

Table of Contents

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Committee on Environment and Public Works Washington, D.C.

STATEMENT OF:	PAGE:
THE HONORABLE DAN SULLIVAN, A UNITED STATES SENATOR FROM THE STATE OF ALASKA	3
THE HONORABLE SHELDON WHITEHOUSE, A UNITED STATES SENATOR FROM THE STATE OF RHODE ISLAND	7
THE HONORABLE JIM KURTH, DEPUTY DIRECTOR, U.S. FISH AND WILDLIFE SERVICE	12
CHRIS PALLISTER, PRESIDENT AND CO-FOUNDER, GULF OF ALASKA KEEPER	41
JENNA JAMBECK, ASSOCIATE PROFESSOR OF ENVIRONMENTAL ENGINEERING, UNIVERSITY OF GEORGIA	48
NICHOLAS MALLOS, DIRECTOR, TRASH FREE SEAS PROGRAM	54
JONATHAN STONE, EXECUTIVE DIRECTOR, SAVE THE BAY	60

HEARING ON OVERSIGHT OF THE ARMY CORPS OF ENGINEERS'
PARTICIPATION IN THE DEVELOPMENT OF THE NEW REGULATORY
DEFINITION OF WATERS OF THE UNITED STATES

Tuesday, May 17, 2016

United States Senate

Committee on Environment and Public Works

Subcommittee on Fisheries, Water, and Wildlife

Washington, D.C.

The committee met, pursuant to notice, at 10:11 a.m. in room 406, Dirksen Senate Office Building, the Honorable Dan Sullivan [chairman of the subcommittee] presiding.

Present: Senators Sullivan, Whitehouse, Boozman, Fischer, Rounds, Inhofe, Gillibrand, and Markey.

STATEMENT OF THE HONORABLE DAN SULLIVAN, A UNITED STATES SENATOR
FROM THE STATE OF ALASKA

Senator Sullivan. Good morning.

Senator Inhofe. May I make a real quick statement?

Senator Sullivan. Yes, sir.

Senator Inhofe. I have Floor time in five minutes, but I want to come back because I have a special interest in this first witness I've already talked about, so I will be right back.

Senator Sullivan. Okay, thank you, Mr. Chairman.

The Subcommittee on Fisheries, Water, and Wildlife will now come to order. The purpose of this hearing is to examine the impacts and sources of marine debris on wildlife population and potential solutions to this issue.

I want to begin by apologizing for being late. A little bit of bad traffic out there. Appreciate the patience.

More specifically, for coastal States, particularly those on the West Coast and East Coast, prevalence of marine debris on our shores is a chronic issue. Marine debris results from a number of manmade sources, including derelict fishing gear, poor solid waste management practices, major storm events, and everyday litter.

In March 2011, a large earthquake struck off the Japanese coast causing a large tsunami and tragically killing or displacing tens of thousands of people. While much of the media attention rightly focused on this tragic outcome and the related situation with the Fukushima Nuclear Power Plant, another less reported story was also unraveling.

The 2011 tsunami washed millions of tons of debris into the Pacific Ocean, most of which eventually made its way to the Pacific Northwest of the United States. In some of the most extreme examples, a 185-ton dock washed up on Washington's Olympic Coast, the U.S. Coast guard was forced to sink a floating ghost ship off the coast of Alaska before it struck the shore, and even a motorcycle was washed ashore in Western Canada.

Today, my State of Alaska is still dealing with the impacts of this event, and one of our witnesses here today will discuss his organization's efforts and experiences while cleaning this significant debris. In addition to the organizations represented here today, there are others in Alaska conducting important response and research work, such as the Sitka Sound Science Center.

NOAA has identified a number of hotspots where debris accumulate in large quantities due to ocean currents and other factors. Mostly in the Pacific, these so-called "garbage

patches" have been known by scientists for years. Yet, what is less known is the impacts of these debris on marine and land-based birds, mammals, and other species and their ecosystems. I am hopeful that today's hearing will shed some additional light on these effects and identify research gaps. While the problem of marine debris is apparent, there are also no clear answers on how to best solve it.

The United States has taken major steps to address issues here at home, and the plastics industry has proactively pursued ways to address debris in the marine environment. In Alaska and other coastal States, most debris comes from foreign sources, as evidenced by the volume of materials collected on our shores every year bearing labels written in Chinese, Russian, Indonesian and many other foreign languages.

As a result of the tsunami, in 2012, the Japanese government, in a remarkable gesture given the enormous suffering Japan endured, gifted \$5 million to the U.S. Government to assist in debris removal and response efforts. This one-time infusion of funds supplemented NOAA's modest annual congressional appropriation for the Marine Debris Program. The authorization for the Marine Debris Program has lapsed, but fortunately Congress has continued to fund this important work.

But beyond funding response and cleanup work, one of the things that we hope this Committee's experts will help us

address is how can the United States help better encourage sanitation and management practices, particularly in developing countries, as it relates to ocean debris and what innovative ideas exist to solve these problems. These are some of the questions we hope will be answered today

I am pleased to have a distinguished and diverse panel of witnesses here this morning. I want to thank all of you for being here.

Finally, I want to acknowledge and thank Ranking Member Whitehouse for his interest in this topic and his encouragement to hold this hearing. Although at first glance you might not see the similarities between Alaska and Rhode Island, being the largest and smallest States in the Union, respectively, we both love our oceans. In fact, Rhode Island is the Ocean State and Alaska has more ocean coastline than the rest of the United States combined, so this issue matters to all of us.

With that, I will turn it over to Ranking Member Whitehouse.

[The prepared statement of Senator Sullivan follows:]

STATEMENT OF THE HONORABLE SHELDON WHITEHOUSE, A UNITED STATES
SENATOR FROM THE STATE OF RHODE ISLAND

Senator Whitehouse. Thank you, Mr. Chairman. We got away with being the Ocean State by being among the first 13, when there was less competition.

Let me express, first, my appreciation to you for your interest and for this action on the problem of marine debris. As you say, Alaska and Rhode Island have many differences. But we share a common dependence on, and affection for, our healthy oceans.

To put it mildly, this Committee does not always see eye to eye on the issues under our jurisdiction. But we are on the same page today. Some colleagues may try to argue that humans aren't causing climate change. But there is no denying man's role in the startling amount of plastic trash that now litters our oceans and coasts. The problem is pervasive and obvious.

A Rhode Island example comes from one of the most dangerous and demanding sporting events on the planet, the Volvo Round of the World Ocean Race, which had a stop in Newport, Rhode Island this past summer. The sailors on those racing vessels had seen the world and they told of a littered ocean. So littered, in fact, that they had to make daily debris checks for marine

debris fouling their keels and slowing down the racing boat, even in the far-away South Atlantic waters.

Ocean Conservancy reports that the 2014 International Coastal Cleanup took over 16 million pounds of trash from beaches around the world. Save the Bay, represented here today by Executive Director Jonathan Stone, organizes Rhode Island's participation in the International Coastal Cleanup. Last September, over 2,000 volunteers participated in beach cleanups in Rhode Island. They collected more than 19,000 pounds of trash from our beaches during the single day event, and that is just a small snapshot of the bigger problem.

When plastic enters the water, it never really goes away. A study of seabirds found that in 2014, among 80 species studied, 90 percent of individual birds had plastic in their bellies. This albatross is filled with discarded lighters and other plastic junk that it mistook for food.

It is not just birds. Thirteen sperm whales beached themselves on the German coast in January with plastic in their stomachs, including a 43-foot long shrimp fishing net and a large piece of a plastic car engine cover. Leatherback turtles are found with stomachs full of plastic bags mistaken for the jelly fish on which they feed. Scientists have documented harmful plastic interactions in nearly 700 species.

Marine debris does not have to be eaten to be a hazard. Turtles and porpoises and manatees drown or starve in entanglements, as do sharks, which must move to breathe.

Through wave action and UV exposure under the sun, plastics continually break down into smaller and smaller pieces. The smallest pieces, microplastics, are ingested by a wider swath of the food chain, mixing in with plankton blooms and other elemental food sources. Plastic is now found in every corner of the marine environment, from sandy beaches on rumwood islands, to arctic ice cores, to deep sea sediments, to ocean gyres in the faraway Pacific.

Dr. Jenna Jambeck, who is testifying today, found that 80 percent of the plastic in the ocean originates from land. Each year, an estimated 8 million metric tons of plastic waste enters the oceans. At present rates, the mass of waste plastic in the ocean will outweigh the mass of all the living fish in the ocean by the middle of this century. Let me say that again. At present rates, the mass of waste plastic in the ocean will outweigh the mass of all the living fish in the ocean by the middle of this century.

Over 50 percent of the plastic waste in the oceans comes from just five countries: China, Indonesia, the Philippines, Vietnam, and Sri Lanka. Their upland waste management systems

are a failure, so plastic and other trash makes its inevitable way to the sea.

Senator Sullivan and I are both members of the Senate Oceans Caucus. Our bipartisan caucus has made marine debris a priority issue and we are determined to make progress. Perhaps the present rethinking of the Trans-Pacific Trade Agreement will give us a chance to encourage the filthy five marine debris countries to clean up their act.

Thank you again, Chairman, for calling this hearing, and I appreciate very much the wonderful panel of witnesses who have come here today.

[The prepared statement of Senator Whitehouse follows:]

Senator Sullivan. Great. Thank you, Senator Whitehouse.

Now I would like to welcome the first witness to our panel, Mr. Jim Kurth, the Deputy Director, United States Fish and Wildlife Service. You will have five minutes to deliver your opening statement and a longer written statement will be included in the record.

Mr. Kurth.

STATEMENT OF JIM KURTH, DEPUTY DIRECTOR, U.S. FISH AND WILDLIFE SERVICE

Mr. Kurth. Good morning, Chairman Sullivan and Ranking Member Whitehouse and Subcommittee members. I appreciate the opportunity to testify today, and I would note I have had the good fortune to live and work for the Fish and Wildlife Service in both Rhode Island and Alaska.

Senator Whitehouse. Rhode Island was more fun, right?

Mr. Kurth. I am not going to pass judgment.

Senator Sullivan. I was going to avoid asking you that question because I thought it might embarrass my colleague here.

[Laughter.]

Mr. Kurth. They are both wonderful places.

[Laughter.]

Senator Sullivan. Good answer.

Mr. Kurth. Marine debris, ranging from abandoned vessels to fishing gear, plastic bags, balloons, food wrappers, and many other consumer products, is a pervasive threat to the world's oceans. It injures and kills wildlife, degrades habitats, interferes with navigation, and costs communities, fishing and maritime industries millions of dollars annually. In addition, microplastics created by the breakdown of bottles, bags, and other larger debris, as well as the toxic chemicals they

contain, pose a risk to human health as they accumulate in the marine food web.

Up to 80 percent of marine debris originates on land: the litter sucked into storm drains or blown into waterways, to stray garbage from landfills, and small particles discharged from industrial operations. It injures and kills wildlife for many miles inland on its journey to the ocean.

Other debris is generated at sea from lost fishing equipment and vessels, cargo containers swept overboard and illegal dumping. Large storms and tsunamis can also deposit enormous amounts of debris into coastal areas and deeper waters.

At Edwin B. Forsythe National Wildlife Refuge in New Jersey, a storm surge from Hurricane Sandy in 2012 scattered tons of debris over a 22-mile stretch of beaches, salt marshes, and forested areas. It took months to remove the debris, which included downed trees, construction materials, appliances, glass, trash, and over 175 boats from nearby marinas, many of which leaked fuel and other contaminants. More debris was swept out to sea when storm surges receded.

As a former wildlife refuge manager, I have seen the impacts of marine debris. It is heartbreaking to see a sea turtle dead from ingesting a plastic bag it thought was a jelly fish, or to find a dead albatross chick with her stomach filled with plastics.

The Fish and Wildlife Service works through its coastal refuges and friends groups to mobilize local communities for the International Coastal Cleanup each September, an event that helps raise public awareness while removing significant amounts of debris.

Midway Atoll National Wildlife Refuge provides nesting habitat for nearly 3 million seabirds, including endangered Laysan ducks, albatross, and 19 other seabird species. Hawaiian monk seals, green sea turtles, and spinner dolphins frequent Midway's oral lagoons.

The Island memorializes one of our Nation's most important naval victories. Unfortunately, albatross and other seabirds gathering food for their chicks carry over 5 tons of plastic back to Midway each year. The stomachs of nearly all the dead chicks we see on Midway contain plastics, including cigarette lighters, parts of toys, fishing gear fed to them by their parents.

We partner with NOAA and the Coast Guard to remove between 5 and 10 tons of debris at Midway and the Northwest Hawaiian Islands annually. We have removed nearly 1 million pounds of shipwrecks at Palmyra Atoll and Kingman Reef National Wildlife Refuges. The iron from these wrecks was fueling the growth of invasive organisms, smothering some of the Islands' pristine

coral reefs. With the shipwrecks gone now, these reefs are beginning to recover.

The 3.4 million acres of the Alaska Maritime National Wildlife Refuge provide essential habitat for some 40 million seabirds, over 30 species. We have engaged with Pribilof Islanders to work with fishermen to remove nets and other debris from fur seal rookeries, and we supported cleanup efforts in the Aleutians, along the Alaska Peninsula, and in the Gulf of Alaska.

At Kodiak National Wildlife Refuge, a Youth Conservation Corps crew pulled more than 15,000 pounds of debris off the beaches of Halibut Bay a few summers ago. Efforts like these are important, but they are a short-term fix. These beaches and hundreds of miles of other beaches, marshes, and other coastal habitats nationwide start accumulating debris again at the next high tide. We focus on public education because we don't have the staff or resources to regularly patrol and clean up most areas.

This brings me to my main point: The scale and complexity of this problem outstrips the ability of any agency or nation to address alone. Stopping debris at the source is vital, and we can't do that unless we work with public and private partners at a local scale with a global focus.

Through the Federal Interagency Marine Debris Coordinating Committee, we are working to implement a government-wide comprehensive approach focused on source prevention. The future of marine wildlife depends on our success.

Thank you for the opportunity to testify. I look forward to working with you in the future to address this issue. Thank you, Mr. Chairman.

[The prepared statement of Mr. Kurth follows:]

Senator Sullivan. Thank you for that opening statement. I appreciate the fact that both in your remarks and Senator Whitehouse's remarks you emphasize the importance of volunteer communities throughout the Country, really, that are focused on that.

Let me start my questions by asking about the role of the Fish and Wildlife Service. Again, I want to thank the Commerce Committee, of which I am a member, which oversees NOAA and Oceans, and I appreciate Chairman Thune and Ranking Member Nelson for being flexible to allow us to hold this hearing here.

As you know, Mr. Kurth, NOAA is the Federal agency that is primarily responsible for being focused on oceans, but many of the species that are managed by the Fish and Wildlife Service are negatively impacted by marine debris.

What authorities or additional things can your agency do with Congress's help to better allow the Service to respond to this issue, of course, keeping in close coordination with NOAA?

Mr. Kurth. Mr. Chairman, we rely on an essential partnership with NOAA to address these resources. The area where we perhaps have the most interest is in our ocean and national wildlife refuges and marine monuments. One of the authorities we lack, that NOAA has and the National Park Service has, is to recover damages when national wildlife refuges are injured.

For example, I mentioned the ship wrecks at Palmyra Atoll. Now, while those wrecks occurred prior to becoming a refuge, so the case isn't precisely the same, had that happened today, we have no authority to recover civil damages for the effects of that shipwreck on the reef.

In the President's budget request, he transmitted a proposal called the Refuge Resource Protection Act that would give us precisely the same authority that our sister agencies have to recover damages from third parties when we are injured by them. That is an important authority that we are lacking.

But, once again, this is an important partnership that we can't do on our own without NOAA and the help of the Coast Guard and others.

Senator Sullivan. Let me ask a related question. You mentioned that Fish and Wildlife Service is a member of the Interagency Committee on Marine Debris. Can you explain to us a little bit more of the work of the Committee and whether you think it is an effective venue for coordinating the broader Federal Government's response to these issues?

Mr. Kurth. I am not an expert on that Committee, Mr. Chairman.

Senator Sullivan. Have you been to any of the meetings or anything?

Mr. Kurth. No. I am not a member of that Committee.

Senator Sullivan. But Fish and Wildlife is a member?

Mr. Kurth. Yes. And it is reflective, in my statement I mentioned that none of us can handle this alone; it requires all of the people with an interest in ocean and all the landowning agencies, the regulatory agencies that have tools to bring to the table to work together, and I think that is the focus of this Committee is it is not a problem that anybody alone can solve, and we have to bring all of the tools that we have in the toolbox together.

Senator Sullivan. Let me ask a question on the science. Do you think that the Federal Government and the scientific community has a sense of the impact of marine debris ingestion on wildlife and the broader food chain? Some of the statistics that Senator Whitehouse just mentioned in terms of how much is ingested is really stunning.

Do you think we have a good understanding of that from a scientific community? And what steps should the Service be taking to broaden the understanding, particularly to science, of these issues?

Mr. Kurth. I think that we know a great deal, but I also believe that the ocean is our last unexplored part of our planet; that there is so much about the ocean environment that we have yet to learn. The Service works in partnership with others.

For example, at Palmyra Refuge we have the Palmyra Research Consortium that includes NOAA, many of our major oceanographic research institutes to look at those core reef ecosystems in the nearby ocean waters to learn about how the ocean is changing and the effects of a changing world on the ocean environment there. There is a great deal that still is to be learned about the ocean and this topic.

Senator Sullivan. And finally, I think this will be a topic for the next panel as well, but as I mentioned in my opening statement, of course, we can always do a better job on this as a Country. But a lot of the debris, as Senator Whitehouse mentioned, comes from other countries. What are your recommendations that we can do working with other countries on this topic? Literally, my State is the recipient of their pollution, and I think there has to be a deeper way in which we can address this with these other nations, because it certainly seems like a core element of the problem.

Mr. Kurth. Well, I think you are right, perhaps this next panel will know more. I think we need to be engaged with the world because so much of this is about education. I think that in the developing world they don't necessarily have any idea what happens to the plastics and other debris that goes into the rivers and out into the ocean. There are limited resources in many of those places, but it is going to take a concerted effort

of research, of education, engagement, and then the development of technologies that can more effectively deal with this.

Senator Sullivan. Senator Whitehouse.

Senator Whitehouse. Thanks, Chairman.

Thanks, Mr. Kurth, for being here. You mentioned the albatross, and I don't want to anthropomorphize too much, but when you think how far the mother albatross has to travel in order to collect food to feed the chicks, I think that they have been banded and tracked, and they have thousands of miles that they travel. They skim the surface of the ocean looking for food, and a lighter looks a fair amount like a squid to them, so they come back to where the chicks are and regurgitate up what they have picked up.

That is how you get these pictures of the little albatross chicks starving to death with stomachs full of plastic. And sometimes it helps, I guess, when there is an image like that in people's mind to trigger their sympathies.

But I think it is also important that we understand the scale of this problem as well, and I wanted to ask you, within Fish and Wildlife, which are the programs that engage the most with the marine debris problem and how engaged are they from a budget point of view? And if that is too complicated a question to answer right in our next few minutes, could you make that a question for the record? Just give me a little layout.

Mr. Kurth. Sure. It is a complicated question. Certainly, our national wildlife refuges, our migratory bird program, our marine mammal program all have interest in this topic. And you are exactly right, these species range quite far.

I had the good fortune a couple of summers ago to be on our research vessel TECLA in the Aleutian Islands. They were feeding albatross there. I asked our crew, where are those birds coming from, and they said Midway Atoll. And I said, there is no way. I said, that is over 1,000 miles away. And the response was that is the closest land, it is the closest nesting site.

So those birds use an enormous area of ocean water, and it is remarkable how they find things like a cigarette lighter. It is amazing how many cigarette lighters there are in the ocean, and it is heartbreaking.

But whether it is the albatross or petrels or sea lions or other things, turtles, the impact from marine debris is part and parcel to what all of us in Fish and Wildlife Service care about. I would be happy to expand on that in the record.

Senator Whitehouse. And we see these pictures of the dead baby albatrosses with their stomachs filled with lighters and other trash, and we see the pictures of marine mammals that are entangled in netting or other things and have drowned or

starved. But it is harder to see the microplastic as it breaks down and gets to the level of almost molecular plastic. Could you talk a little bit about what Fish and Wildlife is doing to look at the effects of that as it enters the food chain?

Mr. Kurth. More of the science that would be done by that by the Government would be done by NOAA. As the Chairman mentioned, they really are the principal ocean research agency. We are more focused on our marine national monuments and refuges and on the species that we have jurisdiction for.

Senator Whitehouse. Are you seeing any uptake through that?

Mr. Kurth. The literature clearly indicates that, and I think your next panel will have some experts that can give you more information, and I can supplement for the record with some of the additional things that the Service is concerned about.

Senator Whitehouse. And the vast majority of vessels that might dump or wreck on marine areas that you protect are insured, so to ask them to pay their price for what they have done, I gather you are the only Federal agency with responsibility for Federal property that doesn't have the right to sue for civil damages when people harm your resource?

Mr. Kurth. Well, I can't say we are the only one, I wouldn't know.

Senator Whitehouse. Compared to the Park Service.

Mr. Kurth. Yes, the Park Service has it, NOAA has it, the Bureau of Land Management has these authorities.

Senator Whitehouse. Yes.

Mr. Kurth. And it just seems reasonable in these difficult financial times, when we don't have enough resources to do things, that if somebody damages the property of the United States, they would be liable to pay for those damages. We just simply don't have that statutory authority in the national wildlife refuge system.

Senator Whitehouse. Well, if you could summarize for me as a question for the record what the most significant ways are that your organization engages with the marine debris problem and how much budget connects to that, and also other than this recommendation for the authority to pursue civil damages, what your top five recommendations for the Committee would be.

Mr. Kurth. I would be happy to do that, Senator.

Senator Whitehouse. Thanks, Mr. Kurth. I appreciate it.

Senator Sullivan. Senator Boozman.

Senator Boozman. Thank you, Mr. Chairman. Again, thank you for holding a really very important hearing. I am from a landlocked State in regard to oceans, but certainly understand the importance and the economies of many States. Tourism is built on people from Arkansas going to the ocean.

But I want to follow up a little bit on the Marine Debris Coordinating Committee. You mentioned that you hadn't really attended the meetings.

Mr. Kurth. Generally, the Committee is attended by the people who are more focused on that topic. Unfortunately, I am in more of an administrative role.

Senator Boozman. I understand.

Mr. Kurth. And I am not the expert that I used to be.

Senator Boozman. But you all are active?

Mr. Kurth. Yes.

Senator Boozman. Good. Is that a good vehicle? Is it an area that we as a Committee should press?

Mr. Kurth. It is essential in this day and age that Government agencies collaborate and we don't duplicate. None of us have the resources to do it all by ourselves, so any mechanism that allows us to share science, to inform each other of our work activities, to get synergies out of our agencies' mission is an important thing.

Senator Boozman. As I saw the pictures and things, Senator Carper and I are co-chairs of the Recycling Caucus, and recycling plastic can result in energy savings up to 87 percent and keep the plastic out of the ocean. So it really does highlight some of the efforts that we are trying to make there, to do that.

Also, that is perhaps something that we can help some of our overseas entities that aren't doing as good a job to collaborate and show them how they can not only clean the oceans up, but also it is good for them, good for their economy.

Mr. Kurth. Absolutely. I think the United States has long led in the development of cost-effective technologies for recycling, and to the extent that we can export those to the developing world, it will certainly help in this regard.

Senator Boozman. Very good.

Thank you, Mr. Chairman.

Senator Sullivan. Thank you, Senator Boozman.

I had a few other follow-up questions, and I know Senator Inhofe was interested in following up with some questions as well.

But let me go back to an issue that I don't think is uniquely Alaskan, but we certainly have a big challenge with it, and that is the instance where owners of abandoned and derelict vessels are on the shores of different States. Certainly in Alaska there are a lot of these, they are unable to be identified, so nobody is able to be held accountable for their recovery.

In this kind of instance, which we have a number of these, do you have any ideas of what can be done to clean up this kind of debris? It is not necessarily the debris that is getting

into the digestive systems of animals, but it is still a significant problem, and it is a big problem in Alaska.

Mr. Kurth. I wish I did have an answer, Senator. When I worked in Alaska, we had a derelict vessel offshore of the Arctic Refuge where I worked, and it had been there for decades. No one quite really knew what to do about that. I think it is something that we are going to all have to come together and find out, when there is not a responsible party, how do we work together with the affected States and with government agencies that have authority, because it is a problem that doesn't have a ready answer, at least to my knowledge.

Senator Sullivan. So there is always the issue of, well, we can just fund cleanup on that, and, of course, that is one way to look at it. As you know, all agencies' budgets are kind of stretched.

The one area that I have thought about on this topic that seems to have some potential is that there are so many motivated volunteers to help with the cleanup. Are there authorities or ways in which we can encourage that to make sure that they are encouraged or kind of a Good Samaritan kind of situation in terms of the law, where if someone is going out, trying to do good work, if something happens, that they are not going to be held liable for any mistakes? Are there things that we can be doing, more innovative, more, as you mentioned, public-private

partnerships that we can do in this regard that can help an issue like that that is not just about, you know, more funding?

Mr. Kurth. Volunteers are at the heart of how we have been able to do most of the cleanup activity where there is not a responsible party. I think that we have the authority and the Fish and Wildlife Service has over 40,000 volunteers. On our national wildlife refuges, they accomplish approximately 20 percent of all the work that gets done in the national wildlife refuge system. And Congress, several years ago, did pass the Volunteer and Community Partnership Enhancement Act that gave us authority to hire volunteer coordinators.

But you are right, the effects of budget cuts have hurt. Over the last few years we saw our volunteer numbers go down because we have lost the capacity and some of these coordinators to do it. It is one of the most cost-effective investments that we can make, is to make sure we have people that can coordinate volunteer work and use it as a force multiplier for the limited staff we have. We have partnerships with volunteers and community groups in almost every aspect of what we do on the Service.

Senator Sullivan. Let me ask one final question on the foreign country issue. What programs does Fish and Wildlife Service have currently where you engage with other countries,

particularly some of the countries that Senator Whitehouse noted in his remarks?

Mr. Kurth. We have a very robust international conservation program, but it is focused more on the trust species we have and then on illegal wildlife trade. We work a great deal in Africa interdicting trade in elephant ivory and rhinos. We work with people that are illegally taking sea turtles and entering them into interstate commerce, with migratory birds.

But many of those countries in the developing world, the marine debris issue has not been the focus of our work. We work closely with China on any number of things, on wetland conservation, giving them technical assistance on rivers and protected areas, but the management of solid waste onshore really isn't the mainstay of the Fish and Wildlife Service's expertise.

Senator Sullivan. Okay. Thank you.

Senator Gillibrand?

Senator Gillibrand. Thank you, Mr. Chairman.

I am sure you are aware of the problems that Long Island and New York City face in terms of managing their solid waste and preventing contamination into our waterways. When Hurricane Sandy hit, we faced flooding and contamination on a scale that we have never seen before in our area.

What can all of us learn from that situation and how can we improve our resiliency, so the consequences of a natural disaster is not solid waste garbage contaminants floating in our waters? What have you found to have been successful?

Mr. Kurth. I think that when we look at coastal resiliency, we have to balance how we harden infrastructure and how we utilize green infrastructure. We saw, in many of the coastal areas that we manage, I mentioned Forsythe Refuge in New Jersey, where those coastal wetlands and the green infrastructure helps to attenuate storm surge and builds resilience in the ecosystems. The wetlands in Delaware at Prime Hook Refuge are another example.

So there is certainly, in places like New York City, hardened infrastructure as part of the equation, but where we can have more natural coastal features, those dunes, those coastal wetlands, they attenuate the effects of storm surges. It is not a solution everywhere, but we have been very fortunate to have significant funding after Hurricane Sandy to build resilience back into some of the coastal environments that we managed, and we think that is one component of an effective strategy for coastal resilience.

Senator Gillibrand. An unrelated question, but I know that you are an expert on this. I wanted to get your views on an important decision that the State of New York is having right

now with regard to Plum Island. Many of my constituents on Long Island and I support the idea of turning it into a wildlife refuge in order to conserve this piece of land for future generations. With your extensive background with the refuge system, can you speak to the value and benefits of creating a refuge on a location such as Plum Island?

Mr. Kurth. We are a cooperating agency in the environmental impact statement that is looking at that. As you know, there is a lot of infrastructure and potential contamination at Plum Island, so we are encouraged to continue to working with folks. But the Service is always cautious if we bring a unit into the refuge system that issues that might relate to physical infrastructure that is remaining or contaminants are addressed before it would be appropriate to be a refuge. So we continue to be engaged in and work on that study looking at the options for how we can repurpose that and include conservation as a purpose for Plum Island.

Senator Gillibrand. Another area I am interested in, I don't know if you have expertise in, but one of the concerns about marine pollutants is that plastics are broken down into microplastics, produce pollutants in the environment and often animals digest these toxic plastic pieces unknowingly and make them sick and develop other issues. We had this issue with microbeads and we were successfully able in Congress to ban them

because it had so many horrible effects for killing fish in a lot of our rivers and water bodies.

So how can these plastic and toxic pollutants affect the health of marine life and the food chain that rely on them, ultimately affecting humans?

Mr. Kurth. Well, it is just not those microbeads, but it is also the deterioration of other plastics as they break down that are ingested, and they accumulate in the marine food chain. And you are right, I confessed earlier that I am not an expert on those subjects, and I think you have some folks following me on the next panel that maybe can get more into the deeper science of it.

Senator Gillibrand. Thank you.

Thank you, Mr. Chairman.

Senator Sullivan. Senator Markey?

Senator Markey. Thank you, Mr. Chairman. Thank you for holding this hearing.

Can you talk a little bit about ghost fishing and the effect from the fishing industry and what the steps are that can be taken to reduce the likelihood of derelict fishing gear?

Mr. Kurth. Yes. Ghost fishing is a term that is used for the take of fish or shellfish after fishing equipment is either abandoned intentionally or somehow gets washed overboard, and it is very significant. I think that it is localized, so for me to

quantify it for you would be geographic specific and perhaps more than I can do. But whether it is lobster traps or crab traps or fishing nets, it continues to fish 24/7 for years and years on, and the amount of marine life that it takes from the sea is very significant.

Senator Markey. Okay. And how does that ultimately, then, affect the fishing industry from your perspective?

Mr. Kurth. Well, every fish or shellfish that is caught by derelict fishing equipment is a fish that isn't caught and the profit not returned to a commercial fisherman as part of the allowable catch for those. So it is a significant resource that is basically being wasted, where there is no return for the fisherman. It is simply a waste of a resource.

I think it is a great example of a type of marine debris that doesn't pop into people's mind. They think of the sea turtle with the six-pack or the plastic bag they have ingested, or the cigarette lighter in the albatross, and they don't think about these derelict fishing gear out there continuing to take and waste shellfish and fish for years and years.

Senator Markey. Okay. A few years ago watermen in the Chesapeake Bay region were paid to clean up derelict crab pots. Is there an opportunity to engage the fishing industry in cleaning up debris to improve the health of fisheries which they depend upon?

Mr. Kurth. Well, absolutely. I think watermen in Chesapeake Bay and people that fish for a living throughout the Country oftentimes are amongst the most knowledgeable people about those marine ecosystems. Obviously, there is a cost to that and it is something that I think that we need to look to find effective partnerships. I think some of the people that will follow me will talk about how some of the various organizations out there are at the heart of some of those partnerships, and certainly government agencies can help facilitate that as well.

Senator Markey. In your testimony you discuss successful marine debris educational outreach programs. Could you describe what one of those programs might look like?

Mr. Kurth. I love the example I used earlier of the Pribilof Islands, because it is this remote place with people whose whole life and tradition is tied to the sea, and they know and they are responsible for, and with a little facilitation and explanation, go out there and get the derelict fishing nets out of those fur seal rookeries. Some of the most important fur seal places in the world.

That is one end of the spectrum, and we can go right to Rhode Island Beach, where we get school kids out there helping, perhaps not removing tons of things, our YCC crew in Kodiak. Maybe 15,000 isn't going to change the world, but they learn

about the issue; they become engaged conservationists. They care and they can help spread that message of prevention and reuse and recycle to others in their communities.

Senator Markey. So thank you for helping to focus us upon these issues. We are just now at the fifth anniversary of the disaster which the tsunami caused at Fukushima and the amount of manmade debris that went into the ocean and traveled 4,000 miles, still traveling. So your ability to help us to focus upon this rising phenomenon of manmade debris in the ocean is just so important, so we thank you for that.

Mr. Kurth. Thank you, Senator.

Senator Markey. Appreciate it. Thank you.

Senator Sullivan. Chairman Inhofe?

Senator Inhofe. Thank you, Mr. Chairman.

Director Kurth, as I mentioned to you earlier, I have one major interest in this area. For 20 years I was a builder and developer in an area called South Padre Island, Texas. There are some areas other than the East Coast and Alaska that have beaches. It is unique with its ridley sea turtle. There are only a few places in the world where they come in and they actually lay their eggs to go back and come out, and then the little critters get out and they have to try to make their way out.

Now, one is north of Vera Cruz, one is just a little bit north of South Padre Island. That's an incorporated town. The island, you are familiar with it, others may not be, is actually 140 miles long and four blocks wide, so you can only build on the southern tip of it. But there is one area just north of that where they do come in. Nobody knows why. And just like north of Vera Cruz. Well, there is a lot of value, of course, to two sources there. One is to get the mother when she comes in to lay her eggs, because they can predict pretty much when it is, and then get the little ones going back out.

There is a lady whose name is Ila Loetscher. She was the Turtle Lady, referred to as the Turtle Lady, and about 40 years ago I would work with her. I would actually go down and sit out all night long. We would rotate around on watches to keep people from getting them as they are coming in, the value of the leather and all that. And she lived to be 100 years old and she was active. Now I think it is her granddaughter down there is doing the same thing.

Anyway, I am kind of hooked into that thing, and I am concerned because this has a direct effect. Now, what I would like for you to do is say what are things that we can do. This is protect and there is a lot of interest in there, but also there is a lot of damage that is done not just by the predators

that are waiting to get them, but by debris and things like that.

I was down there about three weeks ago and they had one tub that had a turtle that did survive. It had ingested a plastic bag, I guess it was, and I know this is just a handful. There have been a lot of issues, turtle excluders on fishing boats and all that. But what do you know about that particular species and what we can do and what you can do to be of help in that protection?

Mr. Kurth. Well, Senator, there is nothing that causes me greater fear than to think that a U.S. Senator may know more about this than I do. No, I think that the Kemp's Ridley sea turtle is one of a number of turtles that do nest along the Gulf of Mexico. You are exactly right to be fascinated about why these creatures pick certain spots. I am happy that there are still some things that science doesn't really understand. It will give a new generation the opportunity to learn and explore the oceans in ways that we haven't quite figured out yet.

But to protect, there are so many aspects of that. One is to have secure habitat; the other is to make sure that there is not too much disturbance, whether that is from predators or from inconsiderate people. I was a federal wildlife officer for the better part of a dozen years and remember patrolling beaches in Florida and seeing teenagers flip sea turtles upside down, which

is a death knell, and that is just ignorance. That is something that education has to go to.

There are other things that we don't think about. Sea turtles, when they hatch, they are going to go to the water. But if there are lights around, they are drawn to that. So we have worked with resorts and restaurants on beaches to have different kinds of lights, different kinds of direction, or turn the lights off during that time of year when sea turtles are hatching. There are just all these different facets that go into the protection of that creature.

The great thing about sea turtles is I have never met anybody who doesn't like them and isn't fascinated. If you sit on a beach and see one of those creatures crawling out of the ocean in the middle of the night, and going up there and digging its nest and laying eggs, it makes you think there is a whole bunch about this world that maybe we don't fully understand.

Senator Inhofe. And particularly those critters, because they teach them to clap, and they show and demonstrate affection. I mean, this is pretty amazing.

I wonder if a good third option there would be really education, so people know about this. If enough people do, then they would make their own force. That is what happened down there in that particular isolated area. They became very

sacred. But, again, you have the kids turning them upside down who don't know any better.

Mr. Kurth. And there are things that go along with communities caring. Just learning simple things about how to secure your garbage. Senator Sullivan has it with bears in Alaska. You secure your garbage; otherwise, you are going to have them around. And we don't need more raccoons around turtle nesting beaches because they are pretty efficient nest predators, so we just need to do more so communities understand the resources they have on their beach. And that is one of the few things it is not hard to get people to care about, and they will work with us once they understand the simple things that they can do to make a difference.

Senator Inhofe. And there are so few areas where they habitat.

Mr. Kurth. Yes.

Senator Inhofe. Well, anyway, thank you.

Mr. Kurth. Well, I appreciate your interest, Senator.

Senator Sullivan. Well, thank you, Dr. Kurth, for your excellent testimony.

I am going to ask the second panel to come to the dais.

Mr. Kurth. Thank you, Mr. Chairman.

Senator Sullivan. I am going to welcome Mr. Chris Pallister, who is the President and Co-Founder of Gulf of Alaska

Keeper; Dr. Jenna Jambeck, who is Associate Professor of Environmental Engineering at the University of Georgia; Mr. Nick Mallos, who is the Director of Trash Free Seas Program at the Ocean Conservancy; and Mr. Jonathan Stone, who is the Executive Director of Save the Bay.

You will each have five minutes to deliver your oral statement, and a longer written statement, if you wish, will be included in the record of this hearing.

Mr. Pallister, we will begin with you. You have five minutes to deliver your statement.

STATEMENT OF CHRIS PALLISTER, PRESIDENT AND CO-FOUNDER, GULF OF ALASKA KEEPER

Mr. Pallister. Thank you, Mr. Chairman and members of the Committee, for inviting Gulf of Alaska Keeper to participate in this important discussion.

GoAK members started large-scale marine debris cleanups in 2002. In 2006, we organized as a 501(c)(3) nonprofit to tackle the marine debris problem in the Gulf of Alaska. Over nine years, Gulf of Alaska crews removed 1.5 million pounds of plastic debris from 1,500 miles of relatively protected Gulf of Alaska shorelines.

In the past three years, GoAK's efforts have focused on the more remote and rugged outer coasts where debris densities range between 10 and 30 tons of plastic debris per mile. In 2015, GoAK and partners collected an additional 1 million pounds of plastic from approximately 50 miles of that shoreline. Cleanup costs on these remote beaches can surpass \$100,000 per mile. Thousands of miles remain to be cleaned.

GoAK's marine debris work has received significant support from Federal and State agencies and the Government of Japan. There is no long-term dedicated funding. Consequently, cleanup projects cannot be properly planned. GoAK is the most active Alaskan marine debris cleanup organization and the only one

whose primary focus is on marine debris remediation and removal. GoAK also conducted an extensive marine debris monitoring program and, with the College of William & Mary and the University of Alaska, researches the biological impacts on marine wildlife caused by noxious chemicals leaching from plastic marine debris.

An astounding amount of marine debris covers the Alaska Coast. Countless shipwrecks, immense quantities of creosote-treated piling and power poles, loads of treated lumber, massive metal fuel tanks and steel drums litter the shoreline. However, the most insidious debris is the vast quantity of plastic that blankets large swaths of the Gulf of Alaska Coast. In a triage forced by limited resources, GoAK focuses on plastic debris removal.

Plastic marine debris has several main sources. Over 50 percent of the plastic debris by weight on Gulf of Alaska beaches is derelict fishing debris such as lines, nets, fish totes, plastic pallets, crates, baskets, pot gear, buoys, and, among the deadliest of all, packing bands. Consumer products ranging from tiny plastic cosmetic beads to large appliances vastly outnumber all other plastic debris.

Natural disasters such as floods, typhoons, and tsunamis inject millions of tons of plastic debris in the Western Pacific, much of which ends up on Alaska's shores. Polystyrene

and polyurethane plastic foam are 30 to 40 percent of the debris by volume.

Most foam debris is from structures destroyed by natural disasters, but a sizeable component is from freezer holds of sunken fishing vessels, lost refrigerated shipping containers, cargo spills, aquaculture buoys, and deliberate dumping. Shipping container spills and shipwrecks add tons more hard plastic debris.

Plastic marine pollution is one of the most significant environmental issues of our time. Wherever scientists search in the marine environment, they find plastic debris or the chemical signature of plastic components. Plastic marine debris extends from the ocean floor to the surface. Every coastal shoreline has a fringe of plastic debris from sub-micron particles to giant blocks of polyurethane or styrene foam.

Monstrous pools of plastic debris circle in giant mid-ocean gyres, spewing out shore-bound debris when disturbed by storms. Nearly all marine organisms tested by scientists contain plastic particles or carry a biological load of harmful plastic chemicals. From the tiniest plankton to the greatest whales, plastic marine debris is exacting a largely unrecognized but terrible environmental toll.

As scientists increasingly link the ingestion of plastic chemicals with harmful health impacts, plastic debris

potentially threatens the viability of commercial fisheries. Consumption of plastic-tainted seafood and subsistence resources such as contaminated seabirds and their eggs threatens human health. Alaska's fisheries, among the world's most productive, will likely suffer devastating environmental and economic blows from plastic debris unless there is a change.

While the entire marine environment suffers from this manmade catastrophe, the Gulf of Alaska's rich coastal ecosystem has been hurt much more than most. China, Thailand, the Philippines, Vietnam, and Indonesia are the five countries responsible for the greatest contribution to the marine debris problem. All these countries fringe the South China Sea or abut the Western Pacific and are the countries that buy most of our cheap plastic goods.

Due to an unfortunate confluence of currents, storms and geography, the Gulf of Alaska's expansive coast receives a massive amount of discarded plastic debris from these countries. However, while these countries and natural disasters are responsible for approximately 90 percent of the consumer plastic debris by volume on Alaska's beaches, remember that commercial fishing is responsible for at least 50 percent of the weight of plastic marine debris on our coast.

There are no rational options other than to confront the marine debris problem; it is an international issue and, in the

case of Alaska, a problem that originates in foreign countries or from offshore fisheries largely controlled by foreign or Lower 48 fishing companies. Clearly, MARPOL Annex V, the international treaty that bans plastic dumping on the ocean, must be strengthened and its prohibitions strongly enforced. There is virtually no enforcement now.

The preventable sources of marine debris such as poor onshore waste management, intentional dumping, harmful commercial fishing practices, and reckless commercial shipping can be addressed through education and the imposition of taxes and fines to internalize the cost of removing derelict fishing gear or lost shipping cargo.

However, marine debris will always be a problem because of natural disasters, container spills, and shipwrecks. Sustained support for aggressive industrial-scale debris removal is critical. All Federal and State land management agencies with coastal habitat must include funding for maintenance cleanups in their annual budgets. They must not have the discretion to ignore this issue. Plastic debris cannot continue to pile upon coastal habitat. It is not inert; it will pollute and harm sensitive habitat and wildlife for generations.

The Federal Government must take the lead by facilitating an international response and providing significant funding to remove debris that has already landed on our shores.

Conservatively, it will take at least \$100,000,000 to clean the most heavily impacted Alaskan shorelines. We recommend that additional Federal money for marine debris removal be directly granted to State agencies such as Alaska's Department of Environmental Conservation.

Thank you.

[The prepared statement of Mr. Pallister follows:]

Senator Sullivan. Thank you, Mr. Pallister.

Dr. Jambeck, you are next.

STATEMENT OF JENNA JAMBECK, ASSOCIATE PROFESSOR OF ENVIRONMENTAL
ENGINEERING, UNIVERSITY OF GEORGIA

Ms. Jambeck. Thank you, Chairman Sullivan, Ranking Member Whitehouse. It is truly my honor to be here and my privilege.

What has become evident as I have conducted my research, sailed across the ocean sampling plastic, and visited beaches where plastic is washing up onshore with every wave is that our plastic trash is everywhere. We have heard already you find it in the deep sea and the floating polar ice, from the open ocean gyres to our favorite beaches.

So why do we care about plastic in the ocean? Well, as we have heard already, a lot of implications for wildlife. It entangles whales and seals, it fills the stomachs of our turtles and our albatrosses, and infects even the tiniest animals in our food web.

Plastics also do not biodegrade, so we have heard they fragment. This is what you find on the beach, and it starts to degrade into smaller and smaller particles. This is what washes up on the shore on the beaches and some of the microplastic, and then this is what we pull out of the open ocean. It is about the size of a tip of a pen.

So in order to respond to the scale of this problem, we need to understand how much is going into the ocean and our

aquatic systems each year. One source from the land is mismanaged waste, and that is made up of litter and inadequately managed waste. A portion of this plastic waste is then blown or washed into our waterways.

So once plastic enters our ocean, it is not visible; it is 70 percent of our planet, so in some cases we don't see it, it looks pristine, even. But to understand the potential risk to our oceans, we need to understand exposure and impact. Our research informed the exposure side of this equation, so how much plastic is entering the ocean every year. But it also made us ask, where is all the plastic going.

So in our last year publication in Science, we estimated that 8 million metric tons of plastic entered the oceans in 2010. This is equal to a volume of five grocery size bags filled with plastic for every foot of coastline in the world. So if we see business as usual, so in a projection scenario where we see increasing plastic consumption and population growth, we see this doubling by 2025, to 17 million metric tons and a cumulative input of 155 million metric tons.

So getting the plastic out of the ocean once it is there has a lot of logistical and economic challenges, so knowing the quantities we are dealing with from waste and keeping it out in the first place is important. If you start to fill your bathtub and you get distracted, and all of a sudden you run back into

the bathroom and you see your tub overflowing onto the floor, what are you going to do? In some cases you might pick up something really quick if it is going to get wet, but in most cases you are going to turn off that faucet as soon as possible and then you are going to address the cleanup.

So there are roles for everyone to play in this, and finding the most appropriate ways to tackle this problem. So when we see, we talked about this already, looked across our data, we saw a lot of middle income countries with really rapidly developing economies that haven't been able to build their waste management infrastructure because of the waste per person waste generation that happens with economic growth. So that is lagging behind.

But also in high income countries, where we have robust waste management practices, we still see inputs because of high coastal populations and large per person waste generation rates.

So we know the solutions, we have talked about some. We must cut back on plastic waste generation and increase the amount we capture and manage properly. This sounds simple. We do know how to design and manage waste systems, but waste management is more than just a design challenge, and this is something I talk about. It also has social and cultural dimensions.

So we need global participation from various stakeholders. I think there has been a lot of global diverse interest. Our discussion here today is very important and our work beyond into the future. I am optimistic that we can make headway on this problem.

So increasing reuse and recycling rates of plastic is really important. This can grow with the right economic structure in place to motivate the collection of plastic waste and the reprocessing of it. Yesterday I attended the U.S. Chamber of Commerce Sustainability Forum, and there is a lot of discussion on the concepts of circular economy and a lot of innovative things coming out of that meeting.

I think we can also consider green engineering principles and how we use plastic and what we use it for. We might redesign some products; we might substitute some materials. I think technology is another potential help similar to the marine tracker mobile app that we developed at the University of Georgia with the NOAA marine debris program. And I think there are a lot of other innovations happening in this space.

So one last thing I want you to remember today is that people are behind many of the numbers I gave you. There are people around the world picking up trash off the ground to get enough money to eat for that night. There are people around the world just learning about this issue for the first time. So I

think helping every nation develop waste management infrastructure to address the issue is critical. It keeps plastic out of our oceans and also has large economic and public health benefits.

So we hold the key to the solutions to this in the palm of our hands. By changing the way we think about waste, designing products for circular materials management, we can open up new jobs and opportunities for economic innovation. I think, in addition, we can improve the livelihoods of millions of people all around the world while protecting our waterways, our wildlife, and our ecosystems.

Thank you, Chairman.

[The prepared statement of Ms. Jambeck follows:]

Senator Sullivan. Thank you, Dr. Jambeck.

Mr. Mallos.

STATEMENT OF NICHOLAS MALLOS, DIRECTOR, TRASH FREE SEAS PROGRAM

Mr. Mallos. Good morning, Mr. Chairman and members of the Committee. My name is Nick Mallos, and I serve as the Director of Ocean Conservancy's Trash Free Seas program. I am honored to be here to speak to the Subcommittee about the growing problem of marine debris and today I hope to convey, first, the magnitude of the problem, the need for more research, and the need for systemic solutions.

Plastic debris exists in every region of the ocean. More than 8 million metric tons of plastic now enter our ocean every year. And if current trends continue, the ocean could contain as much as 1 ton of plastic for every 3 tons of fin fish by 2025.

As a marine biologist, I have been fortunate to see firsthand the harm caused by plastic debris. Plastic has impacted more than 690 species of marine wildlife worldwide. For example, plastic bags block or rupture the stomachs of sea turtles like the Kemp's Ridley in the Gulf of Mexico.

Plastics in the digestive systems of the Pacific oysters of the Northwest reduce reproductive ability by nearly 50 percent. And albatross chicks on Midway Atoll starve or choke on plastic bottle caps like the very ones you see here from Midway that

their parents feed them after foraging from thousands of square miles of Pacific Ocean surface waters.

For more than 30 years, Ocean Conservancy has been at the forefront of the marine debris dialogue, working to tackle it from every angle. Beginning on the South Padre Island, Texas beach in 1986, our International Coastal Cleanup has mobilized people all across America and more than 150 countries around the world around a single focus: keep trash off of our beaches, out of our waterways and the ocean.

Since the Cleanup's inception, more than 225 million items of trash, weighing more than 110,000 tons, have been removed from our beaches and waterways. Working with these volunteers, we have been able to construct the Ocean Trash Index, and item-by-item, location-by-location database highlighting the most persistent forms of marine debris. It is the largest database of its kind.

Consistently, plastic items are the most common debris found, making up 84 percent of all debris items collected during the cleanup. Plastics also pose the greatest threat to our ocean and our people. However, cleanups alone are not enough. We also need to stop trash from getting to the beach in the first place.

Given that, in 2011, Ocean Conservancy founded the Trash Free Seas Alliance with partners like Dow, Proctor & Gamble, and

the World Wildlife Fund to unite thought leaders from industry, conservation, and academia to create pragmatic real-world solutions to the issue of plastic debris. The Alliance is focused on a significant role that a lack of waste management in developing economies plays in plastic waste leaking into the ocean. Our 2015 report, *Stemming the Tide*, found that active efforts to improve waste management in just five southeast economies could reduce the amount of plastic entering our ocean globally by nearly 50 percent.

Stemming the Tide also stresses that efforts to minimize the amount of waste we are generating in the first place must begin now to fully address the threat of plastic debris. To its credit, Congress has long recognized this threat to our oceans by creating the Marine Debris Program at NOAA, funding clean activities all around the United States, and recently passing legislation banning plastic microbeads.

But I am here to tell you more action is needed to build better data-driven policy solutions to stop plastic from entering the ocean in the first place. This need is well articulated in a letter to the Trash Free Seas Alliance from leading marine scientists around the world. A copy of that letter is included in my written statement for reference.

Put simply, scientists and policymakers need to know more about where plastic debris originates, where it goes once in the

ocean, what happens to it when it is there, and what impact it is having on the ecosystem. Better understanding in these four key areas will help us refine and design the most effective solutions. For this purpose, we encourage Congress to fund more research.

However, we already know enough to act now. We need to work globally to support programs that improve waste management and that minimize the amount of waste being generated to keep all types of marine debris from entering the environment in the first place.

Finally, I would like to share with the Subcommittee these letters from more than 10,000 concerned citizens throughout the Country in support of immediate action to address the growing threat of marine debris to ocean health. I respectfully request they be included in the hearing record.

Senator Sullivan. Without objection.

[The referenced information follows:]

Mr. Mallos. Again, I would like to thank the Committee for inviting me to testify on this important issue, and I look forward to answering any questions you may have. Thank you.

[The prepared statement of Mr. Mallos follows:]

Senator Sullivan. Great. Thank you. That was great testimony.

Mr. Stone, you have five minutes for your oral testimony.

STATEMENT OF JONATHAN STONE, EXECUTIVE DIRECTOR, SAVE THE BAY

Mr. Stone. Thank you, Mr. Chairman and Senator Whitehouse and members of the Committee for the opportunity to be here today on this important topic. I am going to share with you a slightly different perspective on the marine debris problem.

Our organization, Save the Bay, was founded in 1970 and is the largest environmental group in Rhode Island, which, again, we are a small State, so that may not be saying too much. But we are a major force in the environmental community in Southern New England. Our mission is to protect and improve Narragansett Bay.

Much like the estuaries up and down the eastern seaboard, Narragansett Bay is one of the largest estuaries in New England and has been designated by the Federal Government as an estuary of national significance. Again, like other estuaries along the East Coast, the Bay is an important recreational and commercial resource for literally millions of people. It is also an important natural resource and habitat for commercial and recreational fisheries, hundreds of species of birds, marine mammals, shellfish, and other marine animals.

Probably most relevant to this conversation, more than 2 million people live in the 1,600 square mile Narragansett Bay

watershed. More than 90 percent of Rhode Island's population lives within a 10 minute drive of the coast.

Marine debris is a significant pollution problem in Narragansett Bay and along Rhode Island's south coast, and as Nick spoke a few minutes ago, Save the Bay participates each year in the Ocean Conservancy's International Coastal Cleanup. We organize cleanups led by volunteers across the State in Southern New England each and every year.

Last year, on a single weekend, almost 2,200 volunteers collected nearly 10 tons of trash along 65 miles of coastline, and I can tell you that virtually none of that came from the Pacific Ocean. That is a local, local problem. So the point I would like to emphasize for this Committee today is that this is not just an international problem; it is a local problem.

The next chart, the pie chart, highlights the many types of trash and debris we remove each year, everything from derelict fishing gear and tires to tens of thousands of plastic cigarette butts. I remember back in the day cigarette butts weren't plastic; they biodegraded. Now they are plastic; they do not biodegrade. We collect beverage containers, food wrappers, and on and on and on.

Most insidious and disturbing is the rapid accumulation of thousands upon thousands of fragments of plastic waste as it breaks down over time into smaller particles. These are

virtually impossible to clean up, and accumulate year after year. I have a very short video here to illustrate the point. Hopefully it will play here.

[Video played.]

Mr. Stone. Marine debris is a human health and safety hazard. It also degrades Rhode Island's iconic beaches and coastline, which attract millions of visitors each year and drive economic activity in our State. It harms animal species that inhabit the Bay. It has been observed, for example, that nesting osprey chicks suffer when they get tangled in fishing line that the osprey parents have used to construct the nest. Small bits of plastic, as you have heard from other panelists today, are ingested by fish and birds, and important coastal habitats are damaged by plastic debris.

Most disturbing of all, marine debris is a chronic problem. It is not a problem without solution. There are solutions. In Rhode Island specifically, we know that marine debris is caused by two things, illegal dumping and littering, and polluted stormwater runoff. The solution to the stormwater problem is to capture runoff in order to filter and clean it before it reaches the waterways, the Bay and the coast. This requires investments in ongoing maintenance in stormwater infrastructure.

The Federal Government plays an important role through the Department of Transportation the U.S. EPA to encourage States to

develop stormwater management programs and to assist States in the design, construction, and maintenance of stormwater infrastructure.

Our experience in Rhode Island is that stormwater improvements have additional benefits that go far beyond marine debris, including reducing beach closures due to bacterial contamination, protecting drinking water supplies, reducing localized flooding, making neighborhoods more pleasant and livable.

Thank you very much for your attention to this important topic. I appreciate the opportunity to be here.

[The prepared statement of Mr. Stone follows:]

Senator Sullivan. Well, thank you, Mr. Stone.

I want to thank all of you for your outstanding testimony and what you do beyond the testimony here. You are all leading organizations or in research to help address this problem, and very much appreciate that.

I want to ask a few follow-up questions.

First, Mr. Pallister, I appreciated your testimony where you said, look, it is a big issue, but sometimes you need to prioritize, and you came down squarely in terms of the prioritization with regard to plastics, is that right?

Mr. Pallister. Yes, correct.

Senator Sullivan. And let me just ask the other panelists, would all of you agree with Mr. Pallister? If we were going to be really trying to focus on this prioritize our efforts, would that be the proper area to focus on? Is everybody in general agreement on that, plastics?

Mr. Mallos. Yes.

Senator Sullivan. I feel like I am in the movie *The Graduate*, right?

Mr. Mallos. Yes. I would say I completely concur that plastics are the priority focus. But I think when we think about solutions, particularly as it pertains to many of the developing economies, as spotlighted by Dr. Jenna Jambeck's and others' work, simply addressing plastics in the waste stream is

not a viable option. You actually have to address the entire waste stream to ensure you are mitigating the threat of plastics.

So completely agree plastics is the most concerning part of the marine debris issue, but solutions may look at managing the entire waste stream.

Senator Sullivan. Look, Mr. Mallos, I thought you made a really good point about when we do cleanup, we are treating the disease, but we are not really preventing it, and we need to look at how to prevent it. So let me get back to the issue of the international element to this.

Dr. Jambeck, you focused on that and, Mr. Pallister, I think you also talked about 90 percent, which was pretty stunning. Does the majority of this plastics debris from these five countries come from the shore? We have had a treaty, the MARPOL Treaty, which I am sure you are familiar with, but that focus is on dumping from ships. Does this debris that we are talking about, particularly from the five developing countries, come from the shore? And you have touched on it, Dr. Jambeck, you touched on it in your testimony, why is this such a problem?

Ms. Jambeck. So just going into a little bit more detail of the research, what we did is look at a 50 kilometer buffer in 192 countries around the world. It is the coastline, and

population density is a large driver, as well as the quantity of waste that each person in that area creates.

Senator Sullivan. So it is pollution that is coming from shores, not ships.

Ms. Jambeck. Correct.

Senator Sullivan. And why do you think those five countries? Senator Whitehouse, he emphasized it. What is going on there that is not going on in other countries?

Ms. Jambeck. So these are middle income countries who have started to have rapidly developing economies, which means that there is a lot of influx of, I would say, consumer goods and a lot of packaging. So as people are able to afford those kinds of goods, unfortunately, the waste management infrastructure in those countries to handle the waste is absolutely science shows that there is a coupling between economic growth and waste generation. So the infrastructure isn't there to handle it.

Also, the increase in plastic in the waste stream has happened very quickly. The production of plastic around the world went all the way up to 311 metric tons. So it is also an awareness, and I think someone touched on this. People don't know the implications of plastic in the environment. Things weren't made of plastic before, so they are having to have a mind-shift of both infrastructure and then having this new waste stream that they need to address.

Senator Sullivan. And in your research have you gone to a number of these countries?

Ms. Jambeck. I have been to India, which is one that has a pretty extreme case as well.

Senator Sullivan. And do you think that most of them would recognize that they have a problem or would they be kind of like, hey, we don't really have a problem here?

Ms. Jambeck. No, I think they do know. And there is a lot of grassroots efforts within these countries, and I think working with folks in the countries in a context-sensitive design is important when addressing the issue.

Senator Sullivan. So we have one international convention, the MARPOL Convention, as I mentioned, that addresses this from ships. Do you think that we need to do something else from an international perspective that addresses this issue, particularly plastics from shore?

Ms. Jambeck. I think that there is a lot of great discussion happening at the United Nations level. I think the U.S. should be a leader and helping in those discussions. And I know that there is a meeting happening later this month, and I am hopeful that there will be some resolutions.

Senator Sullivan. Let me ask one final question.

Mr. Mallos, you talked about the Trash Free Seas Alliance. I think that is a really interesting group that brought together

the scientific community, environmentalists, industry. Can you explain a little bit more on what was the origins of that, how it has worked? Because, to me, the way we need to address this, certainly we need to get our international partners engaged, but all different stakeholders engaged as well, and you seem to have done that already through this Alliance.

Mr. Mallos. So the Trash Free Seas Alliance was founded in 2011 and it is really built on the existing successful models seen in the sustainable seafood movement, alliances that were out there in the tropic forest alliances and others. The mandate of the Alliance is really to bring together all of the diverse stakeholders that need to be a part of the discussion.

This is a massive problem and there is no silver bullet. So we are going to need a holistic solution that includes minimizing the amount of waste we are generating, better managing the amount of waste that is currently in the system, and mitigating the waste that is already out there through cleanups and other mechanisms.

So bringing together the members of industry who are either manufacturing plastics or making goods out of the plastics, bringing together the thought leaders in academia like Dr. Jenna Jambeck and others who are providing us novel, groundbreaking science on this, and then bringing together the NGOs and conservation organizations that are trying to drive forward

policy solutions together build and provide us the necessary arsenal of weapons to actually tackle this issue at all angles.

As I noted, currently we are providing working to try and jump-start waste management in these developing economies, and I think it is really important to underscore that this is not currently a China problem or a Philippines issue, but this is, rather, an unintended consequence of rapid development. So thinking about how we work in these countries with the folks on the ground that are already leading this issue and already recognize that waste management is a challenge, coming at it from that angle and bringing together the global resources like the members of the Trash Free Seas Alliance possess is a winning recipe.

Senator Sullivan. Great. Thank you.

Senator Whitehouse?

Senator Whitehouse. Thank you very much.

Thank you to a terrific panel.

Let me start with Mr. Pallister. You used a phrase in your testimony, the "chemical signature of plastic components." Could you elaborate on that phrase?

Mr. Pallister. Yes. It has always been my fear that the chemicals in plastic are much more dangerous than the physical things they cause, like ingestion, entanglement and everything. It reminds me of Rachel Carlson's Silent Spring and all the

chemicals were killing the birds in mass quantities compared to them getting killed by power lines and things like that.

But now scientists are looking and they are finding chemicals from plastic, all inherent chemicals, the metabolites that break down from the chemicals, in all kinds of marine organisms. I think Dr. Jambeck would attest to that, too. And a lot of those chemicals are very, very toxic; they have very significant impacts on human health, and one of the primary researchers on a paper that was just published on thiolate is in the room here and she would know more about this than I, if you want to talk to her later.

Senator Whitehouse. So you start with a piece of plastic that is floating in the ocean; it degrades and degrades into tiny little bits. Ultimately, those tiny little bits get taken up by some tiny little creature, and in that creature it can deteriorate further or be absorbed in a way that lets the chemicals loose from the plastic, and at that point, as creatures feed on it, it begins to bio accumulate up the food chain, is that right?

Mr. Pallister. That is exactly right. And the chemicals like pthalates that are put in the plastic to make it softer aren't very strongly bonded to the plastic and they leech out very easily.

Senator Whitehouse. So this could come home to roost in Alaskan salmon or other fish?

Mr. Pallister. Oh, absolutely. The one slide we had there, the researchers are finding pthalates in practically every marine organism they look at up there and nobody is really putting a lot of time and money into that, and to me I think it is a tremendous threat not just environmentally, but also to human health and the commercial health of our fisheries up there. It would be just devastating if the loads of pthalates get so high that we can't eat the fish.

Senator Whitehouse. Dr. Jambeck, the plastics that you have studied, how long do the various major types of plastic last? What is their curve as they biodegrade?

Ms. Jambeck. So they fragment over time and we don't really know.

Senator Whitehouse. How much time? Are we talking centuries?

Ms. Jambeck. You know what? We were in our scientific working group starting to address sort of the mechanisms and the speed of fragmentation, and we are not there yet; we don't really know. We know that it goes in, like I said, like this, and then on the beach it is washing up here. But it is a very long period of time, we suspect, but at the same time we already are seeing these fragments and a lot of this plastic has gone in

in the last 50 years. So we really need to know more about that and we really need to do more research.

Senator Whitehouse. Mr. Mallos, what do you think about the notion of biodegradable plastics? Is that just a way of accelerating this bad process or is there some better way to deal with that issue?

Mr. Mallos. So biodegradable plastics are designed to break down biologically in very specific industrial settings. Standards exist that test and guarantee that those plastics will in fact perform that way when applied with X temperature. The challenge is those conditions exist very few places in the natural environment.

And particularly when we look at the ocean environment, which has cooler temperatures, wind and radiation, UV radiation, etcetera, we know that biodegradable plastics perform just like traditional plastics, in fragment at a rapid rate. So certainly there is need for more research to look at material and product innovation and design, but at the moment biodegradable plastics are not a solution to the ocean plastic problem.

Senator Whitehouse. And, Mr. Stone, in terms of the array of stuff that Save the Bay sees coming ashore in Rhode Island, which in our case has probably not been coming from those Pacific countries, it would have to travel a very long way to get there, a lot of it appears to be packaging. Are there

efforts that can be undertaken or should be undertaken to brand some form of ocean-safe packaging, so that a consumer can have a sense that this product will in fact biodegrade in a proper way and try to move the consumer towards seeking a better product in the same way that people go out of their way to buy dolphin-safe tuna if they are given the choice?

Mr. Stone. It is a good question. I think the rule of prevention is the path that probably is going to give you the most effective method of reducing pollution at the source. So I think what you have raised gets to this biodegradable question about how can packaging companies innovate in ways that produce materials that do degrade and are more environmentally friendly, and I think to the extent that the products actually perform as promised, that is probably a step in the right direction.

But I think there are other things that are as important. Recycling ends up being extremely important, getting people to reuse recycle to prevent these packaging products from entering the environment and to be contained within the normal waste stream is the first step. That way you don't have the products washing into the environment off the streets and off the urban landscape. And in the Far East the runoff issue is the primary source. It is mostly this heavily developed landscape that is sort of where these plastic products come from when they end up in the sea.

Senator Whitehouse. My time is up, but I really want to thank Chairman Sullivan for hosting this. I think this has been a very productive, well-attended, and bipartisan hearing. I think that the witnesses have been terrific.

I would like to make it a matter of public record that Dr. Kurth is still here. He stayed to listen to the witness testimony. I don't know that I have ever actually seen that before. Usually, Administration witnesses scoot for the door the instant that they can. So I think it is significant that he stayed to listen through all of this, and I appreciate him doing that. And I hope that being called out that way is not inappropriate, but I was impressed.

My final comment will be that I, in my opening remarks, mentioned the Trans-Pacific Trade partnership. For those of us who are very skeptical about the extent to which it bakes in false advantages for products that are made in those countries, the false advantage of not having an effective water management system in your country, so that you dump millions of tons of plastic into the world's oceans and that makes your products cheaper compared to a competing American product that not only has to support its own cost, but the infrastructure cost of a working waste management system, is exactly the kind of advantage that, first of all, makes me nuts about that agreement.

But it gives us a real, I think, opportunity to focus on that is no fair basis on which to make a trade distinction. The more we can drive these countries to clean up their act, I think, as Dr. Jambeck said, you surge up into a level of economic development where you are starting to use plastic for the first time and it becomes ubiquitous, but you have a concomitant responsibility to bring your waste management infrastructure up to snuff as well. And if we are not going to urge them to do that through our trade policies, then shame on us.

But again, Chairman Sullivan, thank you for letting me go over here a minute and thank you for this hearing.

Senator Sullivan. No problem, Senator Whitehouse. Matter of fact, as Chairman of this Committee, I am going to take the prerogative to ask just a few more follow-up questions, and if you have any more, feel free to ask.

I just want to, first, thank the Committee again. This has been a really good panel.

Mr. Pallister, given that you have traveled quite a distance here, from Alaska, to come testify, I wanted to ask another question to you, a little more Alaska-specific. Can you describe some of the challenges on the cleanup of marine debris that we face in parts of the Country, Alaska, but there are

other parts that have very, very remote areas, very remote areas of our coastlines?

Mr. Pallister. It is extremely difficult in Alaska because we have virtually no shoreline that has vehicle access to it, so you get there by boat or you get there by air, and right now we are working on Montague Island, which is a notoriously horribly polluted area. We have 10 people out there working. We have to move them with helicopters. So you can imagine the cost. And this is a shoreline where 30 tons of plastic debris per mile exists. It is extremely rugged; the weather is horrible.

Senator Sullivan. Did I hear that right? Say that again.

Mr. Pallister. Thirty tons of plastic debris per mile. Montague has 74 miles of shoreline just like that, and we have been working on it for three summers now and we have only cleaned 9 miles of it, and it is costing a tremendous amount of money. And we are a nonprofit. We are not in it for the money; it is by the seat of our pants. It is a dangerous place to work, it is incredibly challenging and there are thousands of miles like that along Alaska coasts, and it is extremely rich.

But I wanted to go to back to the Trans-Pacific Trade Treaty you are working on now. There is an opportunity here because shipping is protected under an international treaty, but here is an opportunity. There are a lot of shipping companies

that lose containers and nobody ever goes after them for the damage they cause onshore.

In 2012, January 2012, the China Ocean Shipping Company's big transport ship, the Yokohama, lost 29 containers in the Northern Gulf of Alaska. The debris from those containers has now spread over thousands of miles of shoreline. So this is kind of official notice to the Federal Government now, you have a statute of limitations of two years for the landowners, which would be the Forest Service and the Fish and Wildlife Service and the rest of them, to go after the China Ocean Shipping Company for damages to clean all that up. You are talking tens of millions of dollars of potential resource for cleanup work.

Also, that big ship, I think it was a ship that went down in the Bermuda Triangle last year and killed a bunch of sailors, but it also lost two hundred and some containers. Nobody is talking about getting recovery for the plastics that are going to be coming out of those containers for generations, and it is something that ought to be explored.

Senator Sullivan. Thank you.

Mr. Mallos, one other. I am very interested in some of the alliances that you have worked on. In 2011, the global plastics industry led an international effort that resulted in the Global Declaration for Solutions on Marine Litter. Can you talk a

little bit about that, what motivated the stakeholders to do that and what has been accomplished since its adoption?

Mr. Mallos. So the Declaration on Marine Litter was announced at the 5th International Marine Debris Conference in Honolulu, and I think what the Declaration underscores is the recognition and acknowledgment by the global plastics industry that they have a role and responsibility in crafting solutions. We believe very strongly that the plastics industry and the consumer goods industry has a role to play in not only helping to develop solutions, but also looking at ways to finance and provide resources to implement solutions.

That is precisely what we created the Trash Free Seas Alliance platform to do. And it is worth noting several of the signatories to the Declaration are in fact members of the Trash Free Seas Alliance and are quite active in helping us look at how we not only craft solutions, but implement them looking at the political boundaries, looking at the management systems currently in place. So there is the recognition by the industry and there has been active engagement and solutions put forth by them to tackle this problem.

Senator Sullivan. Well, listen, I want to thank the panelists again. This is one of these issues, in my view, that not enough members of Congress, not enough Americans are aware of, and it is certainly something that we should all be

concerned about. And I do think that what you have done, and it is a very important service, is not only describe some of the challenges, but put forward ideas for solutions both at the cleanup stage, but also at the origins of this problem.

So I can tell you Senator Whitehouse and I are already talking about maybe looking at some ideas to address this, so I think you have furthered a bipartisan consensus on the need to take action here. So we will stay tuned. But thanks again for all your hard work. Thanks for your excellent testimony.

I will let Senator Whitehouse close here.

Senator Whitehouse. Just before we sign off, I would like to offer each of these four witnesses the same opportunity offered Dr. Kurth, who is still here, which is to give us a highlight reel of up to, say, five recommendations that you would make to Senator Sullivan and myself by way of things that you think we could do to be helpful; and that will give us a good array of ideas to consider.

I thank all the witnesses. I thank the Chairman.

Senator Sullivan. This hearing is adjourned.

[Whereupon, at 11:46 a.m. the subcommittee was adjourned.]