review), and by finalizing standardized marine debris monitoring protocols for use on EPA's Ocean Survey Vessel, Bold [Recommendation 6.1, 6.2]. In addition, at the Regional level, EPA funded and provided resource support for two fish tissue studies to determine toxicity of plastic marine debris to fish, compiled a Preliminary Assessment Report on North Pacific Marine Debris, and drafted an initial "Cost of Trash to Local Government Analysis."

For more information on EPA's Marine Debris Prevention Program, see [www.epa.gov/owow/oceans/debris/](http://www.epa.gov/owow/oceans/debris/)

### *3.2.2 Department of Commerce – National Oceanic and Atmospheric Administration*

NOAA has taken a lead role in conducting marine debris research, removal, assessment, and education and outreach activities. NOAA has provided support for external entities to complement agency work through grants and contracts and has focused particular effort on enhancing regional partnerships, holding workshops on technical marine debris activities to enhance collaboration and communication among stakeholders, improving education and outreach to inspire behavior change, and expanding research on the impacts of derelict fishing gear. NOAA also supported the development of marine debris actions for inclusion in the draft National Ocean Policy Implementation Plan.

A thorough overview of NOAA's marine debris activities can be found on its website, <http://marinedebris.noaa.gov>, which received over 6,500,000 hits between January 2010 and November 2011. A large part of the website is dedicated to prevention techniques for a wide variety of marine user groups. Recent NOAA prevention activities that utilize innovative tools and resources include an expanded partnership with Ocean Conservancy to create the Keep the Coasts Clear Campaign, which is a targeted public awareness and education campaign aimed to shape understanding of the impacts of marine debris on ocean health and build a strong and diverse constituency engaged in preventing and eliminating marine debris. Through the use of scientifically accurate and engaging messages, the campaign tells the story of how specific types of marine debris matter in ways that resonate with targeted audiences thereby

empowering and inspiring them to become part of the solution. NOAA has also entered into partnership with the University of Georgia to support the Southeast Atlantic Marine Debris Initiative (SEA-MDI). SEA-MDI is a three-state marine debris consortium to develop strategic regional marine debris efforts, while contextualizing the region within the U.S. to facilitate Federal efforts at prioritizing areas most impacted by marine debris. A key factor in this initiative is the use of innovative technologies and unique expertise to add culturally relevant outreach tools and information to current available resources. And finally within this prevention category, is the continuation of the Fishing for Energy (FfE) partnership between NOAA, Covanta Energy, the National Fish and Wildlife Foundation (NFWF), and Schnitzer Steel. FfE provides commercial fishermen on the East and West coasts of the U.S. free locations for the disposal of old fishing gear, which is then converted into energy [Recommendation 3.2]. To date, the partnership has collected over 700 metric tons of gear at 29 ports across the country.

During this reporting period, research and development received increased attention, particularly the standardization of marine debris monitoring methodologies. Standardized monitoring protocols were refined for marine debris found on shorelines and in surface waters. These protocols facilitate long-term, statistically valid marine debris monitoring. A multi-year research project continues with the University of Washington, Tacoma to develop protocols for collecting and analyzing water and sediment for marine microplastics [Recommendations 6.1 and 6.2]. Field protocols for monitoring all marine litter, as well as analytical protocols for determining microplastic abundance, are undergoing final testing to ensure scientific rigor and will be released in 2012. In addition, the Second Research Workshop on Microplastic Debris took place 5-6 November 2010 in Tacoma, Washington at the Center for Urban Waters. The workshop, a joint effort by the MDP and the University of Washington, Tacoma, was hosted by Dr. Joel Baker and included approximately 35 scientists whose expertise inform the issue of microplastics in the marine environment. Workshop proceedings were posted to the NOAA Marine Debris Program website in March 2012.

NOAA held eight workshops between January 2010 and December 2011 to foster coordination [Recommendation 8.1]. These workshops focused on several topics, including microplastics, regional strategic planning, and detecting and assessing the impact of derelict fishing gear. These workshops varied in intent, from assessing the state of knowledge in a field, to sharing best practices, to identifying and implementing new activities. Each workshop brought together relevant local, state, national, or international experts and produced proceedings documents. Workshops are a critically important component of the MDP's strategy to strengthen partnerships, facilitate information exchange, and serve as an opportunity to explore recent scientific research, outreach tools, and communication strategies.

NOAA co-hosted the Fifth International Marine Debris Conference in cooperation with UNEP and other IMDCC agencies in March 2011. This conference brought together the global marine debris community to heighten understanding and appreciation of the sources of marine debris, the threats posed by marine debris, and the cost to coastal communities and marine biodiversity. It served to highlight recent advances in marine debris research and encourage sharing of strategies and best practices to assess, reduce, and prevent the impacts of marine debris. The conference also provided an opportunity for the development of collaborative solutions to real problems, including specific bilateral or multi-country strategies to better integrate marine debris management strategies with product design, waste prevention, solid waste management, and maritime waste management strategies around the world. The most significant outcomes of the conference were the Honolulu Strategy and the Honolulu Commitment. The Honolulu Strategy is a framework for a comprehensive and global effort to reduce the ecological, human health, and economic impacts of marine debris globally. It is intended for use on multiple levels—global, regional, national, and local—involving the full spectrum of civil society, government and intergovernmental organizations, and the private sector. The Honolulu Commitment is a multi-stakeholder pledge to address marine debris.

### *3.2.3 Department of Defense – U.S. Army Corps of Engineers*

The U.S. Army Corps of Engineers (USACE) addresses debris both within and outside Federally-maintained navigation channels. Debris within Federally-maintained navigation channels that is obstructing navigation is the responsibility of the USACE for removal under its own authority.

With respect to a Stafford Act (Presidentially-declared major disaster or emergency) response and through a recent FEMA/USACE agreement, FEMA can now mission-assign USACE (under Emergency Support Function #3 - Public Works and Engineering) (ESF #3) to remove marine debris commonly referred to as wet debris that is outside of Federally-maintained navigation channels. 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 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 Styrofoam containers, barrels, construction and demolition debris, automobiles, i.e., anything man-made and remains resident in the water. Hazardous waste materials and receptacles are eligible, but will be removed by ESF#10, USCG or EPA. The secondary focus will be to collect eligible debris along shorelines to the mean high-tide level. All debris removal must be required as a result of a declared major disaster or emergency and meet FEMA's other eligibility requirements. This guidance is in compliance with FEMA Recovery Policy RP9523.5, Debris Removal from Waterways, dated March 29, 2010.

### *3.2.4 Department of Defense – U.S. Navy*

In the period since the 2010 IMDCC Progress Report, the Navy has maintained its efforts to prevent the introduction of marine debris into the marine environment from Navy surface ships [Theme 1 – Prevention]. Navy continued to install upgraded plastic waste processors (PWPs) on all surface warships. The PWP Mod 1 features increased capacity, greater reliability, easier repair, and no limitations on its use, even in the heaviest seas. As of the end of Fiscal Year 2011, Navy had completed 92 percent of its program to upgrade ships with older PWPs to PWP Mod 1. Navy estimates that its entire surface fleet will be upgraded by the end of Fiscal Year 2012. At the local level, Navy continues to partner with state and local authorities to assist in the removal of marine debris, as well as conduct beach and shore clean-ups at its installations [Theme 2 – Response].

### *3.2.5 Department of Homeland Security – U.S. Coast Guard*

The USCG activities focused on prevention of marine debris deposition and response to debris already in the marine environment through compliance, enforcement, and cleanups. The USCG works with the international community through the IMO and the International Organization for Standardization (ISO); it also reaches out to the American public at the local unit level, and through the Sea Partners Campaign. USCG activities are described in more detail in Section 6 of this report.

To ensure compliance with MARPOL, APPS, and associated regulations, Marine Inspectors inspect U.S. commercial vessels annually and examine foreign vessels through the USCG's Port State Control program. From 2010 to November 24, 2011, the USCG performed MARPOL Annex V examinations onboard more than 16,200 U.S. commercial vessels and more than 11,400 foreign commercial vessels [Recommendation 2.2]. The USCG ensures domestic alignment with MARPOL Annex V through the certification of facilities under the Certificate of Adequacy process (as of December

1, 2011, the USCG certifies 1450 MARPOL Annex V facilities), annual facility inspections, and harbor patrol spot checks [Recommendation 2.2]. The USCG has maintained the number of facility inspections for the past 2 years (14,441 in 2010 and 13,067 in 2011 through November 24, 2011), while the actual number of Certificate of Adequacy (COA) inspected facilities has declined (likely due to some facilities closing and other facilities consolidating or falling outside of 33 CFR 158 applicability criteria) despite an overall increase in the number of waterfront facilities (all waterfront facilities including fishing ports terminals and recreational boat marinas must provide Annex V waste reception facilities but are not subject to a COA). The trend of decreasing facility pollution incidents has continued in 2010-2011. Section 6 of this report documents other achievements of the facility compliance program.

When vessels or facilities are found to be non-compliant, the USCG pursues various enforcement actions, as appropriate, including written warnings, monetary civil penalties, actions against mariner credentials, and criminal penalties. Between 2010 and 2011, USCG undertook both criminal and civil enforcement actions for incidents of non-compliance. In the past, non-compliance detected by the USCG has included falsification of oil and garbage record books and failure to record discharges. As a result of these actions, the Federal Government secured guilty pleas and the imposition of penalties.

To provide a superior level of environmental protection, the USCG works with DOS and other Federal Government agencies to improve the international agreements and implementing laws and regulations that it enforces. As described in more depth in the multiple-agency initiatives Section (3.2) above, the USCG has chaired the U.S. interagency working group that provided input to the MEPC Correspondence Group for the preparation of the report on the review of MARPOL Annex V. In addition, the USCG has coordinated the IMO's Flag State Implementation subcommittee correspondence group working on reception facility adequacy issues and has continued to encourage the use of IMO Forms for Advance Notice and Waste Receipt as well as IMO guidance for ships and reception facilities to better manage ships' waste, including MARPOL Annex V wastes (i.e., garbage). The USCG has also conducted public meetings aimed at soliciting comments from stakeholders on improving MARPOL compliance for ships operating in waters under the jurisdiction of the U.S. and at U.S. ports and facilities [Recommendations 2.2 and 8.2].

The USCG continues its support of efforts to protect the PMNM partnership [Recommendations 5.3 and 1.2]. USCG statutory removal missions and other interagency debris removal missions are noted in Section 6.

### *3.2.6 Department of the Interior – Fish and Wildlife Service*

The FWS marine debris activities focus on the 180 coastal national wildlife refuges (NWRs) that span every U.S. state and territory. Coastal refuge staff and volunteers utilize educational and outreach materials developed by the MDP, EPA, and others to educate refuge visitors and educational groups of all ages about the dangers of marine debris to humans and wildlife and promote practices that help prevent marine debris [Recommendation 1.1 and 1.2]. Biologists and docents use stories of the refuge wildlife most affected by marine debris, including sea turtles, marine mammals, and sea birds, to make direct connections between human activities (e.g., improper trash disposal) and marine debris. These stories often include showing pictures of wildlife that have been impacted by common everyday items like bottle caps, cigarette lighters, and plastic bags. The FWS organizes their substantial volunteer base, provided by national wildlife refuge "Friends" groups and other conservation partners, to conduct International Coastal Cleanups and other events at coastal NWRs and other areas [Recommendation 1.3].

Most severely affected among the coastal NWRs are the Hawaiian Islands NWR and Midway Atoll NWR in the Northwest Hawaiian Islands, where shorelines and near shore coral reefs are continuously littered by marine debris. The small FWS staff at Midway Atoll NWR utilizes volunteers when they are available to clean debris from beaches, and often focus efforts on removing the items that present the highest entanglement risks to wildlife (i.e., fishing nets and lines). The FWS also provides logistical support to NOAA cleanup crews that access more remote areas of the PMNM [Recommendation



5.1, 5.2, and 5.3]. Midway Atoll NWR continues to support marine debris monitoring assessments meant to measure the rate of marine debris accumulation on the Northwest Hawaiian Islands [Recommendation 6.1].

The marine debris removal efforts in the Alaska Maritime NWR, which includes the Aleutian Islands, present an even greater challenge. This NWR includes hundreds of remote rocky islands spanning more than 1000 miles in extremely treacherous waters. FWS staff collaborate with other Federal and State agencies to identify the highest priority sites for cleanup, provide logistical support to volunteers, and coordinate these efforts with the State and other Federal agencies [Recommendation 5.1, 5.2, and 5.3].

The FWS also provided sponsorship support and participated in the International Marine Debris Conference in March 2011 [Recommendation 8.1]. The FWS uses the IMDCC to pursue partnerships and share information with other agencies about the FWS' trust resources affected by marine debris [Recommendation 8.3].

### *3.2.7 Department of the Interior – Bureau of Safety and Environmental Enforcement [formerly Minerals Management Service]*

In October 2011, MMS was reorganized and officially split into two agencies; the Bureau of Ocean Energy Management (BOEM) and the Bureau of Safety and Environmental Enforcement (BSEE). The Director of BSEE, under the supervision of the Assistant Secretary – Land and Minerals Management, is responsible for ensuring that the highest level of safety, performance, and environmental standards are followed in all offshore energy activities. Responsibilities for monitoring, improving, and enforcing industry's compliance with environmental standards during offshore operations have been delegated to the Environmental Enforcement Division.

BSEE will continue to focus on marine debris prevention and response as a part of mission-oriented responsibilities. In support of the 2008 Recommendations (Appendix A) BSEE has performed the following:

- Under 30 CFR § 250.300 (b)(6) BSEE prohibits lessees to dispose of any material into offshore waters [Recommendation 4.1].
- BSEE inspects facilities under its jurisdiction and enforces its regulations through written warnings, component and facility shut-ins, a Civil and Criminal Penalties Program [Recommendations 2.2 and 4.1].
- BSEE's new Environmental Enforcement Division and regional Environmental Enforcement Branch offices will monitor and enforce compliance with marine debris-related pollution regulations [Recommendations 2.2, 4.1, 4.2, and 8.4].
- BSEE and BOEM work closely with other agencies and industry on marine debris-related projects to (1) assess best practices for preventing marine debris, (2) share information to minimize marine debris, (3) leverage stakeholders' participation in marine debris prevention efforts, and (4) develop marine debris awareness videos and web-based training modules to educate oilfield personnel and the public [Recommendations 1.2 and 8.4].
- BSEE structural engineers continue to work with industry to conduct research and revise structural design standards and best practices to increase platform strength and stability, and improve rig station keeping during hurricanes; these documents and revisions have been incorporated into regulations. The resulting technological improvements and regulatory revisions should help to reduce the threat of marine debris from regulated sources [Recommendations 2.2, 4.1, and 7.1].
- BSEE's regional and district offices focused on response to marine debris in the environment through cleanup activities ranging from removal of obstructions on the seafloor to the decommissioning and removal of hurricane-destroyed facilities.
- BSEE regulations require operators to address and remove structures, equipment, and

obstructions on leases and within easements and rights-of-way following cessation of operations or prior to relinquishment. [Recommendations 2.2 and 5.1].

### 3.2.8 *Department of Justice*

DOJ continues to address the problem of marine debris through judicial civil and criminal enforcement of environmental violations leading to marine debris. Agencies such as EPA, NOAA, and the 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].

For example, in July 2010, Irika Shipping S.A. pleaded guilty to felony obstruction of justice charges and APPS garbage book and oil record book violations by concealing deliberate vessel pollution. Irika admitted to dumping approximately 23 cubic meters (approximately 6,000 gallons) of oil-contaminated sludge and bilge waste using a bypass hose during the voyage of the *M/V Iorana* from Gibraltar to Baltimore. Irika then concealed that illegal discharge by maintaining a fraudulent oil record book, repainting the flanges where the bypass hose was connected, and dumping overboard plastic bags filled with the oil-soaked rags used to clean out the tank holding the sludge. Crew members were instructed to lie to the USCG during and after inspection of the vessel while in port in Baltimore. Irika was sentenced to pay a \$3 million fine and an additional \$1 million community service payment. The chief engineer of the *M/V Iorana* was also sentenced to pay a fine and complete a term of probation.

In addition, DOJ enforcement of pollution laws such as the Resource Conservation and Recovery Act and the Clean Water Act, in addition to 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.

### 3.2.9 *Department of State*

In DOS, the Office of Ocean and Polar Affairs and the Office of Marine Conservation work to address marine debris issues of an international or transboundary scope and to raise awareness of these issues within the international community. Among the forums where DOS has been active on these issues are the IMO and its relevant committees, including the Maritime Environmental Protection Committee (MEPC). Marine debris issues are often included in discussions at MEPC and in intercessional work regarding MARPOL Annex V: Regulations for the Prevention of Pollution by Garbage from Ships. DOS, in close cooperation with NOAA, is also active with various regional fisheries management organizations that address concerns regarding derelict fishing gear and related issues.

In addition to fostering coordination on international activities, DOS administered a Marine Litter Grant Program for the purpose of reducing the amount of marine litter and debris released into specific waters in order to mitigate the environmental impact of marine litter and debris. In 2011, the program funded the Gulf and Caribbean Fisheries Institute (GCFI) to implement projects in five countries (Bahamas, Belize, Grenada, Grenadines, and Jamaica) to address land-based sources of marine debris. GCFI worked in partnership with national implementing organizations in each country to develop locally appropriate public education and outreach activities, establish litter warden programs, establish new sites for waste disposal and recycling, and design education campaigns for local leaders and law enforcement authorities about anti-littering regulations. A workshop of project partners from the five participating countries was held in November 2011 in San Juan, Puerto Rico, where participants provided updates on their projects, identified infrastructure and compliance gaps, and shared lessons learned.

### *3.2.10 Marine Mammal Commission*

Since the 2010 Progress Report, the MMC has focused its marine debris-related efforts in three main areas. First, to promote international awareness and action on marine debris impacts and needed clean-up activities, it co-sponsored the March 2011 Fifth International Marine Debris Conference in concert with other IMDCC agencies. MMC funding for this conference was used to support travel costs of participants from under-developed and developing countries that would not otherwise have been able to present the findings and results of their research and cleanup activities. The MMC's funds helped to ensure broad international participation, which included over 400 participants from 38 countries.

Second, the MMC continued to focus on promoting interagency coordination and support of marine debris clean-up and disentanglement efforts to reduce mortality and injury of Hawaiian monk seals. Entanglement in derelict fishing nets in the Northwestern Hawaiian Islands (NWHI) is one of four major threats responsible for a 50 year decline in abundance that has made this species the Nation's most endangered seal. To help focus limited agency resources, the MMC devoted a portion of its annual meeting in December 2009 to a review of monk seal entanglements and plans to continue net debris cleanup in waters surrounding monk seal pupping beaches in the NWHI. Based on meeting discussions, the MMC provided recommendations to the National Marine Fisheries Service, National Ocean Service, and USCG on funding and coordinating vessel support to maintain clean-up work in the NWHI. The MMC also continued to review and advise involved agencies on NWHI debris clean-up efforts through its membership on the Interagency Coordinating Committee for PMNM and the NWHI Coral Reef Ecosystem Reserve Advisory Council.

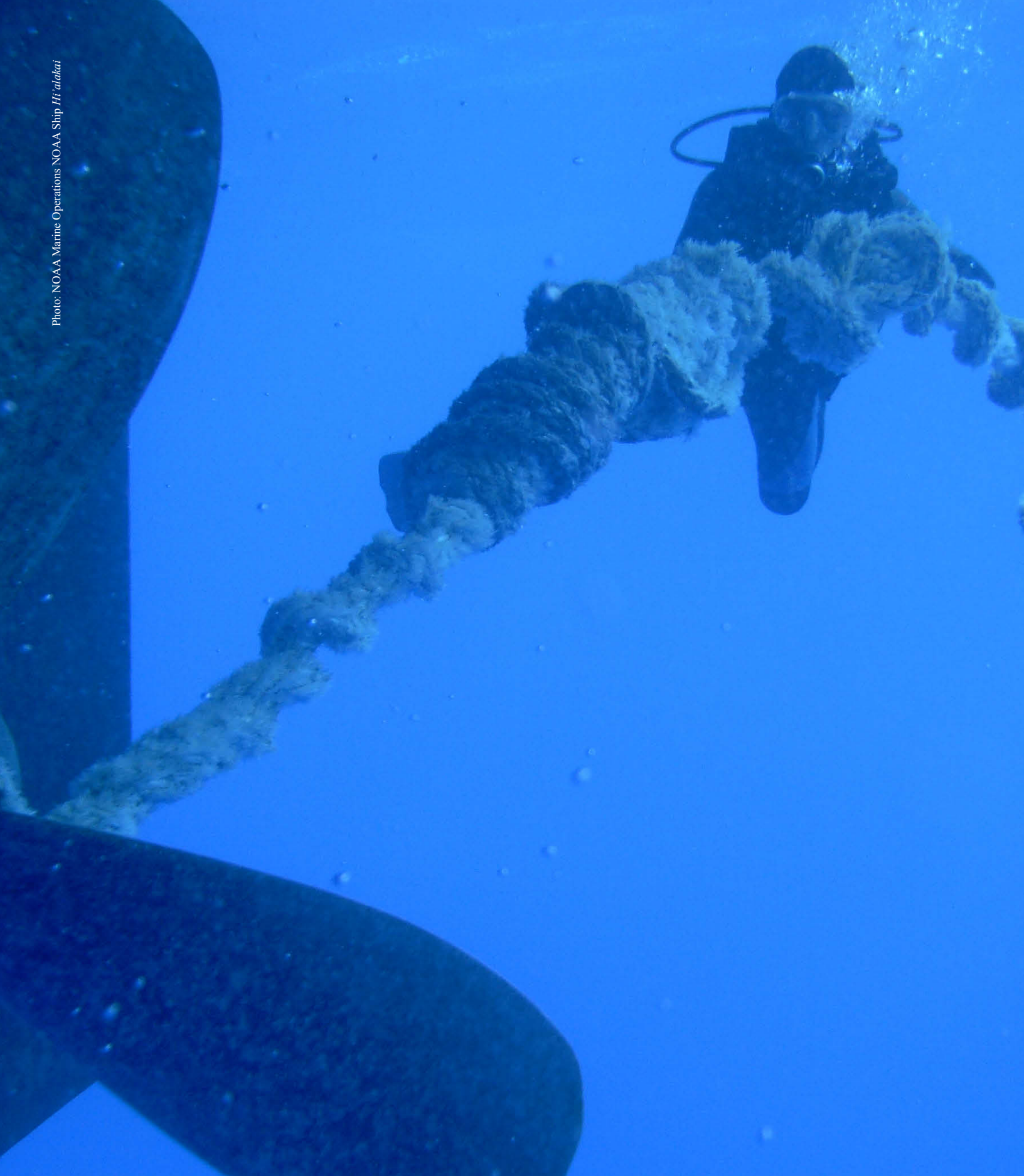
Third, the MMC encouraged and provided advice to agencies and non-governmental groups on actions to investigate the feasibility and effectiveness of using grappling systems to remove derelict gillnets and lobster traps from areas off New England where large amounts of such fishing gear have been lost. Possible efforts to use grappling systems for clean-up work are expected to be discussed at a New England Derelict Fishing Gear Workshop being sponsored by NOAA and scheduled for early 2012. In addition, the MMC continued to respond to requests from researchers, the public, and the media on the impacts of marine debris on marine mammals and marine life more broadly.



*This polluted marina shows how trash can be eventually washed into the ocean, where it becomes marine debris. Marine debris can reach the ocean through stormwater run-off. Stormwater carries debris through storm drains, which eventually leads to an outfall, into a nearby water body, and into the ocean.*

## 4.0 NOAA SUMMARY OF MARINE DEBRIS INVENTORY

In the MDRPRA (33 U.S.C. 1955), NOAA was charged with maintaining a “Federal information clearinghouse on marine debris that will be available to researchers and other interested persons to improve marine debris source identification, data sharing, and monitoring efforts through collaborative research and open sharing of data [...]” The MDP engaged in a scoping program to synthesize requirements for a powerful and useable central portal for marine debris information. By working with partners, the MDP was able to research, explore, and address data gaps and barriers to data access. The result of this effort is a design that integrates multiple methods of data discovery and presentation to give the marine debris community flexible access to diverse content through an intuitive interface. Content includes basic project information alongside relevant literature and original synthesis of marine debris topics and impacts. In 2011, the MDP entered into a partnership with the NOAA National Coastal Data Development Center to begin development of the clearinghouse, utilizing agile development and emerging technologies to realize and improve upon the original design. Initial beta testing of the clearinghouse prototype is occurring in summer 2012, with population and deployment to follow later in calendar year.



*Marine debris can pose a threat to navigation and cause costly damage to vessels. Propellers of the NOAA Ship HI'ALAKAI, shown here, became entangled by a 3-inch towing hawser. Divers aboard the Ship worked to relieve the propellers from what turned out to be 60-feet of line.*

## 5.0 THE NOAA MARINE DEBRIS PROGRAM, JANUARY 2010 TO DECEMBER 2011

The NOAA MDP was formally created in December 2006, with President George W. Bush's signing of the MDRPRA. However, as funding had first been received in FY 2005, work to create the MDP began in the summer of 2005. The mission of the MDP is to investigate and solve the problems that stem from marine debris through research, prevention, and reduction activities, in order to protect and conserve our nation's marine environment and ensure navigation safety. The MDP conducts reduction, prevention, and research activities, as well as supports grants, partnerships, and contracts to address marine debris and its associated impacts.

Since 2005 the MDP has funded over 212 projects within NOAA and with external organizations, held 14 regional, national, and international workshops and meetings, and has coordinated the development of NOAA positions on a variety of issues related to marine debris. The MDP has positioned itself as a leader on marine debris issues within NOAA and the Federal community, including chairing the IMDCC. As this is the second Report to Congress on MDP activities, it covers activities from January 2010 through December 2011.

The MDP has conducted significant activities in response to marine debris generated by the devastating Japan tsunami, including efforts to collect data, assess the debris, and reduce possible impacts to our natural resources and coastal communities. Some activities related to the tsunami debris occurred in 2011 and are described throughout this report. However, a majority of the activities have occurred in 2012 and will be included in future reports to Congress.

### 5.1 *Program Administration and Structure*

In accordance with the Act, the MDP conducts research, prevention, and reduction projects and outreach and education activities, which are implemented directly by NOAA or through grants, contracts, and cooperative agreements. The MDP has staff in several locations around the country to manage, support, and coordinate marine debris activities to ensure outcomes are in line with NOAA needs, the MDP strategic plan, and the requirements of the MDRPRA. Regional staff members work closely with local and State agencies, other NOAA offices and Federal agencies, nongovernmental organizations,

academia, private industry, and the interested public to identify and address key marine debris issues. This may occur through workshops, cleanup events, outreach events, or regular coordination meetings. The MDP is currently divided regionally with coordinators leading marine debris efforts in the Pacific Islands, Alaska, West Coast, Gulf of Mexico and Caribbean, East Coast, and Great Lakes (added in 2010).

In addition to holding workshops, coordinating activities, and working directly with partners, the MDP has also developed funding opportunities that are funded through NOAA and administrated by collaborators in the NOAA Restoration Center. These funding opportunities are for non-Federal entities to conduct removal and prevention activities. The projects focus on marine debris education, outreach, and engaging the public through cleanup opportunities. This funding opportunity benefits local communities by partnering technical expertise in habitat restoration projects whilst engaging citizens in hands-on activities that instill strong conservation values. Through the program, NOAA, its partners, and thousands of volunteers are actively restoring coastal, marine, and migratory fish habitat across the nation. From 2005 to 2011, 64 projects have been funded with total awards amounting to over \$5.6 million and leveraging an additional \$7.3 million in match from non-Federal sources.

NOAA also supports another funding opportunity through NFWF. In addition to the Marine Debris Research and Technology Grants program, NOAA and NFWF have established the Fishing for Energy grant program. This opportunity has funded 46 projects between 2005 and 2011, focusing on projects involving fishermen, ports, and marinas, expanding efforts to address derelict fishing gear, and research. Just over \$2.9 million from NOAA has leveraged over \$2.9 million in matching funds from non-Federal sources.

The MDP also supports the Marine Debris Prevention and Outreach Partnership Grant. This grant invited the public to submit applications requesting funding to establish multi-year national and regional partnerships that focus on utilizing existing networks to expand resources that address marine debris through prevention, education, and outreach activities. A second focus is the development and dissemination of innovative tools to support these activities. Partnerships address marine debris in a way that will benefit living marine resources and/or navigation safety. Current partners through this funding opportunity are Ocean Conservancy and the University of Georgia.

Finally, to provide information to a wide variety of audiences, the MDP has developed an extensive website, <http://marinedebris.noaa.gov>, which receives over 320,000 hits a month. Available on the site are a range of materials for students, the general public and ocean users, including recreational and commercial fishermen and boaters. A bi-weekly newsletter is also sent by email to over 700 subscribers highlighting recent activities, project updates, and news stories about marine debris; individuals can sign up for the newsletter via the MDP website. The MDP is strengthening its social networking activities, including the expansion of the Marine Debris Blog that generates approximately 1,000 views per month, as well as reaching out to the public through Facebook and Twitter.

## 5.2 *Program Activities*

### 5.2.1 *Research, Assessment, and State of Knowledge*

Research efforts in 2010 and 2011 focused on the topics of: (1) standardized methodologies for monitoring marine debris on shorelines and in coastal surface waters, (2) microplastic debris, including the development of standardized and robust analytical methods for determining concentrations as well as funded research and workshop involvement, and (3) quantification and assessment of derelict trap incidence and impacts in southern Florida, the U.S. Virgin Islands, Alaska, and North Carolina.

The MDP recognized the need for standardized, statistically valid methodologies for monitoring the types and abundance of marine debris in the marine environment. In 2009 the MDP began developing a standardized method for survey and assessment of marine debris on shorelines and in surface waters.



These protocols have been refined and made available to interested partners while undergoing final analysis for statistical robustness. A pilot project conducted in the Chesapeake Bay during 2010 and 2011 served as evidence of the practical use of the NOAA protocols and provides a basis for conducting baseline surveys. Furthermore, through a partnership with Versar Inc. during 2011, the MDP funded a project to evaluate the protocols for statistical robustness. Versar completed frequent sampling of shorelines and surface waters at two sites in the mid-Atlantic and their final report (issued in April 2012) includes suggestions for how often sampling should occur on shorelines to detect a change in debris abundance. The final NOAA protocols, scheduled to be published in December 2012, will be available for use by other organizations to collect baseline marine debris information in other regions. Monitoring and assessment studies provide information on the types, abundance, and drivers of marine debris and are essential for evaluating environmental impacts and measuring the effectiveness of prevention and reduction efforts.

The MDP has stayed engaged in the emerging issue of microplastic marine debris since hosting the first *International Research Workshop on the Occurrence, Effects, and Fate of Microplastic Marine Debris* in September 2008. Standardized field methods for collecting sediment, sand, and surface water microplastic samples are in development and have undergone further testing in the Chesapeake Bay and Puget Sound, in partnership with Dr. Joel Baker's lab at the University of Washington, Tacoma. Dr. Baker has developed a relatively simple, cost-effective and unbiased laboratory method to estimate the quantity of three plastics (polyethylene, polypropylene, and polyvinylchloride) in environmental samples as well as in common personal care products. This project has developed a preliminary quantification method that is in the final tier of testing. An inter-laboratory comparison exercise, planned for early 2012, will validate this method in labs across the world. Eventually these field and laboratory protocols will allow for global comparisons of the amount of microplastics released into the environment. Quantification of the problem is the first step in determining the final distribution, impacts, and fate of microplastic marine debris. In addition to the development of this methodology, the MDP has funded grant projects that are examining the tendency of chemicals to leach from and sorb to microplastic particles; these projects are in the final stages of completion. Further involvement in the field of microplastics consists of participation in the international workshop on microplastics led by the Joint Group of Experts on the Scientific Aspects of Marine Environmental Pollution (GESAMP) that convened in June 2010 to advise the United Nations on further research and engagement on this emerging issue, and organizing the *Second Research Workshop on Microplastic Marine Debris* in November 2010 to assess the research needed to understand the environmental risks of microplastics. Outcomes of this meeting include proceedings that document the potential sources, effects, stressors, and impacts of microplastics, an expanded network of researchers investigating microplastic debris, and a better understanding of the research gaps that need to be addressed before an understanding of risk can be established.

Several projects were funded in 2010-2011 to quantify and assess derelict trap incidence and impacts in southern Florida, the U.S. Virgin Islands, Alaska, and North Carolina. These projects followed a similar scope of work to allow for loose comparisons of regional differences in abundance and impact of derelict crab traps, fishing traps, and lobster traps. Each study is in the final stages of completion, and will yield estimates of the amount of derelict traps in ecologically sensitive areas such as the Florida Keys National Marine Sanctuary, coastal North Carolina tidal creeks and nearshore habitats, and the Gulf of Alaska. The projects will also yield estimates of "ghost catch" of target species, as well as estimates of non-target species catch and estimates of impacts to the local habitat. These regional differences will be explored in a synthesis paper that is currently in preparation.

The MDP has also supported small studies that close gaps in understanding, with the goal of advancing the overall state of knowledge on a given issue. For instance, funding has supported projects to assess the potential benefit of slight modifications to the structure and function of a Dungeness crab trap to lessen the amount of "ghost catch" in derelict traps. Likewise, funding has supported joint projects with NOAA NESDIS STAR, National Aeronautics and Space Administration (NASA) and the Navy to

<sup>1</sup> "Ghost catch" occurs when derelict fishing gear continues to fish, even while lost or discarded.

determine the best sensors to detect oceanic derelict fishing gear and other marine debris using satellite, aerial, and sub-sea technology.

Lastly, given the incredible breadth of potential marine debris research projects, the MDP research staff has drafted a research strategy to guide efforts over a five year time period. This strategy will be finalized in 2012 and covers FY 2012–2016. Research topics are categorized as either research of methods to estimate abundance and movement of marine debris, or research of the chemical, physical, and socio-economic impacts of marine debris. This document will provide a framework for engaging in complementary research and planning to best address the risks of marine debris to marine systems by prioritizing the most urgent gaps in research.

### *5.2.2 Removal and Recycling*

Before the MDP was established in 2005, NOAA-supported removal activities focused on the Northwestern Hawaiian Islands (site of the PMNM) because of the impact to the critically endangered Hawaiian monk seal and coral reefs, and on South Carolina and Puget Sound, where removal of abandoned vessels and derelict fishing gear, respectively, was achieved through Congressionally-directed funding. After funding was received from Congress for the MDP, removal efforts in the Pacific were expanded from the Northwestern Hawaiian Islands to include the Main Hawaiian Islands, while additional removal projects throughout the country were encouraged through the competitive NOAA Restoration Center grant program described earlier. Removal projects, focusing on large debris like derelict fishing gear that is difficult for communities to remove on their own, have taken place across the country in numerous states and territories.

Though in most areas collected debris is taken to landfills, sustainable disposal is a growing element of debris removal activities. In the Hawaiian Islands, thanks to the contribution of over 20 Government, industry, and private business partners, the “Nets to Energy” partnership takes derelict fishing nets and incinerates them to create energy. This idea was brought to the mainland, where the “Fishing for Energy” partnership now has relationships with 29 ports around the country. Both partnerships provide fishermen a no-cost, convenient location to dispose of fishing gear. Though not all the gear recovered at the mainland locations was derelict, the project partners are filling a gap identified by fishermen that was inhibiting the efficient disposal of old gear. The Nets to Energy partnership has converted over 685 metric tons of nets so far, and Fishing for Energy has recycled over 700 metric tons. In the Commonwealth of the Northern Mariana Islands, the MDP funded a nongovernmental organization, the Mariana Islands Nature Alliance, to launch a land-based debris prevention effort that installed mixed-waste and recycling bins at public beaches. The project is sustained through an Adopt-a-Bin program that recruits local businesses to sponsor the cost of weekly trash collection. In the project’s first six months, nearly eight tons of trash was kept from becoming marine debris.

In Alaska, the MDP continues to play a significant role in marine debris reduction through removal activities. Due to its location relative to currents and storm patterns, Alaskan coastlines can have very high debris deposition rates, creating a significant challenge and opportunity for removal. To date, 20 marine debris grants have directly supported the removal of approximately 340 metric tons of marine debris in the region. In many cases, these removal operations are paired with return visits to previously cleaned areas in order to establish and monitor marine debris accumulation rates and trends.

Elsewhere, the MDP has worked with local recycling firms and partners in Washington State to coordinate a program that allows ports throughout the Pacific Northwest and Alaska to ship plastic debris for sorting and recycling, thus reducing the burden on landfills. In addition, Fishing for Energy partnered with the Oregon Department of Fish and Wildlife to recycle retrieved crab pots too dilapidated to be returned to owners and re-used, as well as lines, nets, and other debris recovered during crab pot removal operations.

In 2011, Community-Based Marine Debris Removal Grants removed approximately 166 tons of marine debris from waters along the East coast, including Florida, South Carolina, Rhode Island,

Massachusetts, and New Hampshire. Black Point Marina on Biscayne Bay was the first harbor in Florida to join the Fishing for Energy initiative. On July 16th, 2011, volunteers collected derelict crab pots and other marine debris from the Bay. Gear deposited by volunteer cleanup crews, fishermen, and other harbor users in the convenient and free Fishing for Energy disposal bin at the harbor is stripped of metals for recycling and processed into clean, renewable energy at the Miami-Dade County Resources Recovery Facility, an Energy-from-Waste facility operated by Covanta Energy. The MDP and the Virginia Institute of Marine Science in cooperation with state agencies and commercial crabbers are identifying, assessing, and recovering derelict blue crab pots in the Chesapeake Bay. Commercial crabbers impacted by the failure and subsequent closure of the Virginia winter blue crab dredge fishery were integral to the development of the project, which employed 70 crabbers in removing or disabling over 28,000 derelict pots, containing 27,000 animals (e.g. crabs, fish, and turtles), and 150 nets from the Bay during three seasons from 2008 to 2011. Data from the first two seasons of the study (2008-2009 and 2009-2010) suggest that removal efforts allowed approximately 913,450 blue crabs to remain in the system, a market value of \$304,483. This project also engaged watermen to test an innovative solution to eliminate bycatch in lost pots by outfitting standard crabbing gear with an inexpensive panel made from a plant-based polymer that is fully biodegradable in the marine environment, dissolving after one season of use. This project engaged local stakeholders in supporting the recovery of an economically and culturally valuable fishery and exemplifies the solution-oriented work that the MDP would like to continue to support.

In the Great Lakes in 2010, the MDP partnered with the NOAA Restoration Center and Great Lakes Restoration Initiative to fund the first Great Lakes region marine debris removal project. In a heavily urbanized area, the Detroit Wayne County Port Authority along with Friends of the Rouge River, AKT Peerless Environmental Services, and 12 other partners, worked to remove marine debris in a once underappreciated area. Fordson Island is located in the Rouge River just upstream of the Detroit River in Michigan. The Rouge River watershed is the oldest and most heavily populated and industrialized area in southeast Michigan. With funding from NOAA, volunteers cleaned up the shoreline and jobs were created to remove abandoned and derelict vessels in the nearshore area. To date, 21 derelict boats have been removed along with approximately 40 tires and other surface debris from the island (through five volunteer removal events) for a combined total of 122 metric tons of debris removed.

During the reporting period, the MDP also supported removal projects in the Gulf of Mexico and Caribbean regions. In Mississippi, the Litter Free Waterways initiative operates in the lower Pascagoula River, habitat for a number of threatened and endangered species, which benefit from the removal of litter and debris from the waterway and banks of the river. In addition to litter, the project is responsible for the removal of white goods (e.g. refrigerators, stoves, water heaters, etc.) from the lower Pascagoula River basin. Over the course of the 2-year project, Coastal Rivers expects to remove 20 tons of debris from no less than 50 miles of waterways. In Puerto Rico, Surfrider Foundation's Rincón chapter in collaboration with the MDP, the NOAA Restoration Center, Puerto Rico's Department of Environmental and Natural Resources, and other local partners have begun work on the project titled "Coral Reef Protection through Marine Debris Removal in two Marine Protected Areas (MPAs); Arrecifes de Tourmaline and Reserva Marina Tres Palmas." Phase I of the project is nearly complete, and in 2011, nearly 50 individuals and a handful of the island's businesses contributed to help remove nearly 6,000 lbs. of boat debris off Cayo Ron reef where there is large population of corals. The debris, remnants of a shipwreck from 1996, was covering roughly 83 m<sup>2</sup> of substrate scattered across 3.2 acres of coral reef habitat. A hydraulic underwater chainsaw was used to cut the boat hull and rudder into more manageable pieces to be taken back to land and deposited in a proper landfill. Removal of this debris will prevent any additional harm to the surrounding reef during storm events. Prior to removing the debris, 60 corals were carefully transplanted from the boat hull onto the adjacent reef. Phase II of the project includes initiating the outreach and education component of the project in 2012. In addition to removal projects, the MDP continued to provide support to USCG for on-going debris removal following Hurricane Katrina and support field activities associated with the Deepwater Horizon incident.

### 5.2.3 *Prevention, Education, and Outreach*

The MDP's prevention efforts have mainly centered on the development and dissemination of education and outreach materials and resources. These have been made available on the MDP website, <https://marinedebris.noaa.gov>, as well as at community events and conferences. These materials are free, downloadable from the website, and applicable to both traditional and non-traditional education. Materials include everything from a marine debris curriculum for grades K-12 to an educational poster for boaters on what can be legally disposed of at sea.

The focus of the MDP outreach and communication efforts is to communicate to both internal and external audiences to achieve the following objectives:

1. Improve internal and external awareness and understanding of marine debris issues to foster stewardship of our oceans and coastal waterways.
2. Improve awareness and understanding of the MDP, its mission, and its activities both within NOAA and to the general public.
3. Raise awareness of marine debris issues among national and regional policy makers.
4. Raise awareness and understanding of the MDP, its mission, and project activities specifically among national and regional policy makers.
5. Become a widely trusted resource for marine debris information nationally and internationally.

To meet these stated objectives, the MDP constantly updates education and outreach materials in order to provide the most accurate information possible. Examples of products to aid in education and prevention include: updated activity books and outreach materials for conferences and workshops, new regionally-targeted products, and updated 1-page descriptions of significant MDP activities. In 2011, as part of the monitoring and assessment project, the MDP produced an informational postcard detailing the goals and objectives of the project; this postcard is handed out to interested beachgoers encountered during field work conducted by the MDP and our partners. Prior to the beginning of the school year in fall 2011, a "Marine Debris in the Classroom" presentation was made to elementary through high school science teachers in Fairfax County, Virginia. These types of "train the trainer" outreach events are an effective method used by the MDP to expand awareness and understanding of marine debris issues. In addition to traditional and targeted audience-specific products, the MDP has created five new videos, two video public service announcements, and an audio podcast available for download from the website. In addition, the MDP and SEA-MDI out of the University of Georgia Faculty of Engineering developed the Marine Debris Tracker mobile application that can easily track and log marine debris items from a list of common debris items found on the beach or in the water; this app promotes "citizen science" and strengthens community engagement by allowing the public to record the debris location through GPS into a database. The MDP has also created a blog dedicated solely to marine debris issues to further expand the prevention campaign effort, getting approximately 1,000 hits per month. In addition, the MDP remains proud to host the annual "Keep the Sea Free of Debris" art contest that engages K-8 students to contribute artwork for a calendar and raise awareness about the global problem of marine debris. In response to public interest in and media attention to hot topics such as marine debris generated by the Japan tsunami in March 2011, the "Great Pacific Garbage Patch," and plastics as marine debris, the MDP works with researchers and experts in these areas to create resources for accurate, up-to-date information on these topics.

Specific to the March 2011 tsunami in Japan, the MDP developed a series of outreach products for both government agencies and the general public, including a general FAQs document, information explaining different modeling and prediction tools for marine debris transport, as well as information on potential concerns of debris radioactivity. In December 2011, the program set up an email address, [DisasterDebris@noaa.gov](mailto:DisasterDebris@noaa.gov), where ocean-going vessels or beach-goers could report significant debris sightings related to the tsunami. The latest information can be found on the website, <https://marinedebris.noaa.gov/tsunamidebris>.

### 5.2.4 *Workshops and Conferences*

Workshops are a significant method through which NOAA is able to gather and disseminate research results and new information, identify marine debris issues, facilitate networking within the marine debris community within a State, region, or Nation, and encourage and support actions to address marine debris. NOAA held eight workshops between January 2010 and December 2011, which focused on several topics, including microplastics, regional strategic planning, and detecting and assessing the impact of derelict fishing gear. Outcomes from these workshops included sharing best practices, documenting the state of knowledge in a specific field, and identifying new and emerging activities to be undertaken in the future. Each workshop brought together relevant local, State, national, or international experts and also produced proceedings documents. Workshops on more focused topics included:

- The 5th International Marine Debris Conference;
- West Coast Governor's Alliance;
- Potomac Watershed Trash Summit;
- Great Lakes marine debris (preliminary workshop July 2011; MDP-hosted workshop November 2011); and
- Assessing the abundance and impact of microplastic marine debris using a risk assessment framework with participants from the United States, Europe, and Asia (November 2010, Tacoma, Washington).

As noted in previous sections, in March 2011, NOAA co-hosted the Fifth International Marine Debris Conference in cooperation with UNEP and other IMDCC agencies. This conference brought together the global marine debris community to heighten understanding and appreciation of the threats posed by marine debris, and was attended by 440 participants representing 38 countries. It served to highlight recent advances in marine debris research and encourage sharing of strategies and best practices to assess, reduce, and prevent the impacts of marine debris. The conference also provided an opportunity for the development of collaborative solutions to real problems, including the Honolulu Strategy, a global framework to prevent and manage marine debris that was published in March 2012.

Along the West Coast, the MDP has worked hard to move the West Coast Governors Alliance Marine Debris Action Coordination Team (MD ACT) forward. By funding two of the team's three workshops and participating directly in organizing and leading the workshops, the MDP enabled the MD ACT to formulate a West Coast Marine Debris Strategy, and put in place the foundation for a West Coast-wide marine debris alliance.

The MDP was a proud sponsor of the 6th Annual Potomac Watershed Trash Summit held at George Mason University Founders Hall in Arlington, Virginia on October 19th, 2011. This event provided a unique venue for key stakeholders to collaborate on strategies to eliminate trash from local waterways, communities, and public lands. The Trash Summit, an element of Alice Ferguson Foundation's Trash Free Potomac Watershed Initiative, is building momentum each year and driving action, including regional public policy, best management practices, business actions, and public education. The partnership between NOAA and the Alice Ferguson Foundation is based around the mutual vision that communities can come together to prevent the improper disposal of trash before it becomes marine debris.

In July 2011, the MDP assisted in the organization of the first marine debris workshop in the Great Lakes region with the Shedd Aquarium and The Alliance for the Great Lakes. This one day event brought together knowledgeable experts and those interested in marine debris in the Great Lakes region to discuss and highlight issues of concern surrounding the problem of marine debris. One of the top issues raised at this meeting was the need to better define the issue and the need for a regional action plan. In

December 2011, the MDP organized and hosted a second workshop that had three primary objectives. The first was to establish the current state of knowledge on land-based debris, derelict fishing gear, and historic sawmill and fill debris in an effort to move forward from the July meeting. The second goal of the workshop was to establish a shared vision that each organization in attendance could work towards in addressing the marine debris problem in the Great Lakes. This will be used as the basis for an initial regional action plan. Lastly, the workshop served as an opportunity to connect Federal agencies, States, and non-governmental organizations in the region to identify potential opportunities for collaboration related to marine debris.

In November 2010, the MDP organized the *Second Research Workshop on Microplastic Marine Debris* to assess the gaps in research needed to understand the environmental risks of microplastics. Outcomes of this meeting include proceedings that document the potential sources, effects, stressors, and impacts of microplastics, an expanded network of researchers investigating microplastic debris, and a better understanding of the research gaps that need to be addressed before an understanding of risk can be established.

The MDP also planned a workshop in Portland, Maine, in February, 2012 to bring together researchers, commercial fishermen, NGOs, managers, and legislators to discuss derelict fishing gear in New England. Action teams focusing on research, stakeholder involvement, regulation, and coordination convened to develop solutions to the challenges of prevention and recovery of derelict fishing gear in this region.

In addition to the many workshops organized directly, the MDP has also participated in a number of other workshops and conferences:

- Conference session: TOS/ASLO/AGU Ocean Sciences Meeting (February 2010)
- Workshop: Port Townsend Marine Science Center's Plastics Summit (May 2010)
- Workshop: GESAMP International Workshop on Microplastics (June 2010)
- Conference session: International Association of Great Lakes Research (May 2011)
- Conference session: TOS/ASLO/AGU Ocean Sciences Meeting (February 2012)
- Conference session: Alaska Forum on the Environment – 2009, 2010, 2011, 2012

The MDP has organized and chaired sessions on marine debris at the following scientific conferences: Society of Environmental Toxicology and Chemistry, 2010 North America meeting (one session on the chemical impact of microplastics), Marine Technology Society Tech Surge 2011 (session on marine debris detection and removal approaches), Coastal Zone 2011 (two technical sessions on marine debris research and planning), and (in prep) the Society of Environmental Toxicology and Chemistry, 2012 World Congress Meeting (one session on the chemical impact of microplastics).

### 5.2.5 Partnerships

Marine debris is a global issue, but priorities to address it vary widely across the world, nation, regions, states, and communities. Understanding these differences, the MDP engages in partnerships at different levels and with different entities to ensure that efforts in a particular area are carried out at the most effective level. Many of these partnerships are mentioned in previous sections, but additional examples are discussed here.

At the international level, the MDP supports Ocean Conservancy's International Coastal Cleanup (ICC) with both funding and volunteers, as well as its annual ICC Conference for state and country coordinators and the development of an online marine debris reporting database. The ICC is a significant international effort to record data on the types of debris found on beaches and in the marine environment, with "nearly nine million volunteers from 152 countries and locations [that] have cleaned 145 million

<sup>2</sup> Ocean Conservancy, <http://www.oceanconservancy.org/our-work/marine-debris/international-coastal-cleanup-11.html> (Accessed 03 January 2012).

pounds of trash from the shores of lakes, streams, rivers, and the ocean on just one day each year.”<sup>22</sup> The MDP began another international partnership in late 2011 with the Joint GESAMP to participate in their newest global working group. GESAMP scientists have chosen to investigate microplastic debris as a potential global pollutant and vector for toxic substances. This working group involves international scientists working on all aspects of the microplastics issue, including experts from academic, industry, and government sectors. The working group is a multi-year effort that will assess microplastics as a marine pollutant by researching sources and impacts on a global scale. The MDP will provide partial funding for the group’s annual meeting and will contribute staff expertise.

The Fishing for Energy project, also mentioned in the Removal and Recycling section (5.2.2), is a unique national partnership, composed of the MDP, NFWF, Covanta Energy, and Schnitzer Steel Industries, Inc. This partnership focuses on providing ports and fishermen with free disposal facilities, collection, and transport to suitable power plants for old and derelict fishing gear. Working together, the partners identify fishing ports across the country that have a sizable fishing fleet and may need disposal options, determine if their location makes them eligible, and then reach out to form the partnership. U.S. ports can also nominate themselves to become involved. Related port overhead costs for this partnership are low, and the partners recently established a grant opportunity to help ports and their partners expand their outreach, education, and other project-related activities.

At the regional level in the state of Washington, the MDP entered into a partnership with the Washington Clean Coast Alliance to support its main coastal cleanup program, Coast Savers. Stepping in at a critical moment when funding from other sources was no longer available, the MDP, through this partnership, provided the support and funding needed to obtain supplies and materials to conduct the cleanup in 2011. This support will continue for 4 more years. In Oregon, the MDP entered into a partnership with the Oregon Dungeness Crab Commission and the Oregon Department of Fish and Wildlife to capitalize on the successful American Recovery and Reinvestment Act derelict pot removal project and continue with the removal of derelict crab pots along the entire coast. Supporting this industry-led project, the MDP provided matching funds to support the removal, and conducted outreach for the project, the highlight of which was the announcement of the project by NOAA’s Administrator, Dr. Jane Lubchenco.

In the Alaska region, the MDP partnered with NOAA National Marine Fisheries Service Auke Bay Lab scientists to conduct a 2 year study on the abundance and impact of derelict Dungeness crab pots in the commercial fisheries of Southeast Alaska. This project was done in close collaboration with the Alaska Department of Natural Resources, who provided key inputs on fishing effort and practices that informed the selection of sites for sonar survey and SCUBA diver-based data gathering and removal operations. This 2009-2010 study also resulted in the hypothesis that drove a 2011 study on potential gear modifications that could lessen the impact of pots when lost. Due to the size and scope of the Alaskan coastline, partners are critical for all elements of marine debris work. The MDP has continued strong partnerships with Gulf of Alaska Keeper in their pioneering work on outer coast removal operations. In Homer, the Center for Alaskan Coastal Studies has continued to integrate their local volunteer-based removal operations with strong community outreach and awareness building as well as state-wide outreach through their challenge grant program. The Marine Conservation Alliance Foundation is another group that has had state-wide impacts on the marine debris issue, working through local communities to contract removal and grow a data collection program to understand debris composition statistics and trends.

The MDP is working with the Southeast Atlantic Marine Debris Initiative (SEA-MDI) to strategize regional marine debris efforts and apply regional expertise to develop culturally relevant outreach tools and innovative approaches to marine debris problems through a three-state (North Carolina, South Carolina, and Georgia) marine debris consortium. This program is developing and promoting innovative technologies, including the Marine Debris Tracker, a unique mobile application for smart phones that allows users to identify and report marine debris. In 2012 SEA-MDI will be awarding mini-grants to support projects in the region focused on prevention, removal, and disposal of commercial and recreational fishing gear and land based marine debris as well as marine debris education programs for the general public and school-age children. The MDP also partners with the Alice Ferguson

Foundation on the Trash Free Potomac Watershed Initiative, which is building momentum each year and driving action, including regional public policy, best management practices, business actions, and public education. This partnership is based around the mutual vision that communities can come together to prevent the improper disposal of trash before it becomes marine debris.

In the Gulf of Mexico region in 2010 and 2011, the MDP partnered with the NASA DEVELOP program, an opportunity for students to train in the atmospheric and earth sciences, on a project that monitored marine debris dispersal using satellite-based sea surface height and sea surface anomaly data. These data were used to assess the sources and transport of debris that routinely washes ashore at the Padre Island National Seashore in Texas. The MDP also facilitated a partnership between Louisiana Sea Grant and NFWF following a compensatory restoration settlement. This project will remove and dispose of derelict blue crab traps in coastal Louisiana during the winter of 2011/2012, given the significant number of traps along the coast and the negative impacts to species and habitat. The MDP is partnering internally in the Gulf of Mexico region with the NOAA Disaster Response Center, a coastal crisis support facility and communications hub, on a project to incorporate lessons learned on marine debris following Hurricane Ike into a Gulf-wide planning and preparedness document to aid in response activities.

The Great Lakes region also engages a number of strategic partners, including the Alliance for Great Lakes to further develop marine debris monitoring protocols, the Shedd Aquarium to promote Great Lake debris issues, and the Cleveland Museum of Natural History to educate the public at conservation events. In addition, the MDP partners with Ohio Sea Grant to provide undergraduate research students an opportunity to learn about marine debris issues, and internally with the NOAA Restoration Center in the Great Lakes to help fund and implement marine debris removal projects, and to design projects through the Great Lakes Restoration Initiative.





*Artwork from the NOAA Marine Debris Program's annual "Keep the Sea Free of Debris" art contest serves as an outreach and educational tool used in our annual planner. Each year students, Kindergarten through eighth grade, submit artwork showing how marine debris impacts the ocean environment.*



*Fishing nets pulled up from the ocean column. When left in the ocean environment, derelict fishing gear can entangle, harm and even kill commercially important marine organisms through a process known as “ghost-fishing.”*

## 6.0 REVIEW OF U.S. COAST GUARD PROGRAM

Since the filing of its last Report with Congress on the status of USCG marine debris activities in 2008 and 2009, the USCG has continued to play an important role in the prevention and reduction of marine debris. Here, the USCG discusses the programs carried out in 2010 and 2011 which reflect its sustained commitment to the solutions of this persistent problem.

The USCG reduces sea-sourced marine debris by enforcing the vessel-generated waste provisions of MARPOL, APPS, and the regulations issued there under. The period between 2010 and 2011 saw further development of the USCG waste reception facilities program and its domestic and international outreach efforts. Through the continuance of its port state and domestic inspection programs, the USCG ensured adherence to the discharge requirements of APPS and worked toward the successful prosecution of those who did not adhere to those requirements.

Where the USCG has statutory authority, USCG Captains of the Port may remove vessels which pose a unique pollution risk. In furtherance of its commitment to environmental stewardship, the USCG assists its interagency partners in the removal and identification of marine debris in areas of particular ecological concern.

In addition to its operational activities, the USCG promotes international action against marine debris. On behalf of the United States and, in cooperation with the Federal interagency working group on MARPOL Annex V, the USCG provides important leadership at the IMO. Outside of the regulatory context, the USCG cooperated with international counterparts through the ISO to develop industry-wide, ship-generated garbage standards. Here again, the USCG has provided an important leadership role as chair of and ISO work group to develop waste management standards. ISO 21070, Management and Handling of Shipboard Garbage, was published in 2011 and ISO CD 16304, Port Waste Reception Facility standard, is currently in development.

The USCG continues to educate boaters and mariners about the environmental and legal consequences of marine debris deposition. The USCG continues to promote marine debris awareness among the regulated public through its Sea Partners Campaign outreach program. Taken together, the USCG's anti-marine debris activities are an essential part of the Federal government's effort to combat the pervasive problem of marine debris.

### 6.1 *Compliance and Enforcement*

### *6.1.1 Ship-Generated Garbage: Waste Reception Facilities*

The USCG continues to administer a robust compliance program to ensure the adequacy of waste reception facilities in U.S. ports and terminals and their ability to receive MARPOL Annex V wastes from oceangoing ships. These efforts contribute to the reduction of ship-sourced pollution, which is responsible for a portion of the marine debris in the oceans. The USCG verifies that domestic waterfront facilities maintain the capability of receiving garbage and wastes from oceangoing ships through its COA program. The 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 CFR § 158.400.

Through the Marine Information for Safety and Law Enforcement reporting system, the USCG is able to track facility inspection activity levels. Facility inspections for 2010 (15,027) and 2011 (15,200) remained constant at high levels and included compliance checks on safety and security related requirements, as well as MARPOL V requirements. The USCG continues to monitor and gather specific information on MARPOL reception facilities, including information relating to inspections, deficiencies, investigations, and pollution incidents directly connected to MARPOL Annex V waste streams.

The USCG continues its work to improve reception facilities. USCG issued updated guidance to field inspectors and investigators in the form of a MARPOL “job aid” in 2008, and has since conducted annual facility inspector workshops for its field units to further improve the effectiveness and thoroughness of the facility inspections. The USCG initiates an investigation whenever a report of alleged inadequate reception facilities is received. The USCG performs thorough investigations to ensure that each identified facility is in compliance with the regulations or is taking corrective action to come back into compliance. In addition, the USCG notifies the appropriate Flag State when investigating an allegation of inadequacy made by a foreign vessel. The USCG also provides a synopsis of its investigation and any action taken to the Flag State authority and to IMO for publication in its Global Integrated Shipping Information System database on PRF inadequacy reports to ensure adequate reception facilities are available at U.S. ports and terminals.

The USCG maintains a list of U.S. ports and terminals that have been issued reception facility COAs in compliance with APPS. This data is available to the public on the USCG Maritime Information Exchange and is provided to the IMO for publication on their Global Integrated Shipping Information System website which the USCG helped implement.

### *6.1.2 Ship-Generated Garbage: Shipboard Compliance and Enforcement*

The USCG ensures compliance with U.S. regulations related to marine environmental protection through inspections and boardings. In fulfillment of MARPOL Annex V obligations, the USCG inspects U.S. commercial vessels annually and examines foreign vessels through the port state control program. For recreational and commercial fishing vessels that are not required by law to be inspected, boardings (such as domestic fisheries protection activities, marine sanctuaries protection activities, and random “at sea” boardings) allow the USCG to verify environmental compliance. In 2010, the USCG performed MARPOL V examinations on approximately 12,949 U.S. commercial vessels and more than 8,370 foreign commercial vessels. In 2011 inspections included 13,657 U.S. commercial vessels and more than 9,300 foreign commercial vessels. In 2010 and 2011, the USCG conducted more than 164,000 inspections or examinations on all vessel types.

In addition, the USCG may proffer suspension and revocation charges against U.S. merchant

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<sup>2</sup> Data includes all pollution incidents, including those related to compliance with Annex V.

mariners' credentials for willful or negligent acts. Appendix D of this report provides data on the number and type of MARPOL Annex V sanctions processed by the USCG since 1991.

## 6.2 *Debris Removal*

### 6.2.1 *Statutory Activities*

The USCG's primary responsibility 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. This includes not only the dumping or discharge of oil and hazardous substances, but also cases which pose a substantial threat of discharge. The USCG's authority for responding to these incidents falls mainly under: the Clean Water Act (CWA; 33 U.S.C. § 1251 et seq.) for oil and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA; 42 U.S.C. § 9601 et seq.) for other hazardous substances not covered under the CWA. Under each of these authorities, the USCG must determine that (1) the vessels are discharging substances or pose a substantial threat to discharge, (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 incident. If the pollution can be mitigated from the vessel without its removal or destruction, this will be the primary option. The USCG also has authority under the Abandoned Barge Act (46 U.S.C. § 4701 et seq.) to remove abandoned barges under certain circumstances. When deciding upon the appropriateness of removal in the case of abandoned barges or other vessels, the threat of continued dumping is also considered. When a vessel could remain a possible location for continued dumping of oil or hazardous material, and additional damage to the environment and/or costs for cleanup would be incurred, vessel removal may be the most appropriate option.

One such initiative in 2011 was the removal of the barge DAVY CROCKETT from the Columbia River near Camas, Washington. Formerly used as an oil barge, the vessel was partially sunk on the river bank with an oil sheen stretching 14 miles downriver. The USCG, working with the Washington Department of Ecology and the Oregon Department of Environmental Quality immediately responded with pollution prevention measures and began wreck removal efforts under the National Incident Management System. The project, completed in November 2011, included the removal of over 38,000 gallons of oil products, 4850 pounds of asbestos, and 1.25 million pounds of debris from the cleanup site, in addition to the steel from the vessel which was sent for recycling.<sup>3</sup>

In cases where vessels do not pose a pollution threat, the USCG coordinates with the 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, i.e., when a vessel is not located in a navigable waterway, does not pose a pollution threat, or is a barge less than 100 GT. When state authority is acted upon, local USCG officials will monitor the status of the vessel and provide expertise to state and local officials to coordinate procedures for removal.

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<sup>3</sup> Department of Ecology News Release, November 23, 2011, <http://www.ecy.wa.gov/news/2011/329.html>

## 6.2.2 *Marine Debris Removal Associated with Hurricanes Katrina and Rita*

USCG operations in support of the 2005 Hurricanes Katrina and Rita marine debris removal efforts were conducted in four states under the auspices of the National Response Plan (NRP) (after January, 2008, the NRP was replaced by the National Response Framework (NRF)); these activities continued into 2011 and are scheduled to continue into 2012 (April –June of 2012) including execution of the final removal contracts and the demobilization of the command post.

The normal NRF Emergency Support Function for “Salvage and Debris Removal” is ESF-3, Public Works and Engineering. USACE is the lead agency for that type of support, if requested by an applicant in accordance with a Presidential major disaster or emergency declaration, as required by the Stafford Act. In this specific instance, given the scope and effect of Katrina and the combined effect of Rita and Katrina (and, later, Wilma), USACE focused its disaster response and recovery efforts on its primary missions of navigation, flood risk reduction, and ESF-3 response and recovery activities. It utilized its resources to remove sunken vessels and other obstructions from or immediately adjacent to Federally maintained navigation channels and to restore flood risk reduction features such as levees, floodwalls, and high-capacity, reliable pumping stations. Many, but by no means all, of the marine debris removals overseen by USCG after the 2005 hurricanes were outside authorized Federal navigation channels and were not impacting commercial navigation. This type of marine (wet) debris has since been discussed and considered as USACE, FEMA, USCG, and other agencies refined eligibility criteria for Federal assistance under ESF-3. USACE can now address marine debris (wet debris) outside of an authorized Federal navigation channel if a Presidential major disaster or emergency declaration is made (under the Stafford Act; 42 U.S.C. §§ 5121-5206) and FEMA determines that the wet debris needs to be removed from a channel or waterways it deems critical to local or regional area recovery. FEMA can give USACE the mission and funding to effect necessary wet debris removal.

The term “marine debris” was redefined multiple times by the various individual State Mission Assignment (MA) writers and the individual project managers during the course of the work.<sup>4</sup> Eventually, the mission was assigned to the USCG in September of 2005 as ESF-“Other” and related task orders. The USCG removed vessels and other debris from various waterways and the Gulf of Mexico in four states.<sup>5</sup> Two States, Texas and Alabama, had lesser amounts of debris and funds expended for these activities. Mississippi and Louisiana had significant amounts of debris removed. Of those two, Louisiana was a significantly larger task and presented substantial logistical and regulatory complications.

Initially, costs were covered directly by funds obligated under the actual ESF-“Other” MA. Later, FEMA substituted various Inter-agency Agreements (IAAs) for the MAs in order to streamline funding processes, but there is no substantive difference as it relates to the intention of this report, and the operations delineated below depict both MA- and IAA-funded activities.

There were three debris removal operational categories under these projects:

1. vessels (inland) of all sizes and types, from large steel barges to small recreational vessels;
2. trees, white goods (including household appliances), and construction/demolition debris such as houses, docks and other structures which were blown into the waterways (inland); and,
3. materials of types 1 and 2 located in the waters of the Gulf of Mexico.

### 6.2.2.1 *Removal Operations—Louisiana*

<sup>4</sup> It is important to note that use of the term marine debris is not synonymous with the NOAA-USCG rule promulgated 3 September 2009 defining marine debris; however, because marine debris is defined in that regulation as “For the purposes of the Marine Debris Research Prevention and Reduction Act only,” use of a different definition is appropriate in both contexts.

<sup>5</sup> No operations relating to 2008 Hurricane Gustav or Ike are addressed in the USCG section of this report.

Removal operations in Louisiana between 2010 and 2011 consisted of the development, award and execution of three contracts for the removal and disposal of “Heavy Vessels.” These vessels were defined not by weight, but because they contained or were suspected of containing internal engines/generators of sufficient size to pose a significant potential pollution threat. Removal of these vessels required the use of larger and heavier equipment which could lift the vessel in a manner which would reduce the possibility of the catastrophic release of lubricants or fuel which might result in a hull failure. Destruction and disposal of these vessels was conducted in accordance with applicable state and Federal regulations and was primarily conducted within sealed, sand bagged berms constructed for that purpose at permitted sites. Full compliance with the mandated consultation under Section 7 of the Endangered Species Act and with the mandated consultation required under section 106 of the National Historic Preservation Act was executed and documented. These three contracts resulted in the removal and disposal of 95 “Heavy Vessels.” A sonar survey of 16 square miles of Lake Pontchartrain was conducted at FEMA’s request, using USCG equipment and personnel. FEMA used the resulting data to determine whether it would fund additional state debris removal operations in the lake. A contract was developed, awarded and executed for the removal of what was estimated to be 250,000 cubic yards of storm surge generated marine debris which had collected at a bend on the Pearl River. This “Log Jam” was so large it was re-directing the course of the river, and creating an extreme navigational hazard for local recreational traffic, which is quite heavy in that area. A contract was developed, awarded and executed for the removal of “Light Debris” in 10 southern parishes of coastal Louisiana, again stretching from the Mississippi border in the east (Pearl River) to Calcasieu Parish in the west. This “Light Debris” consisted of all the debris types described above, in 81 different waterways and included vessels, primarily recreational, which did not meet the definition of “Heavy Vessel” cited above. Finally, as a precursor to the award and execution of the final northern “Light Debris” contract, encompassing 11 parishes extending from the Mississippi border in the east (Pearl River) to the Texas border in the west (Sabine River), a resurvey of the eligible targets for that contract was conducted using in house USCG equipment and personnel. For this reporting period this unit was staffed by 15-19 USCG Reservists and one civilian. An additional 10 million dollars was allocated by FEMA for the conclusion of this mission. Two contracts for the removal of the remaining 7 heavy targets have been developed and await award and execution.<sup>6</sup>

These removal contracts remain to be awarded and executed. All have been developed and forwarded for solicitation. All USCG removal operations in support of the 2005 hurricanes will be completed within 120 days of the award of the largest of these three contracts, and its mission termination is scheduled, as cited above, for 2013.

#### *6.2.2.2 Removal Operations—Mississippi*

Removal operations in Mississippi were concluded in 2009. No further hurricane related Marine Debris removal operations were conducted in Mississippi during this reporting period.

#### *6.2.3 Interagency Work in the Papahānaumokuākea Marine National Monument*

The USCG continued its support of the marine debris removal partnership in the PMNM. As previously reported, in July 2009, the USCG teamed up with NOAA and the U.S. Army’s 7th Engineer Diving Team to remove more than 32 tons of derelict fishing nets and other refuse from the coral reefs in

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<sup>6</sup> These costs do not include any funds expended for “Marine Debris” removal conducted under ESF-10, nor do they include the USACE removals covered by an MOU with the USACE.

the PMNM. The USCG facilitated this cleanup by entering into a memorandum of understanding (MOU) with the U.S. Army's 7th Engineer Diving Team for the conduct of joint diving and marine debris removal operations in the PMNM.

#### *6.2.4 Interagency Work with the Army Corps of Engineers*

The USCG and USACE continue to work closely at the national and local levels coordinating the removal of marine debris. Coordination among the agencies is essential to ensure maritime mobility and safety is maintained throughout our nation's waterways. The USACE has the primary responsibility for removing wrecks and other obstructions from the navigable waters of the United States. While the USCG may assist with this effort, and may take the lead when oil or hazardous material is involved, its primary responsibility is to ensure the proper navigational marking of the wreck or obstruction. As a member of the National Dredge/Regional Dredge Team, the USCG is working with the USACE to consider development of a protocol for spill response/post-marine casualty dredging operations. The goal of the proposed protocol is to establish post-casualty dredging procedures in potentially contaminated areas, develop joint agency agreements, determine a range of contaminant sources and contents, and institute post-cleanup and long-term monitoring in order to study effects on the environment. The NDT plans to continue addressing this proposed protocol.

#### *6.2.5 Interagency Work with NOAA for Marine Debris Tracking*

On an informal basis, USCG District 17 (D-17) is providing assistance to NOAA by carrying ghost net tracking buoys aboard USCG vessels conducting High Seas Driftnet Enforcement patrols. The goal is to attach buoys to derelict nets encountered during patrols. The information collected from the buoys will allow researchers to both track the particular nets in order to facilitate future removal and improve debris transport models. Improved net tracking will assist in the removal of derelict nets before they threaten sensitive habitat or enter busy traffic lanes.

The USCG provides interagency assistance to NOAA on marine debris tracking and removal in conjunction with its statutory Law Enforcement and Aids to Navigation patrol missions, including coincident MD assist when feasible.

Some marine debris resulting from the Japan tsunami of March 2011 may be difficult to identify; however, the USCG continues to provide interagency assistance in surveilling for it, consistent with statutory missions. Marine debris can act as a fish aggregating device (FAD), and if a FAD of opportunity is located near or in the US EEZ, that can bring about a threat of illegal, unreported and unregulated fishing by a foreign fishing vessel, part of the USCG's statutory law enforcement mission on the monthly PMNM surveillance flight.

#### *6.2.6 Marine Debris Removals by Local Coast Guard Cutter Units*

Local USCG cutter units in the Great Lakes and in Northern New England reported removals of derelict fishing gear (DFG), a significant source of marine debris, as part of continued assistance at the local and state level and where DFG can be a significant safety of navigation, environmental, and fisheries industry concern. In one operation, the USCG Cutter *ABBIE BURGESS* retrieved 89 lobster traps in cooperation with the Maine Marine Patrol that were returned to owners after being entangled in with each other during a dedicated operational period in March 2011. This operation was undertaken in response to requests from commercial fishermen unable to retrieve gear and the Maine Lobsterman's Association. The effort was undertaken to remove vertical lines in the water that were irretrievable by individual lobster



vessels due to line snarls and eliminate irretrievable gear ghost fishing in this area.

### 6.3 *International Activities*

The IMO is a specialized agency of the United Nations which is responsible for measures to improve the safety and security of international shipping and to prevent marine pollution from ships. Its multinational 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, the USCG works to advance a number of key environmental interests at meetings of the IMO's Marine Environment Protection Committee. The USCG coordinated the U.S. interagency group responsible for the review of MARPOL Annex V and the drafting of amendments.

Two significant developments during this two-year period were the Wider Caribbean Region special area coming into effect for MARPOL Annex V on May 1, 2011, and MEPC's adoption of amendments to Annex V in July 2011. These amendments will enter into force January 1, 2013, and are discussed above in section 3.2 on multi-agency initiatives.

The USCG also actively participated in the development of the ISO standards for reception facilities and handling of ships' waste.

### 6.4 *Other MDRPRA Activities*

The USCG and NOAA jointly promulgated the definition of "marine debris," in fulfillment of the obligation under the MDRPRA. Marine debris is defined as follows: "for the purposes of the Marine Debris Research, Prevention, and Reduction Act (33 U.S.C. 1951–1958 (2006)) only, 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 the Great Lakes." In addition, the USCG sponsored a National Research Council report titled *Tackling Marine Debris in the 21st Century*.

### 6.5 *Outreach*

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.

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 educational outreach efforts, the Sea Partners Campaign continues its effort to reach out to the maritime industry beyond CY11. 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, outreach to marina owners and operators through the USCG Auxiliary, the USCG is committed to reaching a wide variety of audiences.

The USCG Auxiliary reports its vital operational hours for the Sea Partners Campaign in its reporting database, AUXDATA. In 2010 and 2011 combined, over 10,000 hours were committed toward the Sea Partners Campaign.

*Abandoned and derelict vessels are a type of marine debris that can damage sensitive marine debris habitats and marine life. If they lie within a navigational path, ADVs can also pose a threat to other vessels.*



## 7.0 FUNDING AND RECOMMENDATIONS

Section 5(c)(2)(E) of the MDRPRA requests an estimate of Federal funds spent on marine debris activities, as well as an estimate of non-Federal funding related to marine debris. The IMDCC has interpreted the requested non-Federal funding to be the required non-Federal match associated with the grants program outlined in Section 3(c)(2)(A) established under NOAA. Consistent with the timeframe of this report, the Federal agencies on the IMDCC provided the following information for fiscal years 2010 and 2011.

Please note that many Federal agencies conduct daily 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. Therefore, the exact amount of effort being expended to address marine debris could be higher or lower than the amounts reported here due to these integrated activities.

Section 5(c)(2)(E) also requests the IMDCC provide recommendations for priority funding needs. Each year, the IMDCC sets priority activities for the Committee based on emerging issues, research results, and the priorities of the Administration and individual agencies. In the 2008 Recommendations to Congress Report, the IMDCC set four theme areas in which to work: (1) marine debris prevention, (2) response to marine debris in the environment, (3) research and development, and (4) cross-theme issues. For fiscal years 2010 and 2011, the IMDCC continued to focus on these areas, although individual agency priorities focused on some subset of these themes depending on individual agency missions, authorities, and responsibilities. The primary purpose of the IMDCC is to serve a coordination role, ensuring as agencies move forward with their priorities and partnering where appropriate that available resources are used in the most cost-effective manner possible. Accordingly, the IMDCC works to ensure that:

- Effort and resources are not duplicated on the same projects;
- Resources are leveraged where possible;
- Project results and information are shared across agencies; and
- Effective and efficient activities are supported.

Table 2: FY2010 to FY2011 IMDCC Agency Funding

AGENCY	FY2010	FY2010 non- Federal Match	FY2011	FY2011 non- Federal Match	General Activity Description	Budget Line
DOC/ NOAA	\$3,996,000	\$1,053,831	\$3,990,008	\$1,176,737	Research, removal, outreach and education, coordination, prevention, database development, partnerships, grants, and contracts.	Marine Debris
DOD Navy	\$5,614,000		\$5,938,000		Navy: upgrades and maintenance of solid waste equipment on ships. USACE: Drift and debris removal. Air Force: relocation of Alaskan near-ocean landfills farther inland.	Debris Removal
USACE	\$14,611,000		\$15,217,000			
Air Force	\$1,400,000		\$6,508,000			
DHS/ USCG	\$202,241,000		\$202,224,000		See Section 6 for a comprehensive discussion of USCG activities.	Marine Environmental Protection
DOI FWS	\$1,800,000		\$1,800,000		FWS volunteer and staff programs: research, removal, outreach/ education, coordination, prevention, database development, partnerships.  Regulatory programs prevent and respond to marine debris at regulated facilities/operations on the OCS.	Wildlife and Habitat Management Midway Atoll Marine Debris Research and Cleanup Project
BSEE	\$50,000 + routine regulatory activities		Routine regulatory activities			
DOJ	Unable to provide a budget based on subject matter.					
DOS			\$123,750		Public Outreach and Project Development Campaign on Reducing Marine Litter in the Wider Caribbean.	
EPA	< \$100,000		< \$100,000		Prevention, monitoring, research, outreach and education, and removal.	Marine Pollution
MMC	\$12,500		\$0		5 <sup>th</sup> International Marine Debris Conference.	

\* In order to display budget allocation by Mission-Program, USCG uses an activity-based cost model that averages past expenditures to forecast future spending. 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.

## **APPENDICES**

- A. 2008 Recommendations
- B. Overview of the Interagency Marine Debris Coordinating Committee
- C. Federal Authorities by Agency
- D. USCG MARPOL Annex V Violation Cases

## Appendix A. 2008 Recommendations

The following recommendations are from the 2008 IMDCC Report to Congress (National Oceanic and Atmospheric Administration. 2008 Interagency Report on Marine Debris Sources, Impacts, Strategies & Recommendations. Silver Spring, MD. 62pp.).

### MARINE DEBRIS PREVENTION

#### 1. Education and Outreach

1.1: 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.

1.2: 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.

1.3: 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, 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 to provide recommendations regarding specific actions that can be taken to prevent or reduce marine debris.

#### 2. Legislation / Regulation / Policy

2.1: The 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.

2.2: 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.

2.3: The 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 the IMDCC's gap analysis of regulatory and non-regulatory authorities that can be used to promote marine debris prevention.

2.4: Federal agencies, coordinating through the 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.

#### 3. Incentive Programs

3.1: 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.

3.2: Federal agencies should work with State, local, Tribal, and nongovernmental entities to develop efficient recycling incentive programs for municipalities or appropriate venues.

3.3: 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.

## RESPONSE TO DEBRIS ALREADY IN THE ENVIRONMENT

### 4. Enforcement

4.1: 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.

4.2: 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.

### 5. Cleanups

5.1: 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.

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

5.3: Federal agencies should partner with State, local, Tribal, and nongovernmental entities to continue to support and conduct cleanup efforts.

## RESEARCH AND DEVELOPMENT

### 6. Research

6.1: Federal agencies, coordinating through the 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.

6.2: Federal agencies, cooperating through the IMDCC, should improve efforts to monitor marine debris, including shoreline, floating, and submerged debris, using lessons learned from previous federally funded monitoring efforts.

6.3: The 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) and the Joint Subcommittee on Ocean Science and Technology.

6.4: Federal agencies, coordinating through the 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.

## 7. Technology Development

7.1: Federal agencies should partner with State, local, Tribal, and nongovernmental 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.

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

## CROSS-THEME

## 8. Fostering Coordination

8.1: 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.

8.2: 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.

8.3: The 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.

8.4: Federal agencies should pursue partnerships, as appropriate, with nongovernmental entities to develop, promote, and implement strategies for preventing, reducing, or mitigating the impacts of marine debris.



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## Appendix B. Overview of the Interagency Marine Debris Coordinating Committee

Table B.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 the IMDCC. The IMDCC's outcomes are also included.

Table B.1. Overview of the Interagency Marine Debris Coordinating Committee

DRIVERS	ACTIVITIES	OUTPUTS	OUTCOMES
<p><b>Statutory and Regulatory</b></p> <p><b>Public Interest</b> (e.g., news stories on Pacific Trash Gyre)</p> <p><b>Concern for ecological, human health and safety, economic, and social impacts</b></p>	<p><b>Environmental Protection Agency</b> MPPRCA, MPRSA, SPA, CWA, RCRA, PPA Address land- and ocean-based sources through solid waste, stormwater, non-point source, and ocean regulations, voluntary programs, and outreach.</p> <p><b>Department of Commerce – National Oceanic and Atmospheric Administration</b> MDRPRRA, MPPRCA, MSRA, CZMA, ESA, MMPA, DAA, NIMSA, CRCA Address marine debris through mapping, identification, impact assessment, removal and prevention, focusing on living marine resources and navigation. Reduce and prevent loss of fishing gear. Public outreach and education.</p> <p><b>Department of Defense</b> <b>U.S. Army Corps of Engineers</b> RHA, FCA Obstructions in navigable waterways.</p> <p><b>Navy</b> Compliance with APPS for solid waste management and disposal of plastics from vessels. Preparation of vessels used as artificial reefs in accordance with Nat'l BMPs.</p> <p><b>Department of Homeland Security – USCG</b> MPPRCA, APPS, DAA, SPA, MDRPRRA Compliance and enforcement for ship-generated garbage.</p> <p><b>Department of the Interior</b> <b>Fish and Wildlife Service</b> ESA, MMPA, DAA, NWRSA and NWRSLA, AFCA Cleanup of shoreline/nearshore habitats. Impacts on fish/wildlife resources and habitats. Management of National Wildlife Refuge and National Monuments.</p> <p><b>Bureau of Safety and Environmental Enforcement</b> OCSLAA, OPA, EPACT Address marine debris from regulated facilities and operations through regulations, compliance, enforcement, voluntary programs, and partnerships with the offshore industry.</p> <p><b>Department of Justice</b> Judicial enforcement of environmental violation.</p> <p><b>Department of State</b> MARPOL Annex V and other relevant international agreements. Assistance to other countries on controlling land-based sources of pollution and derelict fishing gear.</p> <p><b>Marine Mammal Commission</b> MMPA Research and recommendations on impacts to marine mammals.</p>	<p><b>Environmental Protection Agency</b></p> <ul style="list-style-type: none"> <li>• Publications (BMPs, factsheets, reports) for municipal, industrial, and general audiences on solid waste, stormwater, and marine debris</li> <li>• Non-point source and marine debris prevention toolboxes</li> <li>• Research on marine debris found on beaches and in ocean</li> </ul> <p><b>Department of Commerce - National Oceanic and Atmospheric Administration</b></p> <ul style="list-style-type: none"> <li>• Federal Information Clearinghouse</li> <li>• Research and assessment of marine debris impacts to living marine resources</li> <li>• Topic-specific workshops for marine debris researchers and practitioners</li> <li>• Nets to Energy and Fishing for Energy partnerships</li> <li>• Over 150 grants and contracts since 2005</li> </ul> <p><b>Department of Defense</b></p> <ul style="list-style-type: none"> <li>• Report on obstructions removed from navigable waterways</li> </ul> <p><b>Navy</b></p> <p><b>Department of Homeland Security – USCG</b></p> <ul style="list-style-type: none"> <li>• Certification of adequacy for port and waterfront facilities</li> <li>• Inspections aboard vessels to ensure compliance with ship-generated garbage regulations</li> <li>• Detection and investigation of ship-generated garbage violations</li> <li>• Annex V revisions</li> </ul> <p><b>Department of Interior</b></p> <p><b>Fish and Wildlife Service</b></p> <ul style="list-style-type: none"> <li>• Reports on cleanups</li> <li>• ESA reports and mitigation action plans</li> <li>• Reports on refuge status and conditions</li> </ul> <p><b>Bureau of Safety and Environmental Enforcement</b></p> <ul style="list-style-type: none"> <li>• Issuance/enforcement of pollution prevention and control regulations through warnings, fines, and facility/component shut-ins</li> <li>• Site cleanup/removal or reefing of hurricane destroyed/end-of-life platforms</li> <li>• Industry structural design standards/recommended practices revisions, and incorporation of revisions into notices/regulations, to improve rig station keeping and ensure platform survivability during hurricanes</li> </ul> <p><b>Department of Justice</b></p> <ul style="list-style-type: none"> <li>• Fines and other penalties for marine debris/garbage violations</li> </ul> <p><b>Department of State</b></p> <ul style="list-style-type: none"> <li>• Annex V amendments and related guidelines</li> <li>• Assistance to other countries on controlling land-based sources of pollution</li> <li>• Conduct bilateral and multilateral cooperation and coordination with other countries on issues related to marine debris.</li> </ul> <p><b>Marine Mammal Commission</b></p> <ul style="list-style-type: none"> <li>• Related research and management publications</li> <li>• Recommendations to Federal agencies on protecting/conserving marine mammals</li> <li>• Distribution of information on biological impacts of marine debris</li> </ul>	<p>Increased understanding of sources, impacts, and mitigation effort related to marine debris</p> <p>Improved public awareness of the marine debris impacts and actions that can be taken to reduce marine debris pollution</p> <p>Decreased amount of material becoming marine debris</p> <p>Stronger protection of marine environment from pollution and marine debris</p> <p>Increased international coordination to manage marine debris</p> <p>Cleaner oceans, coasts, and waterways</p>

Table B.2. IMDCC Overview Acronyms

AFCA	Anadromous Fish Conservation Act
APPS	Act to Prevention Pollution from Ships
CRCR	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
MPSRA	Marine Protection, Research, and Sanctuaries Act of 1972
MSRA	Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006
NMSA	National Marine Sanctuaries 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

## Appendix C. Federal Authorities by Agency

Table C.1. 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.

Authority	Explicitly mentions marine debris	Addressess sources and items that may become marine debris	Addressess entities that may be impacted by marine debris	Regulatory
Marine Debris Research, Prevention, and Reduction 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. 1456(b)	NOAA			
Marine Plastic Pollution Research and Control Act 33 U.S.C. 1914-1915	EPA, NOAA	EPA, NOAA, USCG		
Driftnet Act Amendments of 1990, 16 U.S.C. 1826		NOAA, FWS, DOS		X
Marine Protection, Research and Sanctuaries Act, 33 U.S.C. 1401–1445 (Ocean Dumping Act) Title I & II		EPA		X
Shore Protection Act, 33 U.S.C. 2603		EPA, USCG		X
Clean Water Act, 33 U.S.C. 1346(f), 1342, 1329		EPA		X
Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. 1801 et seq.		NOAA		X

Table C.1. Federal Authorities by Agency continued.

Authority	Explicitly mentions marine debris	Addresses sources and items that may become marine debris	Addresses entities that may be impacted by marine debris	Regulatory
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		
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
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. P.L. 94-587, Sec. 202		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		X
Energy Policy Act of 2005, 42 U.S.C. 15801 et seq.		BSEE		X

Table C.1. Federal Authorities by Agency continued.

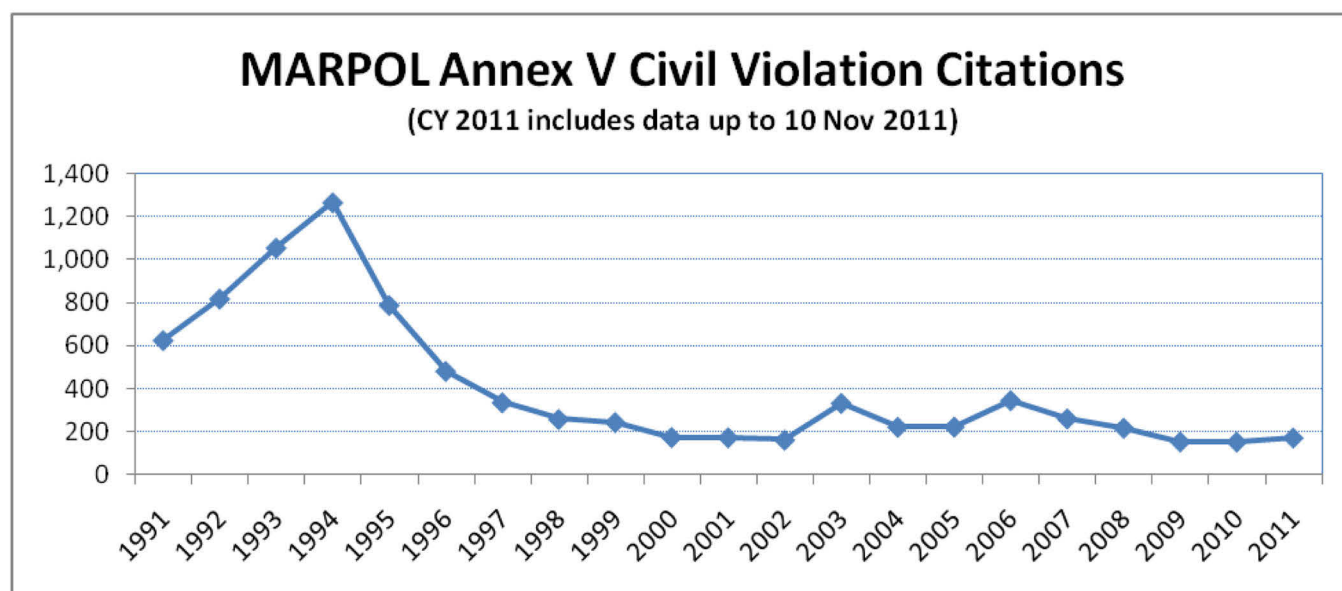
Authority	Explicitly mentions marine debris	Addresses sources and items that may become marine debris	Addresses entities that may be impacted by marine debris	Regulatory
National Marine Sanctuaries Act, 16 U.S.C. 1431 et seq.		NOAA	NOAA	X
National Wildlife Refuge System Administration Act of 1966 & National Wildlife Refuge System Improvement Act of 1997, 16 U.S.C. 668dd			FWS	
Anadromous Fish Conservation Act, 16 U.S.C. 757a et seq.			FWS	
Endangered Species Act of 1973, 16 U.S.C. 1531 et seq.			NOAA, FWS	X
Marine Mammal Protection Act, 16 U.S.C. 1402			NOAA, MMC, FWS	X

## Appendix D. USCG MARPOL Annex V Violation Cases

Table D.1. USCG MARPOL Annex V Violation Cases.

Cite	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
33CFR151.15 - Reporting Requirements	0	8	6	8	6	4	3	1	0	3	2	1	3	3	5	8	9	4	5	10	9	98
33CFR151.53 - Special Areas	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
33CFR151.55 - Record Keeping	3	2	1	49	17	2	5	4	1	0	1	0	0	0	2	1	1	1	1	1	1	93
33CFR151.57 - Waste Management Plans	269	322	396	407	220	160	99	72	64	51	67	55	90	83	65	112	65	56	43	23	26	2,745
33CFR151.59 - Placards	302	318	410	632	440	245	198	162	156	98	96	100	233	130	146	219	178	150	104	114	131	4,562
33CFR151.63 - Shipboard control of garbage	16	27	35	35	28	4	4	6	2	1	2	3	1	0	0	1	0	0	0	0	0	165
33CFR151.63(a) - Person in Charge	0	0	0	0	0	0	0	0	0	0	0	2	3	1	4	1	0	2	0	0	1	14
33CFR151.65 - Reporting Requirements	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
33CFR151.66 - Operating Requirements in navigable waters (garbage)	11	18	28	16	19	7	3	1	4	10	2	0	0	0	1	2	5	4	0	3	2	136
33CFR151.67 - Operating Requirements (plastics)	25	115	173	118	58	60	24	10	18	11	3	2	4	5	1	1	3	1	2	3	2	639
33CFR151.69 - Operating Requirements outside special areas (garbage)	0	8	6	1	1	1	1	2	0	1	0	0	0	0	0	2	0	0	0	0	0	23
33CFR151.71 - Operating Requirements within special areas (garbage)	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	1	0	0	1	5
33CFR151.73 - Operating Requirements from fixed or floating platforms (garbage)	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
33CFR151.75 - Grinders or comminuters	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
<b>Total</b>	<b>626</b>	<b>819</b>	<b>1,056</b>	<b>1,267</b>	<b>790</b>	<b>483</b>	<b>337</b>	<b>259</b>	<b>245</b>	<b>175</b>	<b>174</b>	<b>163</b>	<b>334</b>	<b>223</b>	<b>224</b>	<b>347</b>	<b>262</b>	<b>219</b>	<b>155</b>	<b>154</b>	<b>173</b>	<b>8,485</b>

Table D.2. USCG MARPOL Annex V Violation Citations





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