2013 ACCOMPLISHMENTS REPORT
NOAA MARINE DEBRIS PROGRAM

RESEARCH PREVENT REDUCE REMOVE EDUCATE

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NOAA Marine Debris Program
Office of Response and Restoration
National Ocean Service
National Oceanic and Atmospheric Administration
U.S. Department of Commerce

DECAYED ALBATROSS

Bottle caps, consumer debris, and other microplastics comprise the gut contents of this decesaed albatross found in the Northwestern Hawaiian Islands.

OVERVIEW: NOAA MARINE DEBRIS PROGRAM

ABOUT THE PROGRAM

Marine debris is everyone's problem. It affects everything from the environment to the economy; from fishing and navigation to human health and safety; from the tiniest coral polyps to giant blue whales.

The NOAA Marine Debris Program (MDP) leads national and international efforts to research, prevent, and reduce the impacts of marine debris. Its staff, which is positioned across the country, supports marine debris projects in partnership with state and local agencies, tribes, non-governmental organizations, academia, and industry. The program also spearheads national research efforts and works to change behavior in the public through outreach and education initiatives.

MARINE DEBRIS ACT: REAUTHORIZATION

In December 2012, Congress passed legislation reauthorizing the NOAA MDP. The new, amended Marine Debris Act largely preserved the program's mandates to research, prevent, reduce, and remove marine debris, but it added a new core function: addressing severe marine debris events. The bill recognizes the need to address the unusual amounts and types of marine debris following events such as tsunamis or hurricanes and NOAA's critical role, placing the program at the forefront of coordination and scientific support for these events.

NOAA divers and staff work together to pull out derelict nets from Hawaiian waters around Midway Atoll.

MIDWAY ATOLL, HAWAI'I

LEADING IN MARINE DEBRIS:
FROM THE DIRECTOR

Last December, Senator Daniel Inouye of Hawai'i, a long time marine debris champion and driving force behind this program's existence, passed away. In a speech before us in March 2011, he touted the Hawaiian tradition of "mālama," meaning "to care for" the ocean and the land, and he emphasized the importance of working together to solve the marine debris problem. Collaboration has always been the way of the NOAA Marine Debris Program, and that is how we spent our 2013, working through that legacy he left us.

Many of our achievements this year have either been a direct result of work with our dedicated partners or through efforts to improve collaboration. In June, we launched the Marine Debris Clearinghouse, a unique online database that will be an information hub for the nation's marine debris stakeholders. Through it, we can hopefully inspire action.

Another major milestone came late in December , when Congress passed a bill reauthorizing our program. In addition to reaffirming our mandate to address debris, the reauthorization also increased our scope of work with a new core function to address "severe marine debris events," caused by natural disasters.

These somber efforts to address natural disaster debris continued throughout the year. We mobilized when Sandy swept through the Northeast, devastating entire communities and leaving debris in its wake. The program's response to Japan tsunami marine debris also continued, and while the amount of debris washing ashore was less than previous years, we were not short on activity. In the regions where we focused these efforts, we saw amazing work from our partners, and the outcome is an emerging marine debris response community.

Marine debris removal projects, research on plastics and detection, and education and outreach also continued – all through robust partnerships. I am very proud to present the NOAA Marine Debris Program's accomplishments from 2013, and I look forward to seeing what we can accomplish in the new year, together.

Finding marine debris solutions through research, outreach, and education, both nationally and regionally, is an every day task for the NOAA MDP. The program made great strides towards reducing, preventing, and raising awareness about the global debris issue in FY13. Here's a look at a few highlights and some major accomplishments from this past year.

REGIONAL HIGHLIGHTS

NORTHEAST

Ghost fishing occurs when lost or abandoned fishing gear continues to catch animals.

Lost pots have the potential to ghostfish for crabs, lobster, and other ecologically important species such as turtles, causing an economic loss to the fishery and habitat destruction.

LONG ISLAND SOUND DERELICT LOBSTER GEAR ASSESSMENT REMOVAL AND PREVENTION

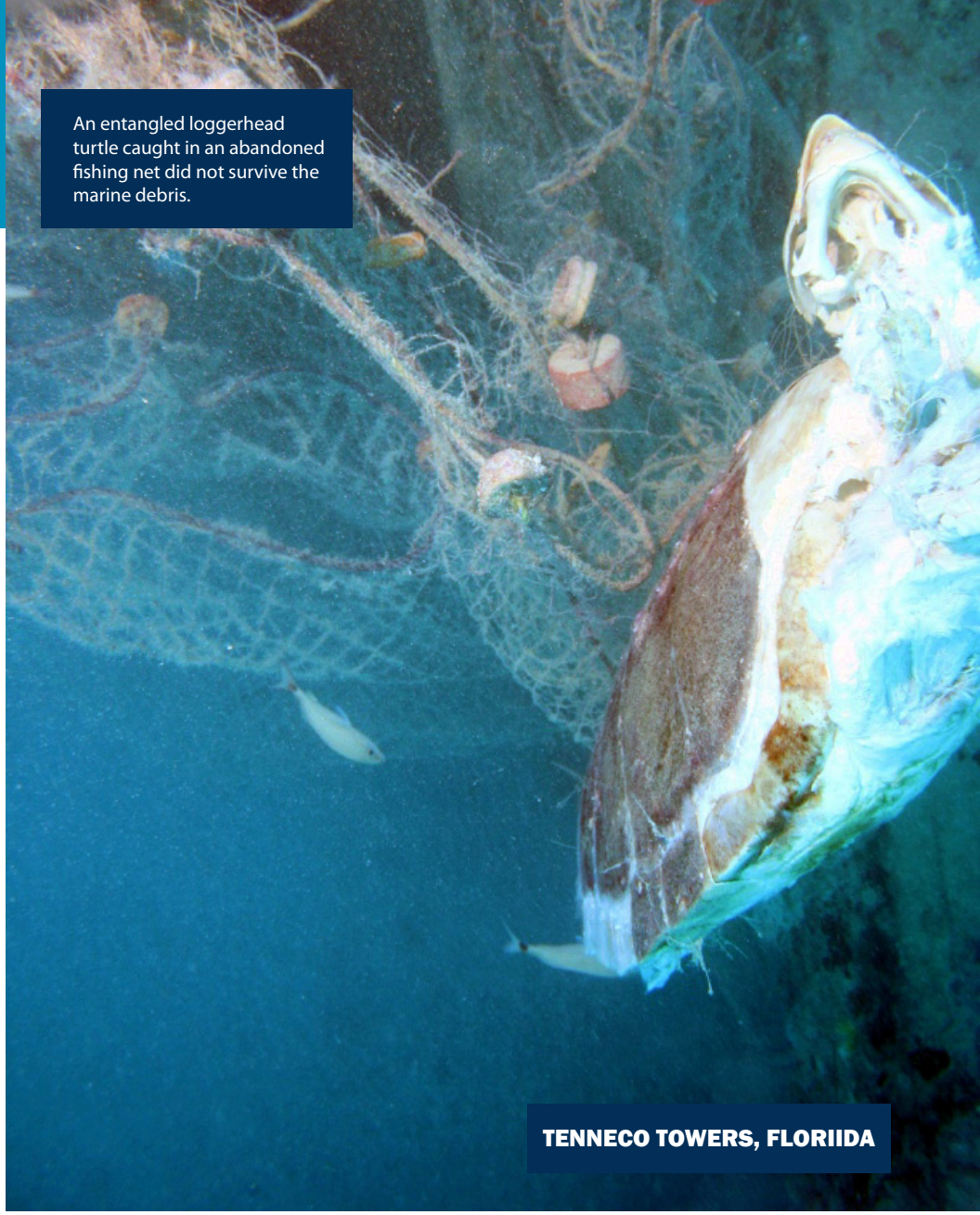
In 2013, the NOAA MDP funded the Cornell Cooperative Extension of Suffolk County (CCE) through the NOAA Community-based Marine Debris Prevention and Removal Grants Program to remove abandoned lobster traps and other fishing gear from the Long Island Sound. Derelict fishing gear can spend years on the seabed, **"ghostfishing"** and damaging habitat as it settles. The gear can also compromise navigational safety and damage fishing equipment and boats.

Members of the Long Island Lobstermen's Association and CCE staff identified, located, and safely removed lost gear from the seabed. Fishers recycled the retrieved gear at Covanta, a local recycling facility that turns old fishing gear into a renewable energy source through the Fishing for Energy partnership (see page 22 – Fishing for Energy).

DERELICT CRAB TRAP REMOVAL IN THE MULLICA RIVER GREAT BAY ESTUARY

The Mullica River–Great Bay estuary, one of the most pristine East Coast estuaries, drains approximately 353 square miles of New Jersey's pinelands and is an important resource for the region's commercial crabbers. Unfortunately, boat traffic and powerful storms cause crabbers to lose many of their pots every year. In 2013, NOAA MDP funded a two-year project through Richard Stockton College of New Jersey to conduct on-the-ground, sustainable, community-based derelict fishing gear removal efforts in the region. Project leads used sonar to locate more than 1,500 crab pots in a 5-square-mile area and recovered 491 pots. Stockton College will continue its removal efforts, improving recovery techniques and educating the local boating community on the impacts of derelict fishing gear.

SOUTHEAST AND CARIBBEAN



An entangled loggerhead turtle caught in an abandoned fishing net did not survive the marine debris.

TENNECO TOWERS, FLORIIDA

DERELICT NET REMOVAL IN SOUTH FLORIDA

In the early spring of 2013, the NOAA MDP learned that an abandoned commercial fishing net was tangled around **Tenneco Towers**, an artificial reef in South Florida waters. The large monofilament net, with floats on top and lead weights at the bottom, posed a serious threat to divers and marine life that encounter the popular reef, located two miles offshore in Florida waters near the Miami-Dade and Broward county line.

The net had entangled fish and a loggerhead turtle. Local divers and resource managers were concerned that more marine life would be trapped if it was left underwater. The NOAA MDP worked with federal, state and local agencies to raise removal funds and assess the net's condition, develop safe removal plans, and coordinate its removal. That enduring partnership included the Florida Department of Environmental Protection, Covanta Energy, Miami-Dade County Environmental Resources Management, the National Fish and Wildlife Foundation, the National Save the Sea Turtle Foundation, the U.S. Coast Guard, the U.S. Navy and the Wildlife Foundation of Florida.

Tenneco Towers artificial reef was made from an old Louisiana oil rig and placed offshore to attract fish and serve as a substrate for coral and other marine life.

BROWARD COUNTY WASTE TIRE REMOVAL PROJECT

During the 1970s, 700,000 tires were placed on Osborne Reef, located 1.3 miles off the coast of Fort Lauderdale, FL, in an effort to create additional fish habitat. Over the years, tropical storms and hurricanes mobilized the tires, damaging nearby existing coral reefs and shorelines. In 2013, the NOAA MDP, along with local agencies, funded Broward to put contract removal efforts. With continued funding into 2014, the county will contract SCUBA divers will work to locate, remove, and dispose of tires found at Osborne Reef.

Workshop participants view the Port of Cleveland's cleanup vessels.

PORT OF CLEVELAND, OHIO

GREAT LAKES

GREAT LAKES LAND-BASED DEBRIS ACTION PLANNING

In May 2013, the NOAA MDP, in partnership with the Alliance for the Great Lakes and Old Woman Creek National Estuarine Research Reserve, brought together a diverse group of stakeholders to develop a strategic plan for addressing land-based marine debris – the first of its kind for the Great Lakes region.

Representatives from federal, state and local agencies, as well as non-governmental organizations participated and identified five major goals: Addressing science, policy, outreach and education, impact reduction through removal, prevention, and strategic partnerships. The group also identified specific actions under each goal and will finalize them in the new fiscal year.

OHIO CLEAN MARINAS PROGRAM

The Ohio Clean Marinas Program increases environmental stewardship by educating boaters and marinas on environmental laws and helping them follow best management practices. This year, the NOAA MDP worked with Ohio Clean Marinas to increase education on marine debris by providing prevention messaging, incorporating marine debris language into best management practices and boater tip sheets, and distributing signage. The NOAA MDP also helped Ohio Clean Marinas leverage a partnership with the BoatUS Foundation to place more than 20 monofilament fishing line recycling bins at participating "Clean Marinas" sites.

GULF OF MEXICO

REMOVAL ON FLORIDA'S FORGOTTEN COAST

Florida's "Forgotten Coast," a stretch of sandy, remote beaches east of Panama City provides ideal nesting sites for endangered sea turtles and shorebirds, thanks to its sparse human population. Unfortunately, storms have caused marine debris to accumulate in the area, threatening the nesting species. In 2013, with support from the NOAA MDP, the University of Florida led cleanups, preceding sea turtle nesting season, to restore the habitat. The group mapped, measured, and removed 3,500 pieces of debris, including small items such as plastic bottle caps and cigarette butts to large items such as propane tanks – all totaling about 45 tons. In the first phase, 175 volunteers cleaned 75 km of beach on five different beaches.

With continued funding into 2014, the University of Florida will craft outreach and education materials for the Northwest Florida community, continue cleanups, and analyze data to determine potential debris impacts on this sensitive habitat.

HORN ISLAND BARGE REMOVAL

Until recently, a large, dilapidated barge jutted out of the water near Horn Island, a thin barrier island off the coast of Mississippi. The partially submerged barge created a hazard to navigation and adversely altered seagrass habitat, replacing **seagrass** beds with bare sand substrate and preventing re-colonization of seagrass from nearby patches . The rusting, metallic barge remains potentially disrupted the habitats of an array of wildlife, including alligators, herons, pelicans, ospreys, and other migratory birds.

To promote ecological restoration, the Gulf Islands National Seashore, with support from the NOAA MDP, spearheaded a large collaborative effort to assess and remove the sunken barge. Removal operations began in August 2013, and a team from Gulf Stream Marine Enterprises, Inc., contracted by the National Park Service, worked tirelessly to remove the barge. The team removed the majority of the structure within the first few days of labor, and further operations to assess the underwater portions of the site are underway. Now that the barge is gone, seagrass beds will hopefully return to the area.

Seagrass beds are essential habitat for species of conservation concern (e.g. sea turtles) including fishes, shrimp, and crabs. Seagrass improves water quality, dampens waves, and stabilizes sediment.

A piece of an abandoned barge, along the north side of Horn Island, pokes above the water's surface, posing a threat to navigation safety and impacting the seagrass beds on the seafloor.

HORN ISLAND, MISSISSIPPI

A large, weathered piece of wood debris along the Alaskan shoreline.

TENEKEE SPRINGS, ALASKA

ALASKA

The NOAA community-based removal grant is a funding opportunity offered by the NOAA MDP in cooperation with the NOAA Restoration Center.

TENAKEE SPRINGS GOES ALL-IN ON DEBRIS REMOVAL

Marine debris removal efforts across Alaska continued in 2013, with two groups funded to remove debris during the short Alaskan field season through the **NOAA Community-based Marine Debris Prevention and Removal Grants Program**. In Tenakee Springs, a town of less than a 100 in Southeast Alaska, residents used their own boats and a lot of ingenuity to clean over 35 miles of shoreline, removing nearly 3.5 tons of debris. On the other side of the Gulf of Alaska, Island Trails Network put together a team of volunteers to clean the remote beaches of Tugidak Island, an uninhabited island southwest of Kodiak Island known for its important seabird nesting habitat. Working out of a camp in shifts, 13 volunteers removed an estimated 25,000 pounds of debris from 4.5 miles of shoreline.

PRIORITIZATION

Following the arrival of tsunami debris from Japan in 2012, the NOAA MDP worked with the state to use debris density data and impact assessments to help the state rank beaches and allocate resources for future cleanups. The prioritization will remain a resource for future cleanup planning in the marine debris community.

GYRE EXPEDITION

The NOAA MDP participated in the GYRE project, an innovative effort led by the Alaska SeaLife Center that took scientists, artists, and debris cleanup experts on a seven-day expedition to experience and discuss the marine debris problem on Alaskan shores. The crew stopped at remote beaches and met with the partners that clean and care for them, capturing scientific data and artistic impressions along the way. Findings from this expedition will be part of a 2014 marine debris exhibit at the Anchorage Museum, supported in part by the NOAA MDP.

Volunteers remove debris previously collected by National Park Service staff from Hallo Bay in Katmai National Park. The debris was transported to Seward for disposal, as there was nowhere to take it locally.

HALLO BAY, ALASKA

A Vessel Assist crew removes a derelict vessel from the sea floor in the waters surrounding the A-8 Anchorage site in San Diego Bay.

SAN DIEGO, CALIFORNIA

WEST COAST

SAN DIEGO BAY ANCHORAGE VESSEL REMOVAL

An anchorage is an area of a harbor where vessels can be anchored.

Until 2008, A-8 Anchorage, a once free, long-term **anchorage** site in San Diego Bay, provided a home for houseboats and a place for boaters to park vessels for long periods of time. However, a significant marine debris issue – derelict vessels, including sunken vessels abandoned at the site – prompted the San Diego Board of Port Commissioners to shut it down. Shortly after, the NOAA MDP funded a three-phase marine debris removal project, proposed by the San Diego Unified Port District.

In Phases 1 and 2, project leads at the port used side-scan sonar to assess the site and recruited volunteers to remove 75 vessels and 700 pieces of debris, totaling more than 175 tons. Side-scan sonar images from the first two phases revealed additional debris in the surrounding area. Phase 3, conducted this year, continued the use of side-scan sonar in targeting debris concentration areas. Volunteers removed 11 vessels and nearly 1,000 pieces of debris from the 350 acre area surrounding the A-8 Anchorage. In total, these efforts resulted in the removal of more than 350 tons of debris from San Diego Bay.

DEBRIS REMOVAL AT POINT MOLATE BEACH

With support from the NOAA MDP, San Francisco Baykeeper removed roughly 100 tons of marine debris from Point Molate beach in Richmond, CA. The debris was mostly **creosote** -treated wood pilings, which accumulated at the site over the course of several decades. Old piers and other maritime facilities in the area have broken down over time and become the source of this debris.

Volunteers spent 470 hours removing the pilings and other debris. It helped restore and enhance the coastal habitat and facilitated the September 2013 re-opening of the park, which had been closed for nearly 12 years.

Creosote is a widely used wood preservative in the United States.

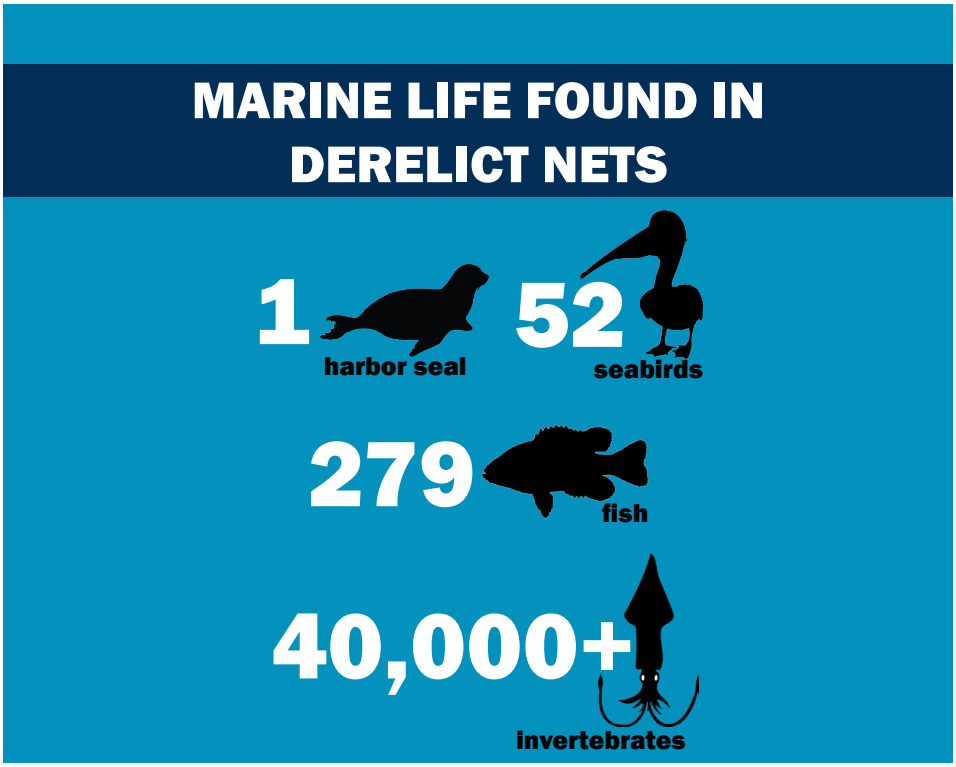
Wood treated with creosote is used commercially in railroad construction, utility poles, docks, seawalls, and pier pilings.

WEST COAST GOVERNOR'S ALLIANCE MARINE DEBRIS STRATEGY

Since 2008, the NOAA MDP has supported the West Coast Governor's Alliance (WCGA), working closely with the WCGA Marine Debris Action Coordination Team, to draft a strategy that provides a framework to identify, assess, prevent, and reduce marine debris. The program funded two of the three workshops needed to bring the team together to outline and draft the strategy, and in June, the WCGA Executive Committee approved it. The strategy will serve as a baseline to achieve debris reduction targets through removal and prevention efforts.

NORTHWEST STRAITS FOUNDATION DERELICT NET REMOVAL

The Northwest Straits Initiative has removed derelict fishing nets from the Puget Sound for more than a decade. The nets, mostly monofilament gillnets lost during the height of salmon fishing in the sound, continue to indiscriminately entangle marine life and impact sea floor habitat. In 2013, the NOAA MDP funded a net removal project, coordinated by the Northwest Straits Foundation and the Natural Resources Consultants. Over 100 days, divers removed 224 nets and 24 crab pots and restored 41 acres of habitat.



A NOAA diver removes a pile of derelict fishing gear from the reefs in Midway Atoll, one of several atolls and islands of the Papahānaumokuākea Marine National Monument and World Heritage Site.

MIDWAY ATOLL, HAWAI'I

PACIFIC ISLANDS

MIDWAY ATOLL MARINE DEBRIS SURVEY AND REMOVAL EFFORT

As part of an ongoing effort since 1996, trained NOAA divers with the NOAA Pacific Islands Fisheries Science Center's Coral Reef Ecosystem Division remove derelict nets and gear each year from the coral reefs and coastlines in the Northwestern Hawaiian Islands. In 2013, the effort, funded in part by the NOAA MDP, focused on Midway Atoll. In total, divers removed more than 13 metric tons of gear and plastics from the shoreline and nearshore reefs. The crew also collected shoreline debris data at three sites for a pilot accumulation rate study on derelict fishing gear as part of the NOAA MDP's Marine Debris Monitoring and Assessment Project.

DEBRIS REMOVAL IN HAWAI'I

In August 2013, 35 volunteers removed 491 pounds of nets and ropes and an additional 435 pounds of plastic floats, tires, and fish trap parts, bottles, and general debris at the first Surfrider Kauai Beach Cleanup and Net Patrol marine debris cleanup at Hanamaulu Beach. Surfrider was one of six organizations that received funding from the NOAA MDP and Hawai'i Department of Land and Natural Resources to conduct cleanups. The nets and ropes were adopted by Restore Kauai for reuse or shipped to H-Power, courtesy of Matson and Schnitzer Steel.

Microplastic collected from the ocean column. These small bits of plastics make up the majority of items found in the "Great Pacific Garbage Patch" where they float suspended in the water column.

MICROPLASTICS

RESEARCH

MARINE DEBRIS CLEARINGHOUSE

In June 2013, the NOAA MDP launched the Marine Debris Clearinghouse, an online database that will serve as the federal government's information hub for marine debris stakeholders. This resource benefits the nation's coastal managers, researchers, and communities as they work to study and mitigate marine debris and its impacts.

The site, developed in partnership with NOAA's National Coastal Data Development Center, provides users access to information on ongoing and historical marine debris projects related to removal, research, and outreach. The site's sophisticated search function allows users to query specific project data, such as date and description, location, or marine debris type.

Looking ahead, the Clearinghouse will include new features, including a resource library that will provide access to regional action and response plans, technical documents, and "state-of-the-science" papers that discuss key findings and knowledge gaps in marine debris research and operations.

PLASTICS

In 2013, the NOAA MDP funded research through the University of Maryland to analyze samples the program collected during surface trawls in the Chesapeake Bay. The researchers found **microplastics** in almost all of the samples, proving that an analytical quantification technique developed by the University of Washington Tacoma and the NOAA MDP works, and further confirming that microplastics are a problem in coastal systems. To further study the impacts of plastic on the marine environment, the program also funded research this year that will investigate the chemical effects of marine debris.

Understanding the impacts of plastics, especially microplastics, on the marine environment is crucial to seeking solutions to reduce and prevent plastic debris.

This year, the NOAA MDP also supported the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP), an advisory body to the United Nations, to conduct a global assessment of microplastic particles. GESAMP brought together members from nine countries and five continents, including the NOAA MDP, to form a working group. In July, members of the working group met to draft an assessment report that covered the inputs of plastic and microplastic to marine systems, particle degradation and transport, the effects of microplastic on marine organisms, and public perception.

An unmanned aircraft system flies over the Olympic Coast taking high-definition images of seabirds and shoreline debris.

OLYMPIC COAST, WASHINGTON

UNMANNED AIRCRAFT SYSTEM

One of the primary challenges of research on at-sea debris is detecting and quantifying widely dispersed open ocean debris. Once the debris comes ashore, it can become concentrated on "catcher" beaches that are inaccessible or inhabited by protected species, posing further challenges in access and detection.

The NOAA MDP cooperated with the NOAA UAS Program, NOAA National Environmental Satellite, Data, and Information Service, and the University of Alaska at Fairbanks on a project to evaluate the potential for use of small UAS in detecting debris, including surveys both at-sea and on shore. As part of this project, NOAA conducted field testing of a UAS on the Olympic Coast of Washington in June 2013. The mission had three elements; a primary seabird survey, shoreline debris detection, and targeted offshore debris survey. Post-processing of the data is ongoing, but initial results showed low debris densities offshore and pockets of higher debris density at "catcher" beaches onshore. These onshore results will be "groundtruthed" using field observations from shoreline survey teams, allowing for a clear analysis of the UAS' effectiveness.

Siuslaw Surfrider volunteers measure a beach transect along the shoreline as part of the Marine Debris Monitoring and Assessment Project.

FLORENCE, OREGON

MARINE DEBRIS MONITORING AND ASSESSMENT PROJECT (MD-MAP)

Over the last year, the NOAA MDP has increased the number of partner organizations monitoring and assessing shoreline sites as part of the MD-MAP, focusing efforts on regions impacted by Japan tsunami marine debris. The MD-MAP surpassed 150 monitoring sites in Alaska, British Columbia, Washington, Oregon, California, and Hawaii, and the program is expanding to other states, starting with Virginia.

Through the project, the NOAA MDP collects baseline data that will help identify targets for mitigation, evaluate the effectiveness of marine debris prevention efforts, and determine marine debris impacts on the marine environment. Survey data and photos are placed in an online database, developed this year, to facilitate data analysis and regional comparisons of debris types, abundances, and trends.

DERELICT CRAB TRAP RESEARCH

In order to better understand the derelict fishing gear problem, the NOAA MDP has supported multiple research efforts to measure and address the impacts of **derelict crab traps** in Alaska's Dungeness crab fisheries. In 2013, a NOAA MDP funded project at NOAA's Auke Bay Labs to test escape mechanisms on Dungeness crab traps via lab experiments concluded. Investigators used results from a previous study showing metal fatigue as a main factor interfering with proper trap opening and developed a project to mitigate it. The NOAA MDP and partners will now move forward with testing biodegradable panels in the field. This research could lessen the impact of a Dungeness crab trap once it becomes derelict.

Traps may stay in the environment for six or more years before breaking down due to the cold water temperatures.

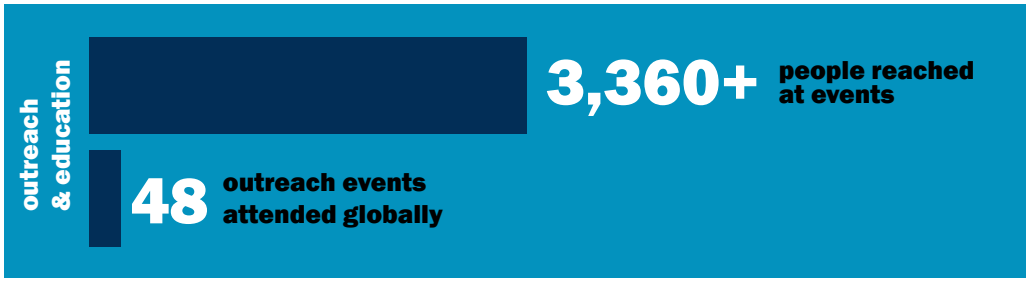
Volunteers collect fishing nets and consumer debris along the shoreline in the Gulf of Mexico region.

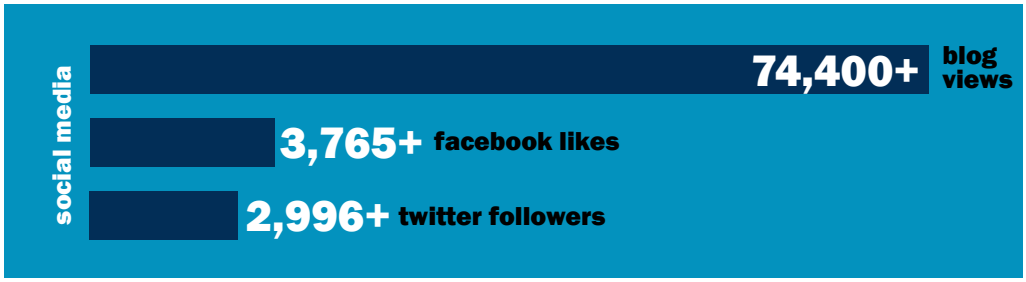
FAIRHOPE, ALABAMA

OUTREACH & EDUCATION

PREVENTING DEBRIS THROUGH OUTREACH & EDUCATION

The NOAA MDP strives to change behavior every day to reduce and prevent marine debris through outreach and education. In the past year, the NOAA MDP participated in events nationwide to spread the word about the impacts of marine debris and how local communities and individuals can help be part of the solution. In 2014, the NOAA MDP looks forward to expand outreach and education and initiative through new partnerships and initiatives.





Artwork by 2013 "Keep the Sea Free of Debris!" art contest finalist, Lindsey B., Grade 6, from North Carolina.

2013 "KEEP THE SEA FREE OF DEBRIS!" ART CONTEST

Artwork from the annual "Keep the Sea Free of Debris!" art contest serves as an outreach and educational tool. Each year students in K-8 grades submit artwork showing the impact of marine debris on the ocean environment. In 2013, the NOAA MDP received more than 600 art entries from 21 states across the U.S. 13 winners will be featured in the 2014 Marine Debris Calendar.

DIGITAL OUTREAH PARTNERSHIP

As part of a digital outreach partnership, the NOAA MDP supported Ocean Conservancy, a national non-profit group advocating for healthy oceans, to reach beyond the one-day-a-year cleanup and started a year-round movement, developing a Do-It-Yourself Cleanup Kit, a new mobile application, **Rippl**, and on-going campaigns encouraging prevention. Keep the Coast Clear, a website developed early on in the partnership, allows Ocean Conservancy to direct visitors to clear actions to prevent marine debris. As part of this site, Ocean Conservancy launched the award-winning Trash-Free Challenge, a movement designed to reduce the amount of trash we all create.

Rippl is a free mobile application that delivers weekly living green tips to nearly 12,000 active users who want to improve their daily habits to improve our ocean and waterways.

SEVERE MARINE DEBRIS EVENTS

JAPAN TSUNAMI MARINE DEBRIS

The NOAA MDP's response to marine debris from the 2011 Japan earthquake and tsunami arriving on U.S. shores stretched into the 2013 fiscal year. As work continued in the states on regional response plans and cleanup, winter ushered in two major events that spurred activity for the program: a $5 million gift from Japan and a second dock landing on U.S. coasts.

FUNDING TO STATES

In December 2012, the Government of Japan gifted $5 million to the United States, through the NOAA MDP, to support debris cleanup and response activities. The NOAA MDP distributed funds to states through formal agreements, providing an initial $250,000 each to Alaska, Washington, Oregon, California, and Hawai'i.

OLYMPIC COAST DOCK REMOVAL

The significant amount of planning federal, state, and local agencies conducted in Washington paid off, when a 70-foot concrete and Styrofoam dock from Japan was spotted off the coast in December 2012. Federal and state agencies and Indian Tribes responded to the dock sighting quickly and collaboratively. NOAA coordinated the response with the state and other federal agencies, while providing trajectories to estimate the dock's movement and possible landfall.

After the dock washed up on a rugged Olympic Coast shoreline, the NOAA MDP and partners in the National Park Service, Olympic Coast National Marine Sanctuary, and state agencies quickly set out to assess it and put a removal plan in motion. With critical and generous financial support from the Government of Japan, National Park Service, and NOAA, Olympic Coast National Marine Sanctuary contracted with the Undersea Company from Port Townsend, which cut the dock in place and removed all pieces by helicopter, completing the removal safely by March 2013. The dock's timely removal eliminated a substantial safety and environmental risk, restoring a remote and protected area to its natural state.

SANDY MARINE DEBRIS RESPONSE

During the 2012 hurricane season, Sandy inflicted severe damage to communities and coastal resources over large areas of the Mid-Atlantic and Northeast states, depositing huge amounts of debris in coastal waters and along shorelines. This debris poses hazards to navigation, commercial fishing grounds, and sensitive ecosystems.

After the initial emergency response, the NOAA MDP pulled together state and local agencies in impacted states to determine needs, coordinate debris response activities, and begin initial assessments. The program worked with partners to develop a model showing areas where debris had most likely accumulated and analyzed sonar and LiDAR survey data to find submerged debris.

In the Disaster Relief Appropriations Act of 2013, Congress provided the program with $4.75 million to locate and potentially remove the marine debris Sandy generated. The program will continue activities in FY14 with a combination of aerial, underwater, and shoreline surveys necessary to assess the quantity and location of marine debris in the impacted coastal areas. These assessments will allow NOAA to estimate the debris' impacts to economies and ecosystems, identify priority items for removal, develop best removal practices, and support limited removal efforts.

Aerial view of debris left by Sandy at Edwin B. Forsythe National Wildlife Refuge.

GALLOWAY, NEW JERSEY

A worker uses a 30% bleach spray to decontaminate and reduce the spread of possible marine invasive species on the Japanese dock which made landfall on Washington's Olympic Peninsula.

CLALLAM, WASHINGTON

PARTNERSHIPS

FISHING FOR ENERGY

Fishing for Energy is an innovative public-private partnership between the NOAA MDP, the National Fish and Wildlife Foundation, Schnitzer Steel and Covanta Energy designed to provide commercial fisherman a cost-free way to recycle old and unusable fishing gear. Schnitzer Steel collects gear and recycles any metal, and transports the remaining gear to Covanta facilities, where it is converted into energy. Since launching in 2008, Fishing for Energy has processed more than 2.2 million pounds of old fishing gear from 44 ports across the nation, a portion of which has been retrieved directly from the ocean by fishers. This year, the partnership added Martha's Vineyard, MA and Miami – Port Everglades, FL to its port list.

In August 2013, partners in the Fishing for Energy initiative gathered at Covanta Energy-from-Waste facility in Haverhill, MA to celebrate a significant milestone: the facility has turned more than 300,000 pounds of derelict fishing gear into renewable electricity.

OCEAN CONSERVANCY

Ocean Conservancy leads the annual International Coastal Cleanup (ICC) effort. The NOAA MDP has supported the ICC since the program's inception, and this year marks eight years of dedication to cleaner waterways.

For the 2013 ICC, the NOAA MDP coordinated NOAA-staffed clean-up sites in Hawaii, Washington, California, Alabama, and Washington, DC.

LOOKING AHEAD TO 2014

The NOAA MDP is looking forward to launching 11 new outreach and education and research intiatives in FY14. Here is a look at the year ahead:

OUTREACH & EDUCATION

The Sea Research Foundation to educate teen audiences in Connecticut about marine debris and provide opportunities for the teens to share their work on marine debris with peers through the "Teen Marine Debris Initiative."

Oregon State University to create a comprehensive marine debris curriculum and hands-on activities for Oregon's 4th-12th grade students.

Anchorage Museum Association to create an exhibit that informs visitors about marine plastics through science and art using marine debris collected off the Alaskan coast.

Monterey Bay Aquarium Foundation to provide California's K-12 teachers with an in-depth overview of marine debris problems and solutions, along with tools for integrating marine debris lessons into classrooms through three ocean plastic pollution summits for teachers.

Ocean Conservancy to expand the educational and outreach components of Ocean Conservancy's Trash Free Seas initiative and increase hands-on experiential learning activities.

Rozalia Project for a Clean Ocean to educate youth on marine debris at schools and dockside locations on the East and West Coasts with camps, museums, community centers and waterfront organizations, using a remotely operated vehicle and STEM-education curriculum and activities.

University of Georgia to conduct shoreline surveys and cleanups with students and use the data to educate the general public, students, and teachers in North Carolina, South Carolina, and Georgia on marine debris; the project leads will also develop a traveling museum exhibit.

Florida Fish and Wildlife Conservation Commission to launch a campaign focusing on behavior change, based on 10 years of research, on the environmental impacts of lost traps from South Florida's lobster fishery.

RESEARCH

Regents of the University of California, Davis to explore how microplastics contaminated with absorbed chemicals impact species that ingest them, as well as the likelihood of microplastic particles and chemicals to be transferred to a higher trophic level.

Sea Education Association to explore how animal behavior influences the ingestion of potentially harmful microplastic particles.

Virginia Institute of Marine Science to determine which factors, such as temperature and pH, are important influences on the way chemicals and plastics interact in the environment.

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