

**PREPARING FOR MARITIME TRANSPORTATION  
IN A CHANGING ARCTIC**

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**HEARING**

BEFORE THE

SUBCOMMITTEE ON OCEANS, ATMOSPHERE,  
FISHERIES, AND COAST GUARD

OF THE

COMMITTEE ON COMMERCE,  
SCIENCE, AND TRANSPORTATION

UNITED STATES SENATE

ONE HUNDRED FIFTEENTH CONGRESS

SECOND SESSION

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## **PREPARING FOR MARITIME TRANSPORTATION IN A CHANGING ARCTIC**

**THURSDAY, DECEMBER 6, 2018**

U.S. SENATE,  
SUBCOMMITTEE ON OCEANS, ATMOSPHERE, FISHERIES,  
AND COAST GUARD,  
COMMITTEE ON COMMERCE SCIENCE, AND TRANSPORTATION,  
*Washington, DC.*

The Subcommittee met, pursuant to notice, at 9:30 a.m. in room SR-253, Russell Senate Office Building, Hon. Dan Sullivan, Chairman of the Subcommittee, presiding.

Present: Senators Sullivan [presiding], Wicker, Fischer, Gardner, Young, Baldwin and Schatz.

### **OPENING STATEMENT OF HON. DAN SULLIVAN, U.S. SENATOR FROM ALASKA**

Senator SULLIVAN. Good morning. The Subcommittee on Oceans, Atmospheres, Fisheries and the Coast Guard will now come to order. I want to thank our witnesses, many of whom have traveled from far places like Alaska to come to this hearing and talk about an issue that has been actually highlighted quite a lot recently in the media, but the Arctic seas have historically been considered impassable and impractical to maritime transportation routes. But the retreat of Arctic sea ice, better ice-breaking technology and global demand for Arctic resources has led to an increase in human activity and has raised interest and concerns about the future of the region.

Today's hearing is intended to bring together different stakeholders from across different disciplines to more fully understand what challenges and opportunities lay ahead and what is currently being done to ready the Nation for a changing Arctic.

Data provided by NOAA indicates that as 2011, Arctic sea ice was 42 percent thinner than it was in 1979. If this trend continues, the Arctic Ocean may be ice free during the summer months within the next 20 years. It therefore, behooves our Federal Government, all of us, private industry and Arctic stakeholders to fully focus on preparing for this new eventuality.

[Chart.]

Senator SULLIVAN. I have a chart here that shows already, it is possible to safely navigate the Arctic via the Northwest Passage or the Northern Sea Route, as you see in the blue and the orange here. These routes can save shippers weeks in travel and are thousands of nautical miles shorter when compared to using the Suez Canal or Panama Canals. Yet much of the critical infrastructure

needed to support an increase in safe shipping does not currently exist, particularly in the United States, which is an Arctic nation because of my state, the State of Alaska.

The challenges in the Arctic are manifold, including the lack of an American port, ice breaking capabilities, increased demands for search and rescue, environmental response, vessel traffic safety and security, law enforcement, and fisheries resource management.

One chief concern among these challenges is the lack of a deep water port within close enough proximity to serve as a staging area for search and rescue, pollution response, environmental concerns, and Arctic security operations.

Currently, the closest U.S. port to the Arctic is Dutch Harbor in Unalaska which is nearly 1,000 miles away from the Arctic Circle. This is almost like having a port based in Florida taking care of operations in Boston. Nobody on the East Coast would tolerate that situation.

Further, much of the hydrographic survey data relied upon for safely navigating the Arctic region is a half a century old, if not older. Consistent and reliable communications within the northern latitudes is also a great concern. Limited satellite coverage, poor transmission of radio signals and sparse cellular phone networks all contribute to difficulty in operating in the Arctic in terms of communications.

Overcoming these hurdles will take a whole of Government effort. Working with industry, non-Governmental partners, Arctic communities and strong international cooperation to ensure the consistent flow of commerce and the preservation and protection of the natural Arctic environment.

The U.S. Coast Guard, one of the prime Federal agencies involved in securing America's future in the Arctic, has begun its Arctic Port Assessment Route Study. This study will analyze current vessel traffic, projected increases and will make recommendations for future rulemaking, actions, or appropriate international agreements as it pertains to vessel routing, traffic separation schemes and other related measures. And I applaud the Coast Guard for their proactive measures and look forward to reviewing their findings.

The United States, of course, is not alone in its efforts to facilitate safe commerce and activity in the Arctic region. As a member of the Arctic Council, along with other Arctic nations like Canada, Russia, and the Nordic countries, we are working together in a consensus-based inter-Governmental form which aims to promote environmental, social, and economic aspects of sustainable development in the Arctic.

The council is critical to successful implementation of the international code for ships operating in polar waters. President Putin, though, has also mentioned that he views the Arctic as the next Suez Canal and the Russians intend to control it, which I do not think is in America's interest.

The potential in the Arctic is hard to fully quantify for more efficient shipping routes to supporting and enabling America's blue economy, the Arctic is a great resource, one for which we must begin preparing for today to ensure we can maximize its potential while also protecting its environmental integrity and importance.

With that, I want to again thank our witnesses for being here today. I look forward to hearing their thoughts on these issues, and I now recognize the Ranking Member for any opening statements that she may have.

Senator Baldwin.

**STATEMENT OF HON. TAMMY BALDWIN,  
U.S. SENATOR FROM WISCONSIN**

Senator BALDWIN. Thank you, Senator Sullivan: I appreciate your convening this important hearing. The Arctic is rapidly changing as many countries, including the United States, look to expand their presence in the region. It is becoming increasingly important that we chart a thoughtful course that simultaneously seeks to promote international cooperation, environmental protection, and efficient commerce, while protecting our Nation's security.

Even though my great State of Wisconsin is a long way from the Arctic Circle, though sometimes the winters feel similar, I have some perspectives that I would like to share as some of the emerging issues in the Arctic are already underway in the Great Lakes.

The Great Lakes region faces similar changes to the Arctic with regards to experiencing climate change effects and the need for additional ice breaking capability, accurate nautical charting, and methods to respond to an oil spill in icy conditions.

The Great Lakes have been a major commercial shipping hub since the late 19th century. We have the Lakers, that carry cargo between the lakes and the Salties that enter the lakes from the Atlantic Ocean via the St. Lawrence Seaway. These vessels transport large amounts of iron ore for the steel industry, coal for power generation, stone for construction, and grain for both domestic and international consumption. There are more than 100 commercial ports in the Great Lakes. The St. Lawrence Seaway Transportation System handles about 230 million metric tons of cargo each year.

Wisconsin's Great Lakes ports alone, moved approximately 27 million metric tons of cargo and generated \$1.4 billion in economic activity. Direct and indirect spending supported just over 7,400 jobs last year.

Great Lakes cargo shipping makes sense. It saves \$3.6 billion in transportation costs compared to the cheapest land based transportation. But it is not always easy. Safe and efficient shipping depends upon reliable nautical charts, and currently, these maps need to be updated for the Great Lakes.

There are infrastructure challenges of maintaining ports, locks, and seaways. There are environmental consequences like water quality degradation and invasive species that cost the Great Lakes economy over \$100 million in losses each year. And there is the issue of winter ice and ice breaking.

Historically, winter weather conditions on the Great Lakes have been relatively consistent and timing the shipping season and the aid of Coast Guard ice breakers has insured relatively few delays, but climate change is creating more variable winter conditions in the Great Lakes, with some winters being much icier than others, and this poses major risks to shipping. The winters of 2014 and 2015, when ice cover on the Great Lakes peaked at an average of over 90 percent, icy conditions caused delays in shipments, includ-

ing ships getting stuck in the ice, like the cargo ship *Arthur M Anderson* in 2015.

It was two Canadian Coast Guard ice breakers that broke it free to transport iron ore from Wisconsin to Ohio—not our own. The Lake Carriers Association estimated that ice-related shipping delays during these two winters cost the industry \$705 million and \$355 million in lost revenue, respectively.

Even during last year’s relatively milder winter shipping season, the Coast Guard experienced significant lost operation hours on their ice breakers due to maintenance issues. That is why I have been and remain an advocate to ensuring that the Coast Guard gets another ice breaker that is at least as capable as the Mackinaw. The Great Lakes needs to ensure safe and continued maritime commerce.

Senator Sullivan, the need for additional ice breakers in consideration of climate change impacts on ice cover and infrastructure challenges are shared between the Arctic and the Great Lakes, and there is a lot that I think we can agree on. And I look forward to working together to ensure safe shipping in these regions, and I look forward to hearing from our witnesses this morning.

Senator SULLIVAN. Thank you, Senator Baldwin. I think it is a great point that certainly we have a lot to learn from, in terms of, how the Great Lakes have operated and a lot of common interest, including our ice breaking fleet both for the Arctic region and the Great Lakes region.

Again, I want to welcome our witnesses. We have a number of my constituents who made the long trek from Alaska. We very much appreciate that. Starting from my left, we have Captain Ed Page, who is a retired Coast Guard Captain, is currently the Executive Director of the Marine Exchange of Alaska; Kathy Metcalf, the President and CEO, Chamber of Shipping of America; Willie Goodwin, Chairman of the Arctic Waterways Safety Committee; and Andrew Hartsig, who is the Director of the Arctic Program for the Ocean Conservancy. You will each have 5 minutes to deliver an oral statement and we will, of course, submit a longer written statement to be included in the record for the testimony and official record of this hearing.

We will begin with you, Captain Page. Thank you and welcome.

**STATEMENT OF CAPTAIN EDWARD PAGE, U.S. COAST GUARD (RETIRED) AND EXECUTIVE DIRECTOR, MARINE EXCHANGE OF ALASKA**

Captain PAGE. Thank you, Senator. Mr. Chairman, distinguished members of the Subcommittee, I am honored to testify before you today regarding preparing for the increased maritime activity anticipated in the Arctic region.

As mentioned before, my name is Ed Page, I am the Executive Director of the Marine Exchange of Alaska, which is a nonprofit maritime organization established to provide information, communication services to aid safe, secure, efficient environment maritime operations.

And my comments today are based on my 50 years of maritime experience—30 of which have been in Alaska. My comments also comport with the interest of my Board of Directors who are the

maritime ministry of Alaska: fishermen, vessel operators, ports and pilots, and communities.

The nature of maritime traffic in the Arctic, as much before, is evolving, has more operators, our testing viability of operating and transient waters of new maritime frontier. I commend this Subcommittee for looking forward-looking ahead to ensure that we do it right, we close the barn door before the horses get out, if you will.

I embarked on my maritime career in 1968 when I entered the Coast Guard Academy and first sailed to Alaska in 1973. And since then, I have experienced Arctic waters from the decks of Coast Guard vessels tankers, off-shore supply vessels, cargo ships, and oil spill response vessels. And in doing so, I have learned the Arctic is a lot different. It is more remote. It has challenges to the cold, the darkness, the presence of ice, environmental sensitivity and other challenges of lack of other activities, and infrastructure support a vessel in trouble.

It is a new maritime frontier, and it is the Wild West. I also served as Chief Environmental Protection for the Coast Guard during the Exxon Valdez oil spill. During that period, I spent 3 years, over which there was two and a half billion dollars expended, and 10,000 people involved in spill response. My takeaway from the experience, we need to do a better job of preventing. Prevention is the focus.

Later in my career, I served as the Captain of the Port Los Angeles, Long Beach, and during that period, we developed a joint partnership with the State of California, the Coast Guard, and the Marine Exchange of Maritime Ministry developed a vessel tracking system to ensure maritime domain managed for its very complex port. I took that model and retired from the Coast Guard in 2001, started the Marine Exchange of Alaska, but today, it operates one of the largest tracking systems in the world in its private nature, encompasses 1.5 million square miles. We have a 24-hour-a-day operating center and it is supported by the Coast Guard, NOAA, the State of Alaska and the maritime industry. It is a public-private partnership on steroids, in my mind, for the maritime industry.

As noted by the Coast Guard Commandant Schultz recently in his policy vision for enabling maritime commerce, he recognized increasing accessibility to the Arctic, also introduced some increased risk. To that end, the Coast Guard R&D Center embarked with a joint project with the Marine Exchange of Alaska called the Arctic Next Generation Navigational Safety Information System. And it recognized basically that they are not going to continue to put buoys and lighthouses to provide aids and navigation for mariners in the Arctic. Buoys do not stay in place in ice. So this 5-year project that was undertaken demonstrated the use of technology to transmit virtual buoys in ice conditions and other broadcast information, safety information, vessels a more expedient way, clear way, digitally. The project was just completed a little while ago. I urge that we take this concept, which we used—we built 235 transmitting stations in the Alaska to demonstrate the viability of this and continue moving on to an actual capability that is fully implemented for the Arctic, providing information to vessels transiting those waters.

With the help of the Arctic Domain Awareness Center, we have been able to take this automatic identification system of tracking vessels and even squeeze more value out of it, and one of those projects has been identifying the historical transit of vessels and provide the information NOAA to system and focus in which areas need to be charted. Basically, charting where vessels are going. Also this information is used to help the Coast Guard and the PAR study for the Bering Strait, and again, that now has been implemented since last week, and I believe that is going to be going for the rest of the Arctic, which I think fully support.

Also in western Alaska, we have developed an industry-led alternative planning criteria, which focus more on prevention and this is implemented by the Alaska Maritime Prevention Response Network, proven very effective. It is monitoring vessels, setting track lines, implementing more spill response equipment. There have been some missteps as of late as far as interpretation of that policy that I believe has been very successful, and I am pleased to see that Congress is having that looked at, studied again and hopefully, re visit and turn more toward the prevention side and less toward response, reactive side.

I also support expanding the capabilities of Nome, so they can provide the logistic support that the Coast Guard, NOAA and other vessels and the Polar Security Cutters makes all the sense in the world. Right now, our vessel breaks down in the Arctic, it is like looking for a tow truck if you are broken down in D.C. and find it in Denver, a couple of days away, so.

Thank you for your time. I stand prepared to answer your questions.

[The prepared statement of Captain Page follows:]

PREPARED STATEMENT OF CAPTAIN EDWARD PAGE, U.S. COAST GUARD (RETIRED) AND EXECUTIVE DIRECTOR, MARINE EXCHANGE OF ALASKA

### **Introduction**

Mr. Chairman, distinguished members of the Subcommittee, I am honored to testify today regarding preparing for maritime transportation in our Nation's changing Arctic. My name is Ed Page and I am the Executive Director of the Marine Exchange of Alaska a non-profit maritime organization I founded in 2001. My comments today are based on my 50 year maritime career of which 30 have been in Alaska. My comments also comport with the sentiments of the Marine Exchange's Board of Directors.

I embarked my maritime career in 1968 upon entering the Coast Guard Academy and over the following 33 years sailed on Coast Guard vessels and served in a variety of marine safety assignments in the contiguous United States, overseas and Alaska. I've had the opportunity to experience Arctic waters from the deck of a Coast Guard vessel, tankers, offshore supply vessels, cargo ships and oil spill response vessels. Later, while serving as the Chief of Marine Environmental Protection for the 17th Coast Guard District (Alaska region) during the Exxon Valdez oil spill it became evident to me greater emphasis should be directed towards preventing marine casualties. Despite the three-year spill response, during which thousands of responders were employed and over 2.5 billion dollars expended, there are still adverse impacts to Prince William Sound. The effectiveness of oil spill response is similar to success in fighting forest fires. While response capabilities are needed, increased focus on prevention clearly provides the best return on investment. Later, as Captain of the Port for the LA/LB port region I learned the value of public/private partnerships in establishing a joint Coast Guard, State of California, and marine industry vessel tracking system. I retired from the service in 2001 to establish the non-profit Marine Exchange of Alaska, to provide the Alaska maritime community an organization with the capability to agilely implement technological solutions and standards of care to enhance maritime safety.

Arctic waters are far different than other waters of the U.S. Arctic waters are environmentally rich but fragile, remote, subject to extreme cold and at times covered in ice. Due to the lack of resources, responding to a marine casualty in the Arctic is more challenging than anywhere else in the U.S. Fortunately, as demonstrated in Coast Guard Commandant Schultz's recent Vision for Enabling Maritime Commerce, the Coast Guard recognizes increased accessibility to Arctic waters introduces increased risk. This strategic document noted the need to assess, monitor and manage these risks and addressed modernizing aids to navigation and mariner information systems.

- *Arctic Maritime Traffic:* The nature of maritime traffic in the U.S. Arctic is evolving as some operators of cargo vessels and cruise vessels who avoided Arctic waters in the past are now testing the viability of transiting the waters of this new maritime frontier. Currently, most maritime traffic in the U.S. Arctic is affiliated with research, support of oil exploration and production and shipping of goods and materials to remote communities. Over the past 12 years the Marine Exchange of Alaska has built and currently operates an extensive Automatic Identification System (AIS) comprised of over 130 vessel tracking receiver stations in Alaska. This system provides information on maritime activity in the Arctic to the Coast Guard, NOAA, the State of Alaska and other maritime stakeholders to help assess and monitor vessel operations in the Arctic as well as to aid responses to marine casualties. The historical information provided by this system is being used by NOAA to prioritize their hydrographic surveys and charting of Arctic waters. With the benefit of historical maritime traffic routes and updated charts, the Coast Guard was able to establish the first polar vessel routing measures and marine protected areas adopted by IMO in the Bering Strait (the passage between Russia and Alaska). These went into effect early this week, on December 1st, 2018. Similar efforts to provide mariners information on routes that minimize environmental and safety impacts developing from increased maritime activity for the remainder of U.S. Arctic waters encompassing the Chukchi and Beaufort Seas needs to be undertaken.
- *Technological Solutions:* With the location of ice ever changing, the implementation of communications technology capable of providing updated vessel routing measures and information on dynamic marine protected areas has been explored by the Coast Guard R&D Center in partnership with the Marine Exchange of Alaska. The five-year project titled the "Arctic Next Generation Navigational Safety Information System" determined AIS transponders can be used to effectively transmit navigational safety and environmental information to vessels sailing Arctic waters. The traditional navigational safety systems comprised of lighthouses, buoys and shore aids to navigation are not suitable for the Arctic. While physical buoys will be swept away by ice, the R&D project demonstrated AIS is capable of transmitting virtual buoys (aids to navigation) that can be displayed on vessels' navigational systems. The technological solutions identified by the R&D effort provide the most cost-effective solution for addressing the Coast Guard's waterways management mission. These Arctic tailored technological solutions should move from being conceptual to operational.
- *Maritime Domain Management and Response:* The Coast Guard now has the tools and information to monitor maritime activity in the Arctic. This is commonly referred to as Maritime Domain Awareness. We need to move from Maritime Domain Awareness to Maritime Domain *Management* of our Arctic waters. For Western Alaska waters, including the Arctic, the marine industry proposed Alternative Planning Criteria (APC) to address environmental protection and established the non-profit Alaska Maritime Prevention and Response Network to implement elevated risk mitigation and response capabilities prescribed in the APC. Millions of dollars were expended in expanding vessel tracking capabilities for 1.5 million square miles of Alaska waters to aid adherence to routing measures through monitoring and communicating with vessels 24 hours a day and the procurement and staging of additional oil response equipment in the Arctic. Over the last few years Coast Guard policy re APCs has diminished the capabilities and effectiveness of this industry led initiative by redirecting emphasis from prevention to response. I trust the direction to the Coast Guard and the Comptroller General to report on and audit APCs and pollution response in the recent Coast Guard Authorization Bill passed by both the House and Senate should restore the progress APCs have made towards preventing marine casualties and oil spills in the Arctic.
- *U.S. Arctic Port at Nome:* As Arctic maritime operations increase the need to support the logistics needs of U.S. vessels operating in the Arctic will increase beyond the capabilities of our northernmost U.S. port in Nome. Coast Guard

and Navy vessels, research vessels, offshore supply vessels and tugs, small cruise ships and other vessels operating in the Arctic will need to be accommodated to address the increasing maritime activity in the Arctic. Expansion of the Port of Nome is the most viable option. Funding for dredging and outer breakwater construction at Nome will help our Nation take advantage of the opportunities the Arctic presents for our economy as well as help fulfill our responsibility of protecting our Arctic waters from unsafe and environmentally harmful maritime activity.

- *Icebreaking Capacity*: The Coast Guard's Polar Security Cutter initiative is clearly in our Nation's best interests in protecting this emerging maritime frontier. There are few vessels operating in the U.S. Arctic that can respond to mariners in distress and none that can enforce laws and treaties. The opening of Arctic waters to more maritime activity is presenting a substantially greater role for the Coast Guard in the Arctic that needs to be properly resourced.

Thank you, Mr. Chairman for the opportunity to testify before you today. I am willing to answer any questions you may have and pleased to provide additional information to the Subcommittee members and staff at any time.

Senator SULLIVAN. Great, well thank you, Captain Page. And next, we will hear from Ms. Metcalf.

**STATEMENT OF KATHY METCALF, PRESIDENT AND CEO,  
CHAMBER OF SHIPPING OF AMERICA**

Ms. METCALF. Good morning. Chairman Sullivan, Ranking Member Baldwin, thank you for the opportunity to testify on this very important issue. I am Kathy Metcalf, President and CEO of the Chamber of Shipping. We represent members with a U.S. base of operations that operate in both the domestic and international trades and operate both U.S. flag and non-U.S. flag vessels.

Shipping in Arctic waters—and we have all read a number of projections—is expected to increase in volume over the future. That is why we are all here. Four particular maritime transportation needs: one is the offshore support vessels that are expected to increase due to increased offshore exploration; two is the Arctic is a destination transport with ships moving energy, raw materials, and other goods from, between Arctic ports and the rest of the world. You mentioned, Senator Sullivan, trans-Arctic shipping using at least for right now, the Northern Sea Route, potentially in the future, the Northwest Passage. And then the fourth, cruise shipping and tourism. I am not going to bore you with the details of some of the Arctic governance issues, but we do have some concerns. In 1996, the Arctic Council was formed. The work of the Arctic Council is initiated through 6 working groups, 2 of interest here—I mean they are all interesting, but these 2 particular ones—one is the Emergency Prevention for Preparedness and Response Working Group, and the other is the Protection of the Marine Environment Group. Under PAME, 3 initiatives have come to fruition. In 2009, the Arctic Marine Shipping Assessment was agreed. The Arctic Ship Strategic Plan in 2004, and most recently, and of importance to the industry, is the Arctic Shipping Best Practices Form, which is an opportunity for all stakeholders to sit down, share information, and that will be even more important as the volumes increase and as the experiences in the Arctic increase.

We are a founding member of the International Chamber of Shipping, and in my written testimony, are details of seven key principles related to marine transportation and the Arctic. And I would note today, I am addressing that, obviously, as a U.S. ship

owner rep, the U.S. Arctic, but also the Arctic as a whole. Because what happens someplace else may obviously still impact the U.S. Arctic.

Principally, in these fundamentals is the maintenance of a global framework where possible that would regulate Arctic shipping through the International Maritime Organization. It would create a global set of consistent, understandable, and well-known standards that can be implemented across the world shipping fleets. You have mentioned development of the marine infrastructure—full and free market access—there are some concerns as you mentioned President Putin indicated that the Arctic is—he would like to see it become the next Suez Canal. We would not. We would hope that there would be free navigation in accordance with UNCLOS.

Senator SULLIVAN. We fully agree with you on that point.

Ms. METCALF. I thought you would. Now the Polar Code you had mentioned earlier, and I am not going to belabor that point, but of note there, is that there are 2 safety and environmental protection mandatory sets of that, as well as some recommendatory of that story. There is also training, international training that is included in there. But for the last minute, I would like to emphasize the fact that we have several members that operate in the Arctic and have for years. Crowley Maritime Corporation has extensive experience in the Arctic. Starting in the mid-1950s when they serviced the distant Due Line, off the northern coast of Canada. In 1968, Crowley began providing services in the Arctic through its sealifts to Pudeau Bay as well as petroleum transport for the resupply of remote villages. Today their operating areas include the entire Arctic Coast of the U.S. with a storage capacity of more than 75 million gallons. Crowley is one of the unquestionable leaders in the provision of energy resources to the Arctic. They operate seven U.S. flag and ten U.S. flag barges all burning low-sulfur fuels and have a number of other environmental protection systems that have been put in place long before the Polar Code ever required it.

As Senator Baldwin mentioned, it is a critical need to be able to fund the infrastructure, whether it is through public, private, or some combination of, as Ed mentioned, agreements that provide the necessary things. So, enhancement of the U.S. icebreaking capability, both in the Arctic and the Great Lakes, benefits the U.S. economy and the efficiencies of our system. It is critical.

In conclusion, the Arctic is changing, is ever-challenging that Maritime Ministry Global and U.S. stands ready to meet those needs, and I ran across a quote that I hope you'll permit me 2 seconds to read by author William Arthur Ward, "The pessimist complains about the wind. The optimist expects it to change. The realist adjusts the sails." We are ready to adjust our sails.

Thank you, sir.

[The prepared statement of Ms. Metcalf follows:]

KATHY METCALF, PRESIDENT AND CEO, CHAMBER OF SHIPPING OF AMERICA

Good morning, Chairman Sullivan, Ranking Member Baldwin and Members of the Subcommittee. We appreciate the opportunity to provide testimony at this hearing to discuss emerging transportation issues in the changing Arctic region.

Mister Chairman, we respectfully request that our testimony be entered into the record for this hearing.

I am Kathy Metcalf, President and CEO of the Chamber of Shipping of America (CSA). CSA represents member companies which are U.S. based that own, operate or charter both U.S. and non-US flag oceangoing tankers, container ships, and other merchant vessels engaged in both the domestic and international trades. Several of our members conduct operations in the Arctic region including operations based in U.S. waters.

#### **Shipping in Arctic Waters**

Recent observations and projections for the future suggest that thinner ice and longer ice free periods could result in the possibility of increased international shipping activity in the Arctic. There are four main types of operations in the Arctic, all of which are projected to increase in volume in the future:

- (1) offshore support vessel activities supporting offshore exploration activities
- (2) destination transport with ships moving energy, raw materials and goods from and between Arctic ports and the rest of the world
- (3) trans-Arctic shipping using commercially viable intercontinental Arctic sea routes connecting the Atlantic and Pacific Oceans via the Northern (Russian) Sea Route (NSR) and potentially in the future, via the Northwest Passage (Canadian)
- (4) cruise shipping and tourism

Technical developments in ship design, construction and equipment that make operations possible in these remote regions with challenging and unpredictable sea and weather conditions, are stimulating increased interest in Arctic shipping driven for the most part by the increasing demand for shipping services that can support the activities noted above. Increased efficiencies in long range transportation routes can be appreciated by noting that a voyage between Tokyo, Japan and Hamburg, Germany via the Suez Canal is approximately 14,000 nautical miles with a duration of approximately 50 days, while the same voyage transiting the Northern Sea Route would be approximately 8000 nautical miles with a duration of approximately 35 days resulting in more fuel and time efficient transport of cargoes with a resulting reduction in air emissions due to the significant reduction in transit miles.

In view of the anticipated increases in shipping services in the Arctic, there is a growing awareness within the international community about the impact of these increased activities on the sensitivity of Arctic ecosystems and the need for a high degree of care by vessels operating in and through the Arctic. The global shipping industry fully acknowledges these concerns and is totally committed to the protection of the Arctic marine environment, the prevention of pollution and the safe operation of vessels in this area.

#### **Arctic Governance Issues**

In 1996, the Arctic Council was formed to promote cooperation, coordination and interaction among the Arctic States, Arctic indigenous communities and other stakeholders with a focus on sustainable development and environmental protection. The Ottawa Declaration established membership in the Arctic Council to include Canada, Denmark, Finland, Iceland, Norway, the Russian Federation, Sweden and the United States. In addition, six organizations representing Arctic indigenous peoples have status as Permanent Participants and an observer status exists which is open to non-Arctic states and other entities that the Council determines can contribute to its work.

The work of the Arctic Council is conducted through six working groups which are the Arctic Contaminants Action Program (ACAP), Arctic Monitoring and Assessment Programme (AMAP), Conservation of Arctic Flora and Fauna (CAFF), Emergency Prevention, Preparedness and Response (EPPR), Protection of the Marine Environment (PAME), and Sustainable Development Working Group ((SDWG). While all carry out vital projects, EPPR and PAME are the two principle working groups relative to Arctic shipping issues. In 2002, the Council requested PAME to develop a strategic plan for the protection of the Arctic marine environment which was approved as "The Arctic Strategic Plan (AMSP)" in 2004 with four strategic goals including reduction and prevention of pollution, conservation of Arctic marine diversity and ecosystem functions, promotion of the health and prosperity of all Arctic inhabitants and the advancement of sustainable Arctic marine resource use. PAME was also charged with developing the Arctic Marine Shipping Assessment which was agreed by the Council in 2009 and is the subject of periodic status reports with the most recent published in May 2017.

Most recently under the leadership of PAME, the Arctic Shipping Best Practices Information Forum was created to raise awareness of the provisions of the IMO Polar Code and to facilitate the exchange of information and best practices among

the forum participants. In addition a number of Arctic Shipping Forums/Conferences have been convened or are planned to facilitate discussions among all stakeholders on critical issues and promote the sharing of information which include governance issues as well as operational issues.

**Principles with Respect to the Regulation of Ships and the Governance of Maritime Activity in the Arctic**

The international shipping industry through the International Chamber of Shipping (ICS) and its member national associations, of which CSA is a founding member, has identified 7 key principles related to maritime activities in the Arctic:

- (1) Maintenance of a global framework regulating Arctic shipping under the auspices of the International Maritime Organization (IMO), to ensure the creation and implementation of comprehensive and consistent requirements for safety and environmental protection.
- (2) Development of Arctic maritime infrastructure to support safety and environmental protection including programs to address aids to navigation, nautical charts, satellite communications, bunkering facilities, port reception facilities for ship's waste, pilotage in shallow passage areas, ice-breaking capabilities, search and rescue infrastructure and the provisions of "places of refuge".
- (3) Full participation of shipping nations in the decision making processes associated with the development of Arctic shipping requirements and programs. The rights of the nations which compose the Arctic Council are acknowledged however these rights should always be exercised in a manner that remains consistent with the UN Convention on the Law of the Sea (UNCLOS) and existing IMO conventions, including the recently implemented Polar Code which amended the International Convention for the Safety of Life at Sea (SOLAS) and the International Convention for the Prevention of Pollution from Ships (MARPOL).
- (4) Full and free market access and freedom of navigation. Unilateral, national or regional regulations governing ship safety, environmental protection or other shipping matters should be avoided and must not disadvantage ships registered in non-Arctic nations. The UNCLOS regime of transit passage for straits used for international navigation should be given full force and effect. Likewise, regulations governing market access should be consistent with commitments made by governments at the World Trade Organization (WTO).
- (5) Need for legal clarity about the status of the Arctic. Outstanding questions about the legal status of Arctic waters need to be clarified at the United Nations level. In general, in all waters (other than "internal waters"), the right of innocent passage within the Exclusive Economic Zone (EEZ) enshrined in UNCLOS should always apply. Further clarification is needed as to the definition of "internal waters" as well as the relationship between coastal states' rights and the principles of innocent passage and transit passage enshrined in UNCLOS. International shipping needs clarity with respect to which nations or organizations are responsible for ensuring the safety and environmentally responsible operations of ships operating in Arctic waters.
- (6) Transparency of national regulations. Although the shipping industry promotes the concept of globally consistent regulations for Arctic shipping consistent with UNCLOS and IMO conventions, if national requirements are to be put in place they should be clear, understandable and accessible to the shipping industry to ensure successful compliance.
- (7) Reducing bureaucracy and setting appropriate fees for services. Consistent with coastal nations' rights and obligations under UNCLOS, the development of Arctic shipping and the services necessary to assure safe and environmentally responsible operations should be fair, transparent and avoid the creation of monopolistic practices where it is determined that fees should be assessed on users. These processes should reconcile the need for both environmental and economic sustainability and will require the provision of maritime services that are competitive and cost efficient.

**The IMO International Code of Safety for Ships Operating in Polar Waters (The Polar Code)**

The Polar Code and related amendments to SOLAS and MARPOL, which entered into force on 1 January 2017, is intended to cover the full range of shipping related issues relevant to navigation in waters surrounding both the North and South poles including ship design, construction and equipment, operational and training concerns, search and rescue, and protection of the unique environment and eco-systems

of the polar regions. The Polar Code includes mandatory measures covering safety (part I–A) and pollution prevention (Part II–A) and recommendatory provisions for both safety and pollution prevention (parts I–B and II–B, respectively). The chapters in the Polar Code set out goals and functional requirements including issues related to ship structure, stability and subdivision, watertight and weathertight integrity, machinery installations, operational safety, fire safety/protection, life-saving appliances and arrangements, safety of navigation, communications, voyage planning, manning and training, prevention of oil and noxious liquid substance pollution, prevention of pollution by sewage, and prevention of pollution by discharge of garbage. The Polar Code also includes new manning and training requirements which are now mandatory under the Standards of Training, Certification and Watchkeeping (STCW) Convention and Code effective 1 July 2018 and include requirements for basic training (Master, Chief Mate and officers in charge of a navigational watch) and advanced training (Master, Chief Mate).

The Polar Code applies to vessels which operate in polar waters and are required to be certified in accordance with the SOLAS Convention (Part I safety and manning/training requirements) and/or the MARPOL Convention (Part II). For non-SOLAS vessels required to hold a MARPOL certification, only the provisions of Part II apply. New ships built on or after 1 January 2017 must be compliant with the safety provisions at the time of delivery while existing ships (built before 1 January 2017) must comply with the safety provisions by their first intermediate or renewal survey after 1 January 2018. As noted above the manning and training requirements apply to new and existing ships on 1 July 2018. The environmental protection requirements are applicable to both new and existing vessels on/after 1 January 2017. Compliance with the Polar Code is documented through the issuance of a Polar Ship Certificate and requires the preparation of a ship-specific Polar Operations Manual.

#### **US Flag Operations in the Arctic**

As noted in my opening comments, CSA has several members that operate in Arctic waters. For example, Crowley Maritime Corporation has extensive experience in ice management and vessel operations in the Arctic, supporting commercial and government services and goals. Starting in the mid-1950s with the first operations in the Arctic by commercial tug and barge service, Crowley began supplying the Distant Early Warning (DEW) Line radar installations for the U.S. Air Force in the Aleutians and across the northern coast of Canada. In 1968, Crowley began providing services in the Arctic through its sealifts into Prudhoe Bay as well as petroleum transportation for the re-supply of remote villages, other commercial entities and government facilities. Today, Crowley's operating areas include the entire Arctic coast of the US, including sounds, bays and rivers and most recently has expanded to serve the Canadian Arctic. Crowley has also successfully managed projects in Prudhoe Bay, Sakhalin, Coronation Gulf of Canada and the Barents Sea. With a storage capacity of more than 75 million gallons, Crowley is one of the unquestionable leaders in the Alaska fuel industry providing transportation, distribution and sales of petroleum products to more than 280 communities across the state, including many in the Alaskan Arctic. Crowley also supports the energy industry on the North Slope with summer tug-and-barge sealifts of large production modules and other essential marine transportation services.

As indicated by the examples above, Crowley offers a full range of services including project management, heavy lift barge transportation, ocean towing, engineering, liquefied natural gas (LNG) services, naval architecture, vessel design and construction management, project concept studies and emergency response services.

Crowley operates seven U.S. flag tugs and ten U.S. flag barges that provide seasonal deliveries to the region that are paramount to the viability and quality of life for the indigenous populations living in the remote villages of the Alaskan Arctic. These vessels utilize ultra-low sulfur diesel fuel and typically stop in Port Clarence to change from deep sea towing gear to shallow draft towing gear to avoid impacting the Arctic sea bottom. Crowley also utilizes shallow draft assist vessels to manage barge operations in the shallow waters of the region to further minimize its operational footprint in the Arctic. Safe and environmentally responsible operation is the fundamental basis of Crowley's operating philosophy and is reflected in its vessel design, maintenance and crew training requirements, use of ice monitoring to determine safe navigational routes and avoid wind driven ice which can entrap equipment, and its collaboration with the U.S. Fish and Wildlife Service to minimize the impact of its operations on identified endangered species which includes the use of marine observers and adherence to marine mammal avoidance areas.

### **Infrastructure Funding**

As noted above, safe and environmentally responsible operations require that attention be paid to infrastructure needs including development and/or enhancement of navigation and communication systems, aids to navigation, search and rescue capability, land-based systems to enable bunkering and waste disposal, emergency response needs and icebreaking capability. While all require funding likely from a combination of public and private sources, in particular, I would bring your attention to the current status of the U.S. Coast Guard's icebreaking capability and the urgent need for additional funding to meet the needs of both the U.S. Arctic waters as well as the Great Lakes. Enhancement of the U.S. icebreaking capability will benefit the U.S. economy and the efficiencies of the marine transportation system by maximizing the operational seasons in both the Arctic and Great Lakes. The industry fully supports and is appreciative of provisions contained in the recently passed U.S. Coast Guard Authorization Act of 2018 addressing these critical resources.

### **Conclusion**

There is no doubt that the changing and ever challenging landscape of the Arctic and Arctic shipping requires a realistic and pragmatic assessment of the maritime transportation needs at a global level and at the U.S. level relative to transportation needs in the U.S. Arctic. The shipping industry will meet that challenge in a safe, environmentally responsible and efficient manner taking into account a quote from educator and author William Arthur Ward who commented that "The pessimist complains about the wind; the optimist expects it to change; the realist adjusts the sails".

Thank you for the opportunity to testify at this hearing. We would be happy to answer any questions.

Senator SULLIVAN. Great. Thank you, Ms. Metcalf.  
Mr. Goodwin.

### **STATEMENT OF WILLIE GOODWIN, CHAIRMAN, ARCTIC WATERWAYS SAFETY COMMITTEE**

Mr. GOODWIN. Good morning. Good morning my name is Willie Goodwin, and I am from Kotzebue, Alaska and serve as Chairman of the Arctic Waterways Safety Committee. In northern Alaska, we depend heavily on the ocean for our food resources. In some of our communities, 90 percent of the food supply comes from the ocean. We all depend on our coastal waters for local transportation. As our sea ice melts, we are seeing dramatic increases in other maritime traffic, including marine research, tourism, international transit, and fisheries entanglements. In 2017, 24 different research cruisers were planked in our waters for a three-month period. In 2016, Crystal Cruise Lines brought 1,700 people to the Arctic on the *Crystal Serenity*. We see smaller vessels, commercial and private cruise traffic on a regular basis. Sometimes vessels anchor offshore and just start pouring passengers into our communities.

Changes are coming fast, and they are creating very real risks. The Arctic Ocean is a dangerous place where at any time we still have sea ice. Wind, weather, and sea state can change without warning. We regularly have storms from a—with hurricane force-winds. One of our communities, Beryl, lost two experienced hunters this fall due to rough seas. Adding large ocean-going vessels to these waters where we have people already risking their lives to feed their families can be a prescription for disaster. Alaska is a big state with a lot of area for the Coast Guard to cover. The nearest Coast Guard station, which is located in Dutch Harbor, is 700 miles from Nome and 1,200 miles from Point Barrow. That is greater than the distance from here to Omaha, Nebraska, and we are talking travel by boat.

Through 2015, we had radio towers with ship-to-shore capabilities from St. Lawrence Island to the Canadian border. This system was privately funded by oil and gas operators, but everyone used it. Oil and gas use it. Tug and barge use it. Transiting vessels use it. Coast Guard use it. Our marine mammal hunters depended on it as their lifeline to shore. When Shell pulled out in 2015, all that disappeared. Thanks to Captain Page and his team at the Alaska Marine Exchange, we have AIS covered for most of our waterway. We can track vessels, but we have no way of reaching them. We cannot warn them if they are entering waters where we have hunters or other residents in small craft, and we cannot communicate with them if they are in distress. I cannot stress enough, the risk of life caused by our lack of communication infrastructure and other safety measures, but in Alaska, we do not just sit and watch, we act and we get things done.

In 2014, working with Coast Guard District 17, our hunter groups, local and regional Governments and tribes, marine pilots, and commercial and industrial users got together and stood up. The Arctic Waterways Safety Committee, our harbor safety committee for the Arctic. We have initiated a waterway safety plan, worked with the Coast Guard, NOAA and our Alaska—and our Alaska delegation to push up the schedule for bathymetric surveys through the Bering Strait and along our coast. Contributing to the Port Access Route Study for the Bering Strait region and started gathering information for the Chukchi Beaufort Sea PARS. The Coast Guard, NOAA, NSF and BOEM all participated in our Arctic Waterways Safety Committee meetings. This organization—we got this organization off the ground with private foundation funding, but our Federal Government is getting huge benefit from our work. So our academic researchers and commercial and industrial vessels operators, but our private foundation money is gone.

Senators, here is the bottom line. The Arctic is no longer opening. It is open, and here is what we have: hundreds of local citizens transiting and hunting in our coastal waters in small craft, increasing numbers of large ocean-going vessels transiting the same water, an AIS system, a harbor safety committee dedicated to maritime safety. But here is what we do not have: communication infrastructure, a consistent Coast Guard presence, modern ocean floor mapping, disaster response infrastructure and resources, resources to continue our work on maritime safety measures. We need resources, and we need infrastructure. If you remember nothing else from my testimony today, please remember this, the Arctic is home to coastal maritime communities working underwater in small craft. The Arctic also is a frontier where thousands of people are now traveling in large vessels in poorly chartered waters. Our Federal Government can work with us to support the approach we are taking—putting safety measures and infrastructure in place before the unthinkable happens, or our Federal Government can take responsibility for addressing human disaster in one of the harshest environments on Earth without infrastructure or even communication capabilities. I encourage you to choose the first option.

Thank you for your time.

[The prepared statement of Mr. Goodwin follows:]

PREPARED STATEMENT OF WILLIE GOODWIN, CHAIRMAN,  
ARCTIC WATERWAYS SAFETY COMMITTEE

Good morning, my name is Willie Goodwin. I'm from Kotzebue, Alaska, and serve as the Chairman of the Arctic Waterways Safety Committee.

Thank you for giving me a few minutes to speak with you. I am here today to talk about the marine traffic we are seeing in our northern Alaskan coastal waters, the concerns this traffic is creating, the solutions we are developing, and the engagement we need from our Federal government to continue the work to create a safe environment for the arctic maritime.

*The Arctic Marine Environment Is Changing Rapidly.* Our coastal communities in northern Alaska depend very heavily on the ocean for our food resources. In some of our communities, 90 percent of the food supply is taken from the ocean. In our remote villages, we don't have access to grocery stores like you do here, so these resources are critical to our food security.

They are the backbone of the subsistence culture of Native communities throughout Alaska. Our principal marine resources are the five main arctic marine mammals: the bowhead whale, beluga whale, walrus, ice seals, and polar bear.

Our people have relied on these marine mammals for thousands of years. They are so important to us that we created five tribally-authorized hunter groups to speak for us on issues affecting our five marine mammals. As hunters, we have managed our resource use for thousands of years, but when the Marine Mammal Protection Act was passed, we were forced to create formal organizations and get tribal recognition so that we could convince the Federal government to pay attention to us and to work with us. I recently retired from my long-time position as Chairman of Alaska Beluga Whale Committee.

We also depend on our coastal waters for local transportation. We don't have a Metro system like you have here in Washington, D.C. We don't have Uber. There are no roads connecting our communities. So if we want to travel between villages, we either take a snow machine across the ice in winter or one of our small outboard skiffs along the coast in summer.

This is the way things have been for us for thousands of years, with snow machines replacing dog teams and outboards replacing canoes. But now the Arctic is different. While the rest of the globe is just beginning to wake up to the reality of climate change, we have been watching its effects transform the Arctic right before our eyes for the past 25 years. And the rate of change increasing every year. The Bering Strait is now ice free year-round and fall 2017 was the latest freeze-up on record for the Bering, Chukchi, and Beaufort Seas. On Monday it was 24 degrees in Barrow. Not too long ago, that would have been a summer temperature!

I am not here to talk with you about these climate facts, but I hope that you are holding hearings to inform yourselves.

*Arctic Maritime Traffic Is Increasing.* The changing climate is bringing a lot of other changes our way, including increasing marine vessel traffic. Up north, we have been working with offshore oil and gas operators since the 1980s, to address impacts of their activities on our waters, our resources, and our hunters. That has been a pretty successful collaboration so far, but now we are also faced with other vessel activity, including marine research, tourism, international transit, and fisheries entanglements.

In 2017, we were notified of 24 different research cruises planned for our waters in a three-month period. In 2016, Crystal Cruise Lines brought 1,700 people to the Arctic on the Crystal Serenity for a cruise up the coast of Alaska and through the Northwest Passage. We see smaller commercial and private cruise traffic on a regular basis. It is not unusual for vessels to anchor offshore and discharge foreign passengers into our communities. We see vessels that we can't identify hauling unknown cargo through our coastal waters.

These changes are coming faster than we can keep up with them. And they are creating very real risks for our people and for the many people now out on these very dangerous waters. One of our communities, Barrow, lost two very experienced hunters this fall, due to rough seas.

*The Arctic Waterways Safety Committee Has oversight of the Waters From the Northern Bering Sea To the Canadian Border.* As I'm sure you know, the U.S. Coast Guard recognizes Harbor Safety Committees, comprising local marine interests in the various ports and harbors of the coastal U.S. In October 2014, a number of marine interests in northern Alaska worked with Coast Guard District 17 to stand up a Harbor Safety Committee for U.S. waters from the northern Bering Sea to Canada. Since we don't have harbors in northern Alaska, we refer to this committee as the Arctic Waterways Safety Committee, or AWSC.

The AWSC is the largest Harbor Safety Committee in the United States, by area. And it is the only Harbor Safety Committee that includes subsistence hunters. This is because, in Alaska, the greatest number of marine users are subsistence hunters, working from small skiffs to gather marine food resources for their communities.

In other areas of the country, hunting tends to be more of a recreational activity. In the Arctic, hunting sustains life. So, where we come from, when someone tells you they're a hunter, it means that's somebody who gets things done. In this case, our marine mammal hunters took the initiative, with the Coast Guard's guidance, to identify the key marine interests and bring them together.

The AWSC is a 15-member committee, including one seat for a representative from each of our five marine mammal hunter groups, as well as the North Slope Borough, the Northwest Arctic Borough, the City of Nome, the Alaska Marine Pilots Association, Marine Research (vessel operators and research funders), Cruise Tourism, Tug and Barge Operators, Oil and Gas/Mining, Fishing, and Regional Tribal Entities.

In the short time we've been together, we have begun to work closely with the Coast Guard, NOAA, and our Alaska Delegation to Congress to advocate for bathymetric surveys through the Bering Strait and along our coastal areas. We engaged with District 17 in their work on the Port Access Route Study for the Bering Strait Region and will engage in the Chukchi Sea/Beaufort Sea PARS. We are engaged with NOAA and Coast Guard District 17, providing updates and additions to the Coast Pilot and Notice to Mariners, with seasonal notifications of subsistence hunting times and areas.

We are in the process of drafting the Waterways Safety Plan for our region of coverage. To create this Plan, we already have well-established guidelines for offshore oil and gas activities, taken from the Alaska Eskimo Whaling Commission's Open Water Season Conflict Avoidance Agreement with offshore operators. We also have guidelines from the NANA Region's work with Red Dog Mine. We are using the Puget Sound Waterways Safety Plan as a guide and consulting with District 17 whenever possible.

Because of the substantial amount of marine research traffic, especially Federal traffic, we are seeing close to our shores, we are working very closely with NOAA, NSF, BOEM, Coast Guard, and the University of Alaska, Fairbanks to develop marine research protocols. Our goal is to promote vessel safety and to help reduce interference with our hunters.

Another initial area of focus is tug-and-barge operations. The tug-and-barge guidelines are being put together in cooperation with Crowley Maritime, one of the principal tug-and-barge operators in our region.

*Continuing to Build a Safe Maritime Environment in Alaska's Arctic Will Take Investment.* The AWSC has become the primary forum for arctic waterways-users to gather, exchange information, and coordinate their operations with each other and with our hunters. Our Federal agencies, including Coast Guard are enthusiastic about this public forum and they are certainly making use of it. Academic researchers and commercial and industrial vessel operators express their gratitude for the opportunity to participate in this collaborative venue. Working together, we are making a difference on the water. The opportunity to meet, exchange ideas, and raise concerns is giving us the ability to increase safety for everyone using our coastal waters.

We need to keep this work going. Our success so far is small compared to the challenges we face. But it is significant. Collaboration is the Alaska way. And we are demonstrating the value of collaboration for establishing a safe and prosperous Arctic maritime. We are identifying needs and finding consensus on solutions that are effective and meaningful for all involved.

Our only choice is to keep this work going! But we don't have dedicated resources to support the work. As I said before, as hunters we get things done. We have brought in foundation funding to get this effort up and running. We are volunteering our time. We are giving this everything we have, for the sake of safety on our waters.

I hear about a lot of meetings that different groups are having across the Arctic. And I travel to some of them. A lot of people are talking about a lot of things and making a lot of plans. The Arctic Waterways Safety Committee is the only group that is actually making a difference on the water.

*The Need for Coastal Communications Infrastructure in Northern Alaska Is Urgent.* Thanks to Mr. Ed Page and his team at the Alaska Marine Exchange, we have AIS coverage for most of our waterway, which means we can track vessels through the AIS system. But we have no way of reaching them. This means that we can't warn them if they are entering waters where we have hunters or other local residents in small craft. We also can't communicate with them if they are in distress.

I cannot stress enough the risk to life caused by our lack of communications infrastructure. It leaves our local residents vulnerable to interactions with large vessels. Alaska is a big state with a lot of area for the Coast Guard to cover. The nearest Coast Guard station, which is located at Dutch Harbor is 700 miles from Nome and 1,200 miles from Pt. Barrow. That's greater than the distance from here to Omaha, Nebraska. And we're talking travel by boat. If there were an emergency in our northern waters, our local hunters might be the only responders on-sight for days.

Through 2015, we had an elaborate system of radio towers with ship-to-shore capabilities using VHF and satellite phone. Every village from St. Lawrence Island to the Canadian border had a radio tower staffed by individuals who coordinated the movements of large vessels with the activities of our small subsistence hunting boats. This system started with one radio tower at Dead Horse, put up in 1985, and grew and expanded over the course of 30 years. Oil and gas used this system. Tug-and-barge used it. Transiting vessels used it. Coast Guard used it.

Our marine mammal hunters depended on it as their lifeline to shore. The Arctic Ocean is a dangerous place at any time. Our northern areas still experience sea ice. Wind, weather, and sea-state can change without warning. We regularly experience storms with hurricane-force winds. Adding large ocean-going vessels to these waters, where we have people already risking their lives to feed their families, can be a prescription for disaster. The risk is multiplied by our lack of sound, reliable communications and traffic management.

I repeat. On any given day, we have hundreds of people on the water in small craft, working and risking their lives to feed our communities. We have unknown numbers of ocean-going vessels transiting our waters. We have no way to communicate.

We have reached out to the Coast Guard. We have reached out to the White House. We have reached out to the Committee on Marine Transportation Systems. We have looked for ways to attract private investors. We have briefed members of Congress.

The Arctic is no longer opening. It is open. Our residents are subsistence hunters. We are hard-working people who get things done. We feed our communities and look for responsible ways to share our resources. But we aren't going to get much further protecting our coastal waters,—or the resources that are vital to our survival, or our hunters and residents, or the people transiting along our coast—without resources and engagement from our Federal Government.

To summarize for you, here is the situation today. What we have as the Arctic opens and what we need.

*This is what we have:*

- We have hundreds of citizens transiting and hunting in our coastal waters in small craft.
- We have increases in the numbers of large ocean-going vessels coming through those same waters, largely unaware of our hunters' presence.
- We have a public forum, the AWSC, where local, federal, and international marine interests are working together to develop consensus measures for arctic transit and maritime safety.

*This is what we need for maritime safety:*

- We need a consistent Coast Guard presence in our waters.
- We need infrastructure for ship-to-shore communications with the vessels that are transiting our waters.
- We need infrastructure and other resources to support disaster response.
- We need modern ocean floor mapping for the vast majority of our waters.
- We need a way to ensure that mariners are aware of the traffic management measures so far agreed to under our Waterways Safety Plan.<sup>1</sup>

And that is the short list.

If you remember nothing else from my testimony today. Please remember this. The Arctic is home to coastal maritime communities working on the water in small craft. The Arctic also is a frontier where thousands of people are now traveling in large vessels in poorly charted waters. Without communications infrastructure. Without traffic safety measures. Without disaster response infrastructure or even protocols. And with very limited Coast Guard coverage. Our Federal government can work with us to support the approach we are taking, putting safety measures and

<sup>1</sup>The AWSC isn't even listed on the U.S. Coast Guard's Port Directory link on its Homepage website.

infrastructure in place before the unthinkable happens. Or our Federal government can take responsibility for addressing human disaster in one of the harshest environments on earth, without infrastructure or even communications capabilities.

I encourage you to choose the first option.

Thank you for your time.

Senator SULLIVAN. Thank you, Mr. Goodwin for that outstanding testimony. I particularly appreciate the focus on the actions that you have already taken, which are very commendable and these issues that I think a lot of people do not recognize, for example, the lack of communications opportunities and capability, which most Americans take for granted.

Mr. Hartsig, five minutes for your testimony, sir.

**STATEMENT OF ANDREW HARTSIG, ARCTIC PROGRAM  
DIRECTOR, OCEAN CONSERVANCY**

Mr. HARTSIG. Thank you. Good morning, Chairman Sullivan, Ranking Member Baldwin and members of the Subcommittee. My name is Andrew Hartsig. I live and work in Anchorage, Alaska, where I am the Arctic Program Director for Ocean Conservancy.

Ocean Conservancy is a nonprofit marine conservation organization. Our program engages at local, State, national and international levels to address a range of conservation challenges, including increasing vessel traffic in the Arctic. People argue about a lot of things in the Arctic, but there is widespread agreement that vessel traffic will continue to increase and that we are not adequately prepared for it. Fortunately, we can act now to prevent future shipping accidents and to bolster our preparedness and response capacity.

The Arctic is warming twice as fast as the rest of the world, and that is reducing the extent, thickness, and duration of seasonal ice cover. Vessel traffic in the Arctic has already grown significantly, and it is poised to increase even more rapidly as the ice-free season continues to lengthen.

A new ocean is opening up to ship traffic, and it is an awe-inspiring place. Our Arctic coasts are home to indigenous peoples whose ways of life, cultures, and economies are inextricably linked to the ocean. Arctic waters support an astounding abundance of sea birds, fish and marine mammals. Each spring, the Bering Strait hosts one of the biggest marine mammal migrations in the world. And at the same time, the Arctic is remote and challenging. Infrastructure is limited, coastal communities are not connected to the road system. There are no deep-water ports north of Dutch Harbor. Arctic waters are subject to seasonal sea ice and severe weather, and in many cases, we do not know exactly what is out there. Less than 2 percent of the Arctic has been charted to modern standards. So given these conditions, increasing vessel traffic adds substantial risk. Alaskans have experienced major oil spills, and we understand what is at stake when risks become reality. Now is the time to put in place Arctic-appropriate measures that will increase safety and protect the marine environment, even as vessel traffic continues to grow.

As Captain Page said, prevention of accidents should be our highest priority. That is true in the Atlantic, the Pacific, and the Great Lakes, and it is imperative in the remote waters of the Arctic

where harsh conditions can prevent response efforts for days on end. We also need to bolster our preparedness and response capacity. Here are just four things we can do: We can put in place additional vessel routing measures like traffic lanes and guard rails on highway, routing measures can help ensure that vessels travel along predictable routes that are free of navigational hazards. The Coast Guard has already worked with the International Maritime Organization to designate routing measures in the Aleutians and the Northern Bering Sea and Bering Strait. Now, they are considering a similar process for the Chukchi and Beaufort Seas. Ocean conservancy strongly supports this work. Done right, it will increase shipping safety, reduce conflicts with subsistence users and safeguard sensitive marine environments. We can also improve Coast Guard implementation of alternative planning criteria or APCs. Given the Arctic's vast distances and lack of infrastructure, vessels operating there cannot meet standard requirements for oil spill response plans. APCs allow vessel operators to come up with alternative ways to reach an equivalent level of preparedness. Unfortunately, APCs have not been implemented consistently, which means that some vessels operated with contracts that do not guarantee access to the greatest amount of in-region, oil spill response equipment, and that situation should be addressed. We can also do a better job preparing residents of Arctic coastal communities to respond to shipping accidents. Arctic residents will likely be first responders in the event of an accident, and they will certainly be the most directly affected by impacts from spills. Allocating more resources toward regionally appropriate spill response equipment and training would greatly increase community preparedness.

The last thing I will mention is the need for continued support for ice breakers. They are important in any region that experiences seasonal ice, including the Great Lakes, and in the Arctic, they are critical. Congress should continue to support construction of new ice breakers, which will help the Coast Guard better meet its national security, search and rescue, environmental protection, and other vital missions 365 days a year.

The management decisions we make today will affect the Arctic for years to come. If we focus on targeted prevention measures and continued build out of response capacity, we can ensure safety and environmental protection measures keep pace with the rapidly changing shipping sector.

Thank you again for the opportunity to be here today. I appreciate your time, and I look forward to the Subcommittee's questions.

[The prepared statement of Mr. Hartsig follows:]

PREPARED STATEMENT OF ANDREW HARTSIG, ARCTIC PROGRAM DIRECTOR,  
OCEAN CONSERVANCY

### **I. Introduction**

Good morning Chairman Sullivan, Ranking Member Baldwin, and Members of the Subcommittee. My name is Andrew Hartsig and I am the Arctic Program Director at Ocean Conservancy. Thank you for the opportunity to testify today about emerging marine transportation issues in the changing Arctic region and opportunities to promote safe shipping practices that accommodate increasing vessel traffic and safeguard Arctic communities and the marine environment.

Ocean Conservancy is a nonprofit marine conservation organization that works across sectors to address systemic challenges and find lasting solutions. Our Arctic program—which includes Alaska-based staff located in Anchorage, Eagle River and Juneau—focuses on preserving the resilience of Arctic and sub-Arctic marine ecosystems. We engage at local, state, national and international levels to address conservation challenges related to commercial fishing, offshore oil and gas operations, marine debris, climate change and vessel traffic, among others.

As an Alaska resident who has worked on marine issues in the Arctic for the past ten years, I have seen how rapidly the region is changing. The Arctic is experiencing some of the fastest warming on the planet—twice as fast as the rest of the world. Warming temperatures are melting permafrost and glaciers, disrupting marine ecosystems, and reducing the extent, thickness, and duration of seasonal sea ice cover. These changes, in turn, are having profound impacts on maritime transportation in the Arctic. Vessel traffic in the Arctic has already grown significantly, and is poised to increase rapidly in coming years as the ice-free season lengthens. As vessel traffic increases, so too does the potential for significant impacts to residents of the region and to the marine ecosystem.

Fortunately, we have a window of opportunity to put in place Arctic-appropriate measures and best practices that will increase safety and protect communities and the marine environment. First and foremost, we can take common-sense steps to prevent maritime accidents from happening in the first place. These steps include implementing targeted vessel routing measures, moving toward a more effective approach to Alternative Planning Criteria, tightening limitations on discharges into the water, supporting advancements in vessel tracking and communication, and improving nautical charts. Second, we can improve our ability to respond effectively if an accident does occur by increasing spill response equipment and training in local communities, continuing to fund design and construction of new ice-breaking polar security cutters and supporting seasonal Arctic Shield operations and additional Coast Guard outreach activities in Arctic communities.

## II. A Changing Arctic and Risks from Vessel Traffic

U.S. Arctic waters include an enormous area that stretches from the Aleutian Islands to the Beaufort Sea. These waters are remarkably productive and have great biological and cultural significance. The U.S. Arctic coast is home to the Aleut, Unangan, Yup'ik, Cup'ik, St. Lawrence Island Yup'ik, and Inupiaq peoples whose way of life, cultures and economies are inextricably linked to the marine ecosystem. Ocean Conservancy does not speak for these indigenous people, who have relied on these productive waters for hundreds of thousands of years, but we strongly believe that any discussion of the Arctic Ocean must prioritize their views.

The Arctic marine environment itself is diverse. The ocean around the Aleutian Islands remains ice-free all year long, but from St. Lawrence Island north, sea ice normally covers the ocean's surface for months at a time. These icy waters turn into a rich feeding ground each spring, when they host one of the largest marine mammal migrations on the planet. As sea ice melts, thousands of whales, hundreds of thousands of walrus and ice seals and millions of birds pass through the Bering Strait to feed, breed and give birth. To the south, waters of the southern Bering Sea and Aleutian Islands support the Nation's richest and most productive commercial fisheries, as well as globally significant seabird colonies. The Pribilof Islands are breeding grounds for more than 50 percent of the world's population of northern fur seals.

This region is changing rapidly, putting these vibrant ocean ecosystems at risk. Human-caused climate change is reducing sea ice cover, causing villages to erode into the ocean, making subsistence hunting more difficult and dangerous and disrupting food chains. It is also facilitating other industrial activities—like oil and gas exploration and development and commercial fishing—in addition to increasing vessel traffic. While this hearing focuses on marine transportation, it is important to keep in mind this broader view as we consider how to manage vessel traffic in the region.

At present, the bulk of ship traffic through the Arctic region occurs on the Great Circle Route, which connects the west coast of North America to East Asia and passes near or through the Aleutian Islands. Further north, ships, tugs and barges play a vital role delivering fuel and other goods and materials to Arctic communities and industrial endeavors, such as Red Dog mine and North Slope oil and gas projects. The Department of the Interior has also proposed future oil and gas lease sales in U.S. Arctic waters. If those lease sales come to pass, exploration and development would add significant vessel traffic in the region.

In addition, Arctic transit routes between East Asia and Western Europe are emerging—at least for certain sectors of the shipping industry—as viable alter-

natives to traditional routes that run through the Suez or Panama canals. The Arctic Ocean itself is projected to experience ice-free summers by mid to late century, which could create a new trans-polar route over the top of the globe. All of these Arctic transit routes pass through the Bering Strait. According to a 2016 Coast Guard study, Bering Strait transits increased from 220 in 2008 to 540 in 2015. Marine-based tourism is also increasing in the Arctic. Cruise companies are investing heavily in purpose-built expedition cruise ships for Arctic voyages, with nearly 30 new vessels expected to launch by 2022.

### III. Toward Safer Arctic Shipping

Increased vessel traffic in the Arctic—whether from tourism, transit traffic or destination shipping—puts the region at increased risk. An accident in the remote Arctic could easily turn into a nightmare scenario for search and rescue agencies, especially if it involved a passenger ship. An accident could also cause an oil spill, including a major spill like the 2004 *Selendang Ayu* disaster that released roughly 350,000 gallons of oil and diesel into Aleutian Island waters. Vessel traffic can also result in strikes on marine mammals, introduction of invasive species from ballast water or hull fouling, discharge of greywater and sewage into the water, emission of pollutants into the air, increases in subsea noise and potential conflicts with subsistence users.

With ship traffic in the U.S. Arctic poised to grow rapidly, it is time to implement regionally-appropriate management measures and best practices that are designed to increase safety and reduce the risk of harm to communities and the Arctic environment.

#### A. *Prevention is the first line of defense*

Prevention should be the first line of defense in icy Arctic waters—as well as other cold-water regions such as the Great Lakes. The Arctic is subject to seasonal darkness, severe weather and strong ocean currents. It is extremely remote and has minimal infrastructure. When vessels have accidents in these remote waters, search and rescue efforts are a serious challenge. Cleaning up a significant oil spill is extraordinarily difficult and only marginally effective. In many instances, stormy sea conditions and poor weather may preclude response efforts for extended periods of time, further reducing effectiveness. When 3,000 gallons of persistent oil spilled into the waters off Shuyak Island this spring, it took three days to get response vessels on-scene due to poor weather—and that spill was less than 50 miles from the Coast Guard station on Kodiak.

No single silver bullet will prevent all shipping accidents and impacts, but a suite of regionally appropriate mitigation measures and best practices can go a long way. These measures and practices include targeted vessel routing measures, a consistent and effective approach to Alternative Planning Criteria, limitations on discharge, innovations in vessel tracking and communication, and improved charting.

#### *Routing Measures*

Vessel routing measures can be used to help prevent accidents in the maritime Arctic. Routing measures include various kinds of shipping lanes, Precautionary Areas (places where mariners should use extra care) and Areas to be Avoided (ATBAs) (places through which specific types of vessels should not travel).

The Coast Guard has already worked with the International Maritime Organization (IMO) to designate important routing measures in the U.S. Arctic. In the Aleutian Islands, there are now a series of ATBAs that establish 50 mile buffer zones around most of the islands. These buffer zones encourage vessels transiting the Great Circle Route to maintain a safe distance from the coast, which not only helps keep vessels off the rocks, but also provides additional time to respond if a vessel loses propulsion.

In addition, the Coast Guard successfully completed a Port Access Route Study (PARS) in the Bering Sea, Bering Strait and southern Chukchi Sea. The Bering Strait PARS led to formal establishment of voluntary vessel traffic routes in this region. These routes encourage ships to travel along a predictable and consistent path, which helps prevent accidents. The designated routes have been surveyed to modern standards, so vessel masters can be confident they will have plenty of water under their keels. In addition to the establishment of vessel routes, the Bering Strait PARS led to the designation of three ATBAs around islands in the Northern Bering Sea. These ATBAs were developed with input from local communities and are intended, in part, to protect subsistence uses.

With the completion of the Bering Strait PARS, the Coast Guard is considering a similar process in the more northerly waters of the Chukchi and Beaufort seas. Ocean Conservancy strongly supports a Chukchi/Beaufort PARS. It is the logical

next step and will help establish safer shipping corridors that stretch from the Aleutians to the Central Arctic Ocean.

When it begins the Chukchi/Beaufort PARS process, the Coast Guard must conduct meaningful outreach to communities, tribes, and other Alaska Native organizations to help ensure that outcomes from the process are supported by and meet the needs of those who live in the region. In addition, the Coast Guard should coordinate with Canadian counterparts to ensure vessel traffic routes align at the U.S./Canadian border. Finally, the Coast Guard should keep in mind the highly seasonal and dynamic nature of the Chukchi and Beaufort seas. Seasonal or dynamic measures could be designed specifically for these unique Arctic waters. Such management measures would move in space and or time to account for changes in sea ice, marine mammal migration and concentrations, and subsistence hunting of marine mammals.

#### *Alternative Planning Criteria*

In U.S. Arctic waters, long distances between ports and coastal villages can make it impossible to satisfy certain requirements for vessel response plans mandated by regulations implementing the Clean Water Act and Oil Pollution Act of 1990. As a result, Coast Guard regulations provide for the use of Alternative Planning Criteria (APC).

In situations where standard vessel response plan requirements are not feasible, the Coast Guard's APC regulations allow vessel owners and operators—or independent organizations that represent owners and operators—to apply for permission to use alternative ways of preventing and responding to a worst-case discharge. Ocean Conservancy applauds the Coast Guard's recognition that prevention measures—such as routing measures and 24/7 vessel tracking—can play a vital role in APC programs.

While Ocean Conservancy supports the concept of APCs, the Coast Guard's implementation of the APC program in Alaska could be improved. The Coast Guard's approach has created a situation where different Coast Guard-approved APC organizations vary significantly with respect to the amount—and location—of oil spill response equipment they provide. This system not only fails to maximize oil spill prevention and response resources, it threatens to create a “race to the bottom” that will ultimately reduce the amount of money available to invest in the build-out of response resources in the region.

Ocean Conservancy appreciates the Senate's attention to this matter in the recently-passed Coast Guard Reauthorization package. Among other things, that legislation requires any APC approved for the Arctic to verify that operators have conducted in-region training and that equipment has been tested and proven capable of operating in the region. We also look forward to the Coast Guard's report on its implementation of APCs, which should provide insights that can help improve prevention and response measures in the Arctic.

#### *Discharge*

Absent effective mitigation measures, the growth in Arctic vessel traffic will increase the amount of pollutants that ships discharge into the region's waters. These discharges can include graywater, sewage, marine debris, and the other chemicals, all of which can contain pollutants that have negative effects on marine wildlife, fish, and other resources. The Arctic may be uniquely vulnerable to the impacts of discharge from vessels. For example, the Bering Strait is extremely shallow and pollutants may not disperse as quickly as they do elsewhere. The abundance of wildlife and the critical importance of this wildlife to indigenous peoples of the region also heighten the risks associated with discharge from vessels.

International rules, including the Polar Code, restrict some forms of discharge in some portions of the Arctic. However, significant gaps remain. For example, international law does not regulate the discharge of graywater—a category that includes wastewater from dishwashers, showers, laundry machines, washbasin drains and similar facilities—even though graywater can be just as detrimental to the marine environment as raw sewage. Ocean Conservancy supports more stringent restrictions on discharge of pollutants from ships in Arctic waters to prevent adverse impacts to Arctic peoples and wildlife.

#### *Vessel tracking and communication*

Accurate and timely tracking of marine traffic can help ensure problems are spotted and addressed early. Similarly, efficient communication of relevant information can help ship operators and other maritime users avoid hazards and conflicts, including potential conflicts with subsistence users. In recent years, improvements to maritime navigation and communications technologies likely played a key role in preventing shipping accidents. These technologies continue to advance, and there

are opportunities to collaborate with vessel operators on data needs and technology requirements as well as coastal communities to harness those advancements to make even more progress.

Both satellite- and VHF-based Automatic Identification System (AIS) technologies are already used to track vessels as they travel through U.S. Arctic waters. AIS technologies are capable of transmitting more data, including information about weather, sea ice, or the presence of marine mammals and or subsistence hunters. Moreover, AIS technologies—in concert with Geographic Information Systems (GIS) and integrated electronic display systems—can ensure that mariners receive this information only when it is relevant. Ocean Conservancy encourages the Coast Guard and other Federal agencies to support and facilitate the use of these and similar technologies as important tools to prevent and mitigate the impacts of maritime accidents.

#### *Charting*

Accurate, up-to-date nautical charts should be a foundation of maritime domain awareness, but just a tiny percentage of the U.S. Arctic has been charted to modern standards. In their Arctic Vision and Strategy, NOAA has acknowledged that “confidence in the nautical charts of the region is extremely low,” and that “[m]ost Arctic waters that are charted were surveyed with obsolete technology, some dating back to the 1800s.” This problem is not merely hypothetical. In 2015, a vessel supporting Shell’s oil exploration efforts was damaged when it grounded in poorly charted waters near Unalaska. The following year, a Norwegian tanker ran aground on an uncharted shoal near Nunivak Island.

Ocean Conservancy appreciates the Federal government’s commitment to improve and modernize Arctic charting and acknowledges the significant progress that has already been made. In recent years, NOAA’s Office of Coast Survey has released new or updated charts for some targeted Arctic waters, with more on the way. More recently, Congress reauthorized the Hydrographic Services Improvement Act, including \$10 million for Arctic hydrographic surveys.

We appreciate these advances and the hard work that has made them possible. We also recognize that the U.S. Arctic is vast and it will take an aggressive effort, secure funding, and efficient prioritization of resources to tackle the work of modernizing Arctic nautical charts.

#### *B. Response*

The first priority in preparing for increased vessel traffic should be prevention—stopping maritime disasters before they can happen. However, it is also necessary to continue to improve response capabilities to ensure we are prepared for accidents that might happen.

##### *Building Community Response Capacity*

Residents of the Arctic region should receive priority consideration in determining how to best build out response capacity in the U.S. Arctic. In the event of a shipping accident, residents of coastal communities are likely to be first responders and are likely to be most directly affected by the impacts of a spill. To help mitigate these burdens, all Arctic communities should receive spill response equipment that is appropriate to the local environment as well as training in the proper use of that equipment. These steps would bolster response capacity and could also provide jobs for residents of local communities. Additional funding for regionally appropriate response resources in U.S. Arctic communities would help increase preparedness.

##### *Polar Security Cutters*

New icebreakers, or polar security cutters, are an important part of any plan to improve response capacity. As Arctic sea ice diminishes and maritime activity in the region grows, the need for additional icebreaking capacity will only become more acute. In addition to Alaska and the rest of the Arctic, icebreaking capacity is also important in sub-Arctic and cold-water regions, such as the Great Lakes, which also experience seasonal ice. The anticipated increase in U.S. icebreaking capacity will fill a critical gap in maritime infrastructure and enable the Coast Guard to better meet national security, search and rescue, law enforcement, environmental protection, and other critical Arctic missions—365 days a year.

Ocean Conservancy appreciates Congress’s commitment to expand U.S. icebreaker capacity, both via maintenance of the Polar Star and via acquisition of new polar security cutters.

New polar security cutters represent a long-term investment in our Arctic. As the Coast Guard moves toward acquisition of these vessels, it can develop designs that minimize air pollution, water pollution, and underwater noise. Acquisition of new

vessels provides an opportunity for the Coast Guard to showcase world-class design and engineering.

*Arctic Shield*

In the Arctic, the nearest permanent Coast Guard station is in Kodiak, more than 950 air miles from the Beaufort Sea. However, for multiple years, U.S. Coast Guard District 17 has deployed personnel and resources to the Arctic during the open water season to conduct safety and security operations in the region. These “Arctic Shield” activities have included search and rescue, emergency response, trainings, community outreach and law enforcement.

Seasonal deployment of Coast Guard resources and personnel to the Arctic is critical to ensure preparedness. In continuing this effort, the Coast Guard can and should strengthen its outreach to residents of Arctic communities, including meaningful consultation with Alaska Native Federally-recognized Tribes regarding activities and policies that take place in or affect Arctic waters. Congress should ensure that Coast Guard District 17 has secure, consistent funding to continue and strengthen Arctic Shield operations and to undertake more robust outreach to Arctic communities and organizations.

**IV. Conclusion**

The decisions we make today will affect the Arctic for years to come. If we make management decisions based on the best available science and technology, engage the range of stakeholders living and operating in the region, focus on targeted preventative measures and continue to build-out regionally appropriate response capabilities, we can ensure that safety and environmental protection measures keep pace with the rapidly changing maritime transportation sector.

Thank you again for the opportunity to be here today. I appreciate your time and I look forward to the Subcommittee’s questions.

Senator SULLIVAN. Great, I want to thank again, all the witnesses for their very informative testimony. Want to notice we have Senator Wicker here, the incoming Chairman of this important Committee in the next Congress. So, thank you, Senator Wicker for joining us. I am going to begin just opening questions really to any and all the panelists on some of the issues relating to the traffic and let me begin by asking, is there a benefit to persistent 24/7 man-vessel traffic system for the Arctic, and if so, why? If you can provide us details. And again, I would like to open this up to any and all of you, Captain Page, why do we not begin with you, sir?

Captain PAGE. Yes sir, actually to some extent right now, we do have a 24-hour monitoring system and prescribed routes by the industry, that is, throughout the Arctic waters. And so—

Senator SULLIVAN. How can that be improved and what more would we need?

Captain PAGE. Well I think we need from this point is a better way of communicating with vessels with automatic identification systems. The technology of the Arctic Next Generation Navigational Safety Information System, which I mentioned beforehand was a R&D project. So we improve upon that and also we need to have better routing measures for the Beaufort. Ours is fairly simplistic, stay well enough offshore to give us time a vessel breaks down that they do not immediately end up on the beach. So I think as the Coast Guard looks at identifying—IMO adopted routing measures in the Arctic that will prescribe some level of order and keep them away from areas to be avoided and ensure that traveling waters are adequately charted.

Senator SULLIVAN. Anyone else on that question in general?

Mr. HARTSIG. I—

Senator SULLIVAN. Mr. Hartsig?

Mr. HARTSIG. Yes, thank you. I would agree with Captain Page in terms of making the most of next generation technologies, maritime communications, and navigation technologies. A lot is changing, and I think we can do more to capitalize on that. And this idea of two-way communication and having information show up on an as-needed basis on some of the electronic charting and display systems in vessels, I think we can do a lot more with that in coming years.

Senator SULLIVAN. Let me ask another question, I'll start with you, Mr. Goodwin, but it is truly for everybody, what do you feel are opportunities, certainly that we can talk about, but the biggest threats to a safe and environmentally sound shipping in the Arctic and the impact on the coastal communities that you highlighted so well in your testimony.

Mr. GOODWIN. Communication system that would include ship to shore. But it would be communication of ships they traverse our waters to inform them of small boats where our hunters are located and/or marine resources.

Senator SULLIVAN. Anyone else on that question? Ms. Metcalf or Captain Page, you care to comment?

Ms. METCALF. Yes.

Senator SULLIVAN. The biggest threat to safe, environmentally sound shipping in the Arctic?

Ms. METCALF. The biggest threat, to me, is having inadequate vessels and I am answering, with your permission, for the entire Arctic.

Senator SULLIVAN. Yes.

Ms. METCALF. As I said earlier, the U.S. Arctic is a small piece, and if something happens elsewhere, it may certainly impact our coastlines as well, but we are all trying to protect the Arctic. I think having the competency of mariners, which the Polar Code training requirements now address, to me the biggest threat is what makes the front pages, unfortunately, and that is spills and potentially with passenger tourism traffic, what is expected to increase—the thought of a 3,000-passenger ship, hundreds of miles away from rescue presents a formidable challenge that I think the world has to address.

Senator SULLIVAN. And we are seeing an increase in the tourism levels, correct?

Ms. METCALF. Yes sir. We do not represent the cruise lines but yes, it has been well documented that the Arctic is a destination where expeditionary type of voyages and—

Senator SULLIVAN. The old expeditionary voyages.

Ms. METCALF.—the old expeditionary voyages were a lot less populated. I—Will you may be able to help, but when the *Crystal Line* ship went up, I think there was a couple thousand passengers on board that ship, but I know for a fact that they are looking at an excess of 2,000 passenger ships going up there for a cruise, and I think that is a wonderful thing, but I know the cruise lines is taking great actions to make sure that any kind of incident that occurred up there would be provided for in the appropriate way.

Senator SULLIVAN. Great, I was just given some notes here. Twenty-six new polar cruise ships are set to launch in the next 3 years, which is a 45 percent increase in terms of passengers ex-

pected close to 38,000 cruise ship passengers in 2020. And I could not agree more with you that if God forbid we did have some kind of accident, we certainly do not have the capability to safely rescue them right now.

Senator Baldwin, on that ice note, I will turn it over to you.

[Laughter.]

Senator BALDWIN. Well, I am struck by how much what we are talking about today also applies to the Great Lakes. Many of you have referenced that and including the negative economic impact of inadequate U.S. Coast Guard ice breaking capacity. Simply put, we need more ice breakers to support commerce and keep mariners safe in the Arctic and in the Great Lakes.

The facts speak from themselves. During the winter shipping seasons between 2013 and 2015, severe ice coverage resulted in \$1 billion in lost economic activity. Last winter, with relatively light ice, the Coast Guard had 246 lost ice breaker-operating days, due to maintenance or casualties in industry, reported the delay or cancellation of over 6 billion tons of material due to ice. Alarming, some of these lost days were on ice breakers that have already gone through a life service extension program, demonstrating that the updates being made are not making these ships any younger or more reliable.

Ms. Metcalf, can you please explain the importance of Coast Guard ice breakers to your members and the role they have in supporting commerce, and additionally, how does the performance of these ice breakers impact your shipping season?

Ms. METCALF. Thank you for the question Senator Baldwin. I have to admit that I have tried to go through retrofit, and it has not made me any younger, either.

Senator BALDWIN. Yes.

Ms. METCALF. So, I—

[Laughter.]

Ms. METCALF. I can appreciate what is going on here. I am not a marine engineer that can talk about the ice breaker maintenance, other than the fact that when you need them—us and the commercial industry, you need them. And if there is ever a doubt that they are not going to be available, then the prudent thing is to simply not trade, which is what we call the end of the season up in the Great Lakes. It is critical to understand—and I am speaking from a commercial vessel perspective—that you could only stretch out the age of a vessel for so long. You are fortunate in the Great Lakes, because you have, in most cases, fresh water. So a number of the Salties are much, much older than the typical 25 to 30-year lifespan that we see in the salt water operations. But it is absolutely critical to recognize that with the best maintenance and repair and the best engineers working on those ships, eventually they need to be replaced, and hopefully replaced with a vessel that embodies the newest technology, both propulsion systems, construction methods, navigating systems, communication systems. So it is absolutely critical, yes ma'am.

Senator BALDWIN. The Great Lakes are also the world's largest freshwater system, provides—it provides drinking water to over 35 million people. The oil spill that happened earlier this year in the straits of Mackinaw really highlights the importance of having

freshwater specific and cold weather, spill-response plans. Fortunately, a large oil spill has not occurred in the Great Lakes, but we really need to be ready in case one does. We have made an important step forward in the recently passed Coast Guard bill, which authorized a Coast Guard Center of Excellence to study and address the unique Great Lakes environment.

Captain Page, during your career, you served as a captain of the port and chief of marine safety and environmental protection for the Coast Guard's Pacific area. Can you talk about the need to develop strategies to respond to an oil spill, and particularly, in icy conditions, like those in the Arctic and the Great Lakes?

Captain PAGE. Yes, Senator. The Chair—it has continued to be a daunting problem. I have been in the Arctic doing oil spill exercises on the frozen ice and what have you. And certainly, much more complex than the Gulf of Mexico, you know, and the Great Lakes are up in the Arctic nation. So, it is something that needs more work. I do not have the silver bullet; people keep on working it, but we do need to improve that capability, and I think—and also the ship board meeting firefighter salvage regulation. The Coast Guard came up with it. It was a great way of kind of keeping the oil from a damage vessel from entering the water. So, I think it is another important component is, to keep it out of the water is your best bet, and I think if you look at the California fires, they realize that prevention—and that may mean more fire trucks but probably more prevention measures is probably the best way to go about it.

So, I continue to harp upon prevention, but I also know that you can still can have fires, car accidents, despite all our efforts. So, you still need the ambulances and the fire trucks, oil spill response capabilities and they need to be improved upon. So, I am glad to see that is being addressed in the legislation, and I am sure that we can continue to make progress in that area.

Senator SULLIVAN. I am going to ask a few more questions, you know, I had put up a chart on the different sea routes, the Northern Sea Route and the Northwest Passage. I would like our witnesses, any and all of you, to do a little bit of comparing and contrasting. What are the benefits? What are the drawbacks for each of those routes that you see for the future?

Captain PAGE. Well, I see that the Northwest Passage is more challenging avenue to take in light of the fact that the Canadian waters are shallower—Archipelago Islands, they claim sovereignty over that waterway and shallow draft and more ice concentration. So it more challenging, the Northern Sea Route, but I think that, over time, as the ice recedes from that area, that it would be a much more—easier for vessels to navigate through that passage. And then our challenge is going to be, we are going to have a lot of vessels engage in innocent passage, not subject to Coast Guard regulations, because they are on free trade, transiting through our backyard, if you will, through the Arctic waters and going through other foreign ports. So, I think that is another challenge to work with the international maritime committee, setting standards so that ensures there is a consistent approach, which as I mentioned beforehand, consistent integrated approach to the Arctic nations recognizing we are in the same boat. It is in the best interest to

ensure that all vessels comply with consistent vessel routing measures and monitoring and standards of care throughout.

So, I see that—but clearly, the Northern Sea Route is an easier route and for the support, if you will, by the Russians who have a lot of commodities they ship out. So, they invest a lot of major ice breakers and facilitate that trade. We obviously do not have that same capability on our side of the Arctic.

Senator SULLIVAN. So, right now the Russians have 40. They are planning on building 13 more, some of which are nuclear-powered. Some of which are weaponized. Can you talk about if they are charging fees? We talked about Putin talking about the new Suez Canal and how Russia is going to own that. What exactly are they doing in terms of charging or other requirements to go through the Northern Sea Route?

Ms. METCALF. I can try. I do not know, in dollar terms, what it is. All I envision for the Northern Sea Route, is its whole plaza like we see at the New Jersey Turnpike. And I worry very much that countries are going to, because of their geographical position, are going to attempt to use the Arctic as a cash cow, rather than recognizing that a free Arctic is the best benefit of every nation.

Senator SULLIVAN. Any other thoughts on that, the Northern Sea Route or others? Mr. Hartsig?

Mr. HATSIG. Thank you. One of the concerns that I have is there is a tremendous buildup of L&G facilities on the Yamal Peninsula in Russia, that I think is going to—has already created additional traffic and in coming years, will generate even more traffic on the Northern Sea Route. One of the interesting things, whether it is the Northern Sea Route or the Northwest Passage or even at some point in the future going straight over the top, all of those routes converge at the Bering Strait. So, all of the traffic is going to be through a relatively narrow bottleneck and exposing U.S. waters to whatever kind of risks there are from increased traffic. So, I think it is extremely important to have those international standards that we are talking about. That's—the Polar Code has gone along with, but I think we can do more and also makes the recent Bering Strait PARS and areas to be avoided, a really important step.

Senator SULLIVAN. Good point. That is a really important point. Let me turn to the issue that I raised in my testimony and some of you raised in your testimony, and that is the issue of infrastructure in ports. What role do you foresee any of the future deep water Arctic ports playing, whether it is Point Spencer or Nome or other areas or facilities like you mentioned, Mr. Goodwin in Kotzebue for increase in traffic in safety in the coming years, and how important is that? You mentioned just how remote it is from, you know, the other ports and so did I in my testimony, but I would like the witnesses to expand upon this issue, because I think it is an issue that unfortunately does not get a lot of play outside of Alaska and, you know, what I have concerns about is some day it is going to get a bunch of play outside of Alaska if there is some kind of, you know, incident that we have to respond to in terms of an emergency.

Mr. GOODWIN. Thank you. In terms of an emergency, we have nothing. Nothing, completely nothing up north. So, what do we do? You know we have our smaller craft hunting, and they would be

the first responders if anything happens up there. But without a port or any kind of infrastructure, there is nothing we can do. And also, I would like to point out that we very much would like to see the PARS for the Chukchi and the Beaufort Sea get done as soon as possible. Right now it is a free for all. Ships can go anywhere they want.

Senator SULLIVAN. And you are the Chairman, as I mentioned, Mr. Goodwin, of the Arctic Waterways Safety Committee, do you feel that you are getting decent access into the Coast Guard as they are working through this PARS? Your views, are they reaching out to you?

Mr. GOODWIN. Yes, the Coast Guard is very good at working with the Arctic Waterways Safety Committee with all these issues that we are putting forth in our safety plan and other issues, and they recognize the need for infrastructure for a port for any kind of a disaster that could happen.

Senator SULLIVAN. Good. Other thoughts from other witnesses on the issue of ports?

Captain PAGE. Yes sir.

Senator SULLIVAN. Captain Page.

Captain PAGE. You are talking about the distances from the Arctic and then Nome is the closest actual port that is operating near the Arctic waters, and the capacity Gnome was really designed right now to accommodate the needs of the Arctic communities, it is not with respect to additional shipping in the Arctic, it is really delivering goods and supplies to the people who live in that region, the northwest Arctic regions. So, I have been to Gnome at times when I see the Coast Guard, the ice breaker offshore and shuttling supplies and personnel through small boats, because they cannot come up to the dock. So, they have to well offshore and shuttle things back and forth. Similarly, NOAA vessels have a difficulty coming to that dock, because of the capacity and the water depth and what have you. So, enhancing, expanding that port so that it can accommodate the needs of off-shore supply vessels, the Coast Guard vessels, NOAA vessels, possibly even Naval vessels, would dramatically improve the logistics support capability that are needed as we expand maritime operation in the Arctic, including emergency response resources.

Senator SULLIVAN. But every witness agrees that we need more infrastructure support port capacity in that region, correct? I see for the record, all four vigorously nodding their heads.

[Nonverbal response.]

Senator SULLIVAN. That is great. Senator Baldwin.

Senator BALDWIN. So it is imperative that mariners have current and accurate charts, especially in the harsh Arctic environment. I have been informed that some of the charts could date back as far as the 18th century, which was surprising to me, and I concur with Senator Sullivan that we need more charting, both in the Arctic and Great Lakes. In fact, that is why we teamed up in introducing and passing the Digital Coast Act, which would help improve the mapping and imaging products that help communities keep safe and help commerce keep running.

Earlier this year, it was reported that less than 2 percent or about 4,300 square nautical miles of U.S. Arctic waters have been

surveyed with modern multi-beam technology. Ms. Metcalf, what are the implications of not having charts available that accurately reflect the hazards your shippers could encounter, and how have members of your industry adapted their operations as new routes open up in the Arctic and tell us what modern, multi-beam technology is?

[Laughter.]

Ms. METCALF. I'll put my NOAA hat on and pretend like I know. No, I will address that. I can compare the Arctic to—let us say you wanted to go on a hike deep into the wilderness in the United States. You would not go out there by yourself, with a compass and a camera. You would probably have to find, or want to find, somebody local that knows the area. The people that have been operating, at least our members that have been operating the Arctic—and Crowley in particular, maybe a couple of other companies—have been doing it for years, as indicated the 1950 start by servicing the Due Line. At this point, it is experience. They are the high trail guys.

The concern, of course, is when other companies that have not operated in the Arctic, decide well this is an opportunity, let us go up there and do it. They need to appreciate the risk associated with not having the experience level that the current operators have. The sonar that you are referring to, to the best of my ability, we used to do, well NOAA used to do sonar scans and you would do depth scans. It is now almost, to the best of my knowledge, a 3D type of sonar. So, you can see not only the vertical but also the horizontal to some degree and gives a much more accurate read. So, it is something that is very much needed, but quite frankly, thankfully NOAA is narrowing and reducing the backlog, even in charts down here in the lower 48. So, it is a challenge for them to keep charts up to date. It is a little easier now, because we do not have monks actually drawing the charts anymore. They are all in digital form. So, they are much easier to adjust and upload on the ships. Thank you.

Senator BALDWIN. You know, we have been talking today, a lot about the retreating sea ice creating opportunities for increased commerce in the Arctic. I would like to talk a little bit more about what is causing that ice to retreat, and that is climate change. Mr. Hartsig, can you describe for us the impacts of climate change in the Arctic and with the impacts from climate change and human activities in the Arctic on the rise, how do we maintain the natural resilience of Arctic ecosystems?

Mr. HARTSIG. Thank you for that question. The biggest impact of climate change, I think, is on the sea ice. And like I said in my testimony, we see reduced extent of sea ice, reduced thickness and shorter ice seasons, and that is having all sorts of implications for wildlife, because it is habitat for a lot of ice-dependent species but also for communities, and Mr. Goodwin can talk much more eloquently than I can about the impacts to subsistence hunters. So, I think that is kind of the number 1 impact. But warming in general is also having tremendous impacts on thawing of permafrost and affecting infrastructure and then in terms of what we can do to mitigate it, the challenge, of course, is that climate change is global in nature. So, it is affecting communities in the Arctic who

really, on a grand scale, have contributed very, very little to the causing climate change but are bearing the greatest impacts from its effects.

So, it is unquestionably a challenging problem. In terms of the shipping industry, a couple of things come to mind: one is reducing the output of black carbon or soot that will basically absorb heat, and it is a particular problem in the Arctic and kind of exacerbates the effects of warming there. But the shipping industry also has been a little bit slow in terms of taking responsibility for reducing emissions, although I will say they are making progress at the International Maritime Organization and even in the industry itself. I saw just, I think yesterday or the day before, Maersk has committed to a carbon-free shipping by 2050. So, things can be done and things are moving. So, I do see some hope on that front.

Senator SULLIVAN. Well, listen, I would like to go into a couple of other topics, and again, these are questions for the entire witness panel. There is a lot of discussion about the Coast Guard PARS and one of the things we will do after this hearing is look at the timing of this, you know, it is important. Mr. Goodwin, you mentioned it is important to get that out soon. Some of my concerns are that it is important to get it right, but it is also important to get it done. And when I hear, you know, issues of like perhaps 4 more years or something along those lines, I do not think that is the time-frame that any of us are looking for, despite the fact that we are certainly complimentary to the Coast Guard of the fact that they are undertaking this important route study.

Let me ask each of you, what would you like to see in it? What, right now, here is an opportunity I am sure major Coast Guard officials are watching this hearing. What would each of you like to see in the Arctic Port Access Route Study that they are currently undertaking?

Captain PAGE. Well, I will start, Senator. In light of the fact that I have been involved with some of these discussions before, and in fact, involved in the current PARS that went down, started about like about 8 years ago, I think ago, actually. So, when you talk about multi-year process, it can be very complicated. So, like yourself, I would like to see a faster development of the PARS. I would hope that—

Senator SULLIVAN. What are you hearing that the timeline is right now?

Captain PAGE. I have not heard a timeline on the PARS, for the new one or that they are anticipating. I know they plan on having some documents come out this spring on it and start—and they realize how much bigger area the Bering Strait, which is one of the complicating factors and what I would like to see is that they recognize the fact that you may draw a line through the Arctic, but if there is ice there, they are going to go around the ice. And so, we have to have a somewhat flexible dynamic or multi-faceted type of routing measure, because we do not know where the ice is going to be, and the ships have to avoid the ice in many cases, and I have seen that happen where tankers normally go 20 miles offshore, all of sudden, they are way offshore to avoid a whole bunch of ice. And I think in light of that, to continually have what they did in the PARS, for the Bering Strait, you have areas to be avoided. In some

cases, they are going to be dynamic in nature because of the whalers engaged in whaling activity, that is a dynamic area to be avoided or there are marine mammals move to a particular area. So, it needs to recognize the Arctic is changing. The ice is changing; the environmental protected areas are changing.

So, it has to be some dynamic aspect of it and areas to be avoided. So, it is fairly complicated, multi-faceted. You cannot just draw two lines and say, "Go there." Recognizing when they go outside, they could be going to an area that you do not want them to go to. So, you have got to define the no-go areas and preferred areas and alternative areas and have the ability to apply dynamic information to vessels. So—but I think it is something the Coast Guard needs to do. I know they want to do it. I hope they have the resource to do it. I know it is another big workload on their part. I hope the Congress supports them in getting that done if it requires additional resource or what have you.

Senator SULLIVAN. Great, thank you. Ms. Metcalf, do you have a view on the PARS?

Ms. METCALF. I can shorten it down and say, yes, I agree. The two points though is, one is the nature of the dynamic area, you will hear some objections from some of the shipping industry on that. We have already set a precedent on the East Coast of the United States with dynamic management areas for the avoidance of ship strikes for white whales. So, it is possible to do it. It is difficult and the communications of these areas as they move are absolutely critical to the shipping industry.

The second point I would suggest in the PARS, on how we do it, perhaps through the Arctic Council, is I am going to guess most of the other 7 Arctic nations besides the United States are looking at this already, and we need to put our puzzles together so there is a unified PARS for the entire Arctic. Because if Canada does a PARS study and says, "You should come out at this point," and our PARS says, "No, we should come out at this point," then we have got a little difference here. And so we need to try and align internationally, these routing studies so that they all work.

Senator SULLIVAN. Great. Thank you. Mr. Goodwin, PARS.

Mr. GOODWIN. Well, with the experience that we have had with the part that go—went through the Bering Strait, I think the communities along the North Coast are ready to provide the information that is required or will be needed. So, I do not suspect that the time-frame will be as long as it is with the last one, because the information that we know we can provide. And also for your information, the Canadians—the Canadian Government appropriated \$1.5 billion to do a water program. So, they have started on their procedures with what kind of safety do they want on their systems. So, right now it is the Cambridge Bay Area and British Columbia, and also the Nunavut Settlement Area, which will connect to our PARS, have started discussions on that. So we have got to work together to make sure that they work.

Senator SULLIVAN. Do you believe that the Coast Guard was responsive to your communities and other coastal communities in Alaska? Were their concerns reflected in the last PARS?

Mr. GOODWIN. Yes, they—the testimony that was given, I think they took everything to heart and adjusted some of the routes to

satisfy different seasons for hunting, different species. So I think we can do that again.

Senator SULLIVAN. Good. So, there was a good precedent the last time, of them listening to the local communities?

Mr. GOODWIN. Yes.

Senator SULLIVAN. Good. Mr. Hartsig. Do you have a view on the PARS?

Mr. HARTSIG. Yes, I think I will echo a lot of what has been said. Maybe I can boil it down to 5 things. I think when the Coast Guard considers the PARS, it has to be a safe and efficient route that provides the requisite services to communities or else there is no point in doing it. It has also got to protect subsistence users and subsistence resources. It has got to protect special places in the Arctic, marine environment that have special sensitivities and like Captain Page said, it is—this is a dynamic environment. So to the extent that we can have a dynamic, or at least seasonal management, I think that is important. And finally, connecting the dots, especially with Canada, to make sure that we are—have alignment at the terminus of the route.

Senator SULLIVAN. Great. Let me ask another question that has been referenced a few times, but how important is and what benefits do you see in the recently enacted Polar Code? And again, I will just open this up to any of you. Ms. Metcalf, I am sure you know a lot about this. You want to start or Captain Page.

Captain PAGE. Well I am sure we can both comment on it, Senator. I think the Polar Code is a good step in the right direction. It certainly raised the bar, recognizes we have a unique operating environment. So, it puts additional requirements on both vessels and then ensures they are constructed to meet the ice that they are going to encounter, what have you. I do think it also places some responsibility on a coastal state, such as the U.S. obviously on ensuring that we are providing information to mariners to make sure they have a safe passage. So there is a voyage-planning component of the Polar Code where vessels are supposed to plan ahead of time when they are going through some waters, they do so safely. But the coastal states have an obligation to provide information to vessels. So, what is a safe route and what have you? So, I think there is some commitment on our part to fulfill those aspects of the Polar Code so the mariners have the best information, know the routes, know the hazards, ices and what have you. So, it is brokering information, and I think that is an area that we can put more attention to. But I think the Polar Code is certainly a step in the right direction, and it does help raise the bar as far as the standards for vessels, and I defer to Kathy.

Ms. METCALF. Thank you. I apologize for my coughing, Senator.

Senator SULLIVAN. It is that time of year. No problem.

Ms. METCALF. It is, yes. The way I look at the Polar Code, it is making sure trained mariners, specifically trained for Arctic operations are put on a constructed ship unique for the Arctic operations for which they are designed, with all the right equipment and in some cases, equipment beyond that more temperate area operating ships would have because of the remoteness of the area. And plugged into the necessary infrastructure so that it becomes

a polar system. The right people, the right ship, and the right infrastructure.

Senator SULLIVAN. Anyone else on that? Mr. Goodwin.

Mr. GOODWIN. Right now, most of the coastal communities are beginning to outline their hunting areas by the season and also our knowledge of their resources out there—marine mammals when they come up, when they have their young—that information will be available so that the mariners can know they are approaching certain areas with certain hunting periods for certain species. And we will have that information from our travel code.

Senator SULLIVAN. Good, thank you. Mr. Hartsig, any views on the code?

Mr. HARTSIG. I think like everyone else on the panel, I think that the Polar Code is a great step forward and really important. I guess, my only real concern is that we do not view it as an end point. It does not do everything. One of the things that it does not do is, like Mr. Goodwin was saying, designate specific areas that need protection whether that is for subsistence or areas of environmental sensitivity. And then, even in a broader sense, there are some things that were left out of the Polar Code. Not only in the Arctic but worldwide, there are no regulations on the discharge of gray water, for example. That could be an important issue in the Arctic. So, I think there is still some work to do but no question, it is important and a lot better than where we were before we had the Polar Code.

Senator SULLIVAN. Good, I think it is a good example of, you know, as all of you mentioned, an important step.

Let me conclude with a couple of questions relating to ice breakers. You know, it is not just for transportation, it is for defending our sovereign interest in the region. We talked about Russia. The other country that is becoming very active, aggressive, in the Arctic is China. And so, the good news is, I think you are starting to see just what Senator Baldwin and myself but a broad base number of members of Congress, Democrats and Republicans, who have grown interested in the issue of both ice breakers on the Great Lakes but just as importantly in the Arctic. The National Defense Authorization Act, this year, which was signed into law by the President in August had a provision that I authored. This is for the military to authorize 6 polar class ice breakers. They are not appropriated yet, but the fact that they are authorized in law, very strong bipartisan vote on that, by the way, in the Armed Services committee. I think, was an important step.

But what I want to actually talk about is kind of related but not really, the Coast Guard is not in the salvage business, nor should they be, in my view. What is private industry doing to prepare for any type of salvage and recovery scenarios in the Arctic, meaning do we need like an Arctic AAA to be able to support the eventual increase in shipping traffic through the Arctic? Again, a lot of your testimony, all of you, has been about preparation. So what is happening in that area, particularly with regard to private industry?

Captain PAGE. Well, Senator, that is a very challenging question, and I think it is a matter of volume and whether this even pencils out as far as economical. Obviously at this point and time, there are so few—limited shipping out there that it would never pencil

out to pay for a vessel to be parked in the Arctic, to, you know, be available for salvage purposes. But I think, over time, as shipping increases that certainly needs to be the solution.

You mentioned the Polar Security Cutters and ice breakers of the Coast Guard you are planning on. I applaud your efforts and persistence and success in moving that ball down the field. I think in some cases that I would hope that the Polar Security Cutters are somewhat of a Swiss Army knife of capabilities. They are relatively fast. They give search and rescue. They have a law enforcement capability with some weaponry so they can enforce the laws and treaties. They can—but they all should be able to intercede when a vessel is in distress, to stabilize the situation until commercial assistance arrives.

So—and when I was in the Cutter years ago, that is what we would do. We had towing capability and if a vessel broke down, we would just stabilize the situation until a commercial tug could grab it, and they would take over, and they would move on. So, I would hope that capability exists, because it never is really going to be in the near future, a number of tugs operating in the Arctic that can be available to respond to a vessel emergency, because it really does not pencil out financially and so I think that is going to be one of our problems. And if we make only vessels engage in U.S. trade, pay for that capability, then it is going to disproportionately drive vessel traffic and maritime operations into foreign ports, because they can skirt those costs by being on instant passage. And the Kentucky trade with Vancouver BC instead of Vancouver, Washington. So, we need to be careful you do not inadvertently direct traffic to other ports.

Senator SULLIVAN. Great. Any other thoughts on that? Ms. Metcalf?

Ms. METCALF. Yes, Mr. Chairman, the thing I would ask is that none of the members that already operate up there, one of their items in their basket of services is actually emergency response. And so, in fact, one particular member, I believe purchased a salvage company and the salvage company operates worldwide. So, I can see them as a business, from a business perspective, seeing the Arctic—development of the Arctic as something that would add onto that. But the other thing that I would add to is this is not unlike 1991 when we were all looking at Open 90 and trying to figure out where all these resources were going to come. And it is—it would be nice if it was a quicker process and we instantly had all the necessary response capabilities, but we did not then and we do not now and all we can do is push forward to get what we need as soon as we can.

Senator SULLIVAN. Great. No, it is clearly a gap, but the fact that people are starting to focus on it, I think is positive.

Well listen, I want to thank the witnesses here. Very, very informative. I think there is a lot of agreement. You could tell from the panel. I think you can see it among Senators and a lot of good ideas. My own sense is we are very behind on this issue relative to other countries, relative to what is happening and that is a problem, but the good news is, I think people are starting to wake up to it. And the leadership of the organizations and the individuals

represented here among our witnesses is a major reason for that. So, we will continue to focus on it.

I certainly intend to be the Chairman of this Committee in the next Congress, and we will see if that happens. I hope it does, but I am going to continue to focus on these issues, and we will certainly want the expertise represented here to remain engaged and, as you said Mr. Goodwin, I loved your opening statement about action. You are taking action. We need to start taking action, and we are going to get there. We will keep pressing.

So, I want to mention with regard to the hearing, the record will remain open for the next two weeks. During this time, Senators may submit additional questions to all of the witnesses for the record. Upon receipt of these questions, we respectfully ask the witnesses to submit their written answers to the Committee as soon as they can.

And again, I want to thank the witnesses for appearing today, in particular, my three constituents who traveled a long way to come to this hearing. I particularly want to thank the three of you for doing that. It is very important. It is not always easy. So, we will continue to focus on this, and we want all of you to stay engaged with us.

This hearing is now adjourned.

[Whereupon, at 10:51 a.m., the hearing was adjourned.]

## A P P E N D I X

WOODROW WILSON CENTER POLAR INSTITUTE ADVISORY BOARD  
*Washington, DC*

Dear Senator Sullivan,

As you convene the December 6 hearing titled “Preparing for Maritime Transportation in a Changing Arctic” in the Commerce Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard, I wanted to provide an update on the efforts we have made at the Arctic Circle and the Woodrow Wilson Center’s Polar Institute on ways to finance the infrastructure necessary for an Arctic Ocean that is—to quote words you and I helped write in the 2009 U.S. Arctic Policy document—“safe, secure and reliable.”

In late 2014, then-President Olafur Ragnar Grimsson of Iceland and Alaskan Alice Rogoff, co-chairs of the NGO Arctic Circle, asked me to lead an inquiry which became known as the Arctic Circle Mission Council on Shipping and Ports. I was joined in the leadership of this effort by former Alaska Commerce Commissioner Paul Fuhs, then-chair of the Marine Exchange and former Alaska Senate President and Bush Administration official Drue Pearce in this effort. In the four year time period, our team conducted presentations, consultations, conference calls and workshops with a wide variety of government officials, Arctic experts, shippers and shipping companies, labor unions, insurance underwriters, shipbuilders, icebreaker operators and others in Singapore, Korea, China, Japan, Russia, the US, Canada, the Marshall Islands, Greenland, the United Kingdom, Norway, Finland, Sweden, the Netherlands, and other nations.

We focused on three concepts:

- What it would take to develop an international “seaway” system for the Arctic Ocean and its approaches, modeled in part on the international St. Lawrence Seaway between the U.S. and Canada, that would collect voluntary fees or tariffs to defray the costs of icebreakers, ports of refuge, and other necessary precaution and response measures for safety and reliability.
- Developing a league of Arctic ports, who would work together to promote an Arctic seaway, and house infrastructure necessary for safety and reliability.
- Looking at new mechanisms to help finance necessary Arctic infrastructure. Those mechanisms combine options in public and private finance, insurance options, and regional (Arctic or Northeast Asia) Development Bank options.

Our working papers, including an early draft of potential legislation to create an Arctic Seaway Development Corporation, are available at [www.arcticcircleseawayreport.wordpress.com](http://www.arcticcircleseawayreport.wordpress.com).

For the purposes of your hearing this week, we wanted to convey the following:

1. Today, Russia’s Northern Sea Route Administration is the only end-to-end icebreaker escort service for ships using the Arctic Ocean. Fees charged for that service range near \$500,000 per voyage. A recent study conducted for Russian Authorities, presented at the Arctic Economic Council in 2017, indicates a large number of European/Asian port city pairs for which container traffic is likely to be more economic if a reliable container shipping service is established in the Arctic Ocean. If just ten percent of the approximately 18,000 vessels transiting the Sues Canal were diverted to Arctic shipping, approximately \$900 million per year would be available to support icebreaking and other services necessary for reliability.
2. Many shipping nation representatives we spoke with, especially in Asia, indicated they would feel more comfortable if a ship escort service in the Arctic Ocean were operated by an international consortium, rather than Russia alone. Many icebreaker owning nations and private companies indicated they would be able to make icebreakers and other resources available for a coordinated seaway service.

3. Among Arctic shipping experts we have met with, the estimated demand for Arctic shipping varies. New projects contemplated to bring LNG to market from the North Slope of Alaska and the Mackenzie River Delta of Canada may join Russian LNG expansion as users of the Arctic Ocean. This year, we saw a new test of container shipping by Maersk in the Arctic. A large number, reportedly more than 30, new ice strengthened cruise ships are in some phase of construction for Arctic and Antarctic operations. If a regular, fee-based icebreaker escort service were available, Arctic shipping could be expected to be higher.
4. Russia and Canada both claim ownership of waters the U.S. and other nations consider to be international waters. An argument for an international seaway agreement is that nations would work together to provide safety and reliability in this ocean, rather than stress conflicts over ownership.
5. Global leaders of the maritime insurance industry we met with encouraged our efforts to bring forward a seaway proposal, and indicated they might be able to help shippers decide to use the seaway's resources, for a fee, rather than going it alone. If legislation is introduced in the U.S. and in other countries to organize such an effort, insurance industry leaders we met with indicated an interest in providing testimony.
6. Ports of refuge and transshipment ports are needed to provide reliability in Arctic shipping. LNG bunkering fuel supplies may be necessary if heavy fuel oils are outlawed in the Arctic by the IMO. Helping to finance ports is an appropriate role for a seaway authority.

The hearing you've convened involves entities currently working hard to bring about safety, domain awareness, spill prevention and response capability in the Arctic Ocean. To their efforts, our concept of bringing icebreakers of several nations together to foster reliability, on a fee based service that Tero Vauraste has dubbed "Uber for Icebreakers," has a chance to make more funding available for the entire suite of needs in the Arctic Ocean. We look forward to seeing legislation to this effect considered.

The Wilson Center's Polar Institute has agreed to hold further meetings and workshops on the concept of an Arctic seaway, and we stand by to assist your subcommittee in your efforts.

Sincerely,

MEAD TREADWELL,  
*Chair,*  
Arctic Circle Mission Council on Shipping and Ports,  
*Co-chair,*  
Woodrow Wilson Center Polar Institute Advisory Board,  
*Lt. Governor of Alaska, 2010–2014,*  
*Chair,*  
U.S. Arctic Research Commission, 2006–2010,  
and Commissioner, 2001–2010.

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RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. DAN SULLIVAN TO  
WILLIE GOODWIN

*Question.* Today coastal residents and marine mammal subsistence hunters, operating in small craft, are the most numerous categories of mariners in northern Alaskan waters. Decreasing sea ice, changing weather patterns, and increasing large vessel traffic are increasing threats to the safety of our coastal residents. I congratulate you and our other northern Alaskan marine mammal hunter groups for taking the lead in standing up the Arctic Waterways Safety Committee. I understand that your experience working with the Coast Guard in Alaska, to bring the Waterways Safety Committee into being, was very positive. Can you tell me about your current experience working with the Coast Guard to continue efforts, through the Safety Committee and otherwise, to increase marine safety along our coast? Are there any areas where you think we need improvement?

*Answer.* Thank you for that question. Yes, our work with previous Coast Guard commands in Alaska was very positive. Beginning in about 2010, representatives of District 17 regularly attended local meetings in our communities and meetings of our hunter groups, asking for input on our experiences with changes in the ocean and increases in large vessel traffic. This is how we learned about Harbor Safety

Committees and formed the idea for the Arctic Waterways Safety Committee, which we stood up in 2012 in consultation with District 17 personnel.

Through 2016, we had an excellent relationship with District 17, including their Tribal liaison and senior officer program managers. All were fully engaged in collaboration with us, all the way up to the Rear Admirals, all of whom made a point of attending our meetings and visiting our villages. In between formal meetings and consultations, it was common for the Tribal liaison and senior officers to reach out directly to our local representatives to keep us informed about activity in our waters, especially the large vessel traffic. At the same time, they sought our input on management issues to enhance maritime safety up north. They clearly saw the safety of our mariners and hunters as a priority of their command. Similarly, they engaged us as their “eyes and ears” on the water in our remote region.

Unfortunately, since 2016, this engagement has dropped off significantly. District 17 personnel attend meetings and offer formal presentations, but the sense of collaboration and senior-level engagement is no longer there. Also lost is the inter-meeting outreach that helped us maintain two-way communications about upcoming large-vessel cruises into our waters or concerns that we might have about what we are seeing and experiencing in our coastal areas.

We understand that the Alaska region covers a very large amount of territory and it can be difficult for Coast Guard personnel who are new to Alaska to develop a rapport with folks from our remote communities. It seems that as soon as they do, their tour ends and they are reassigned elsewhere. We certainly appreciate these challenges, but we need to find a way to re-establish a fully engaged collaborative relationship with the Coast Guard. We are key District 17 stakeholders. Our residents and hunters are Tribal members. Our hunter groups on the Arctic Waterways Safety Committee are both Tribally authorized and co-management partners with either the Department of Commerce/NOAA or the Department of the Interior/FWS. Therefore, we have the authority and Federal recognition necessary for meaningful collaboration and consultation. We need our maritime colleagues in District 17, including senior officers, to re-engage in a collaborative and meaningful relationship that will ensure maritime safety along our northern coast and the protection of our marine environment.

