

**STRATEGIC IMPORTANCE OF THE ARCTIC IN
U.S. POLICY**

HEARING
BEFORE A
SUBCOMMITTEE OF THE
COMMITTEE ON APPROPRIATIONS
UNITED STATES SENATE
ONE HUNDRED ELEVENTH CONGRESS
FIRST SESSION

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SPECIAL HEARING
AUGUST 20, 2009—ANCHORAGE, AK
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THURSDAY, AUGUST 20, 2009

U.S. SENATE,
SUBCOMMITTEE ON HOMELAND SECURITY,
COMMITTEE ON APPROPRIATIONS,
Anchorage, AK.

The subcommittee met at 2:35 p.m., in the Lew Haines Memorial Room, University of Alaska Anchorage Consortium Library, Hon. Lisa Murkowski presiding.

Present: Senator Murkowski.

OPENING STATEMENT OF SENATOR LISA MURKOWSKI

Senator MURKOWSKI. Good afternoon. We are calling to order the Homeland Security Subcommittee of the Senate Appropriations Committee. We are here today for a hearing on the strategic importance of the Arctic in U.S. policy.

I would like to welcome all of you who have joined us. Again, good afternoon, and thank you all for joining us here today. I want to start off by first acknowledging Senator Robert Byrd, who is chairman of the Homeland Security Subcommittee of the Senate Appropriations Committee, and thank him for allowing us to have this field hearing here in Anchorage today.

It is great to be back up in the State, and it is great to be here in Alaska and holding a hearing on the Arctic here. Most of the time we hold these hearings back in Washington, DC. We invite the Arctic experts from Alaska and from other places to participate, but there is so much that goes on within this region. And I am happy to be able to have Alaskans hear about them firsthand today. So this is a real opportunity for us, and I hope you all appreciate that.

Now, before I offer brief opening remarks, I will take the opportunity to introduce our invited witnesses. We are privileged today to have Governor Sean Parnell join us this afternoon. Governor Parnell was elected to the State house of representatives back in 1992. He later went on to serve in our State senate. He was elected as Lieutenant Governor in 2008 and served with former Governor Sarah Palin, and then on July 26 of this year, Governor Parnell was sworn in as the 12th Governor for the State of Alaska. So I want to thank you and welcome you, Governor Parnell. I look forward to your testimony.

We are also extremely privileged this afternoon to have the Commandant of the United States Coast Guard, Admiral Thad Allen, who is with us. Admiral Allen is the 23rd Commandant of the

Coast Guard. He leads the largest component of the Department of Homeland Security comprised of nearly 90,000 men and women. Admiral Allen has a very illustrious background. He graduated from the U.S. Coast Guard Academy in 1971. His career has been filled with command both at sea and ashore. He has served as the commanding officer of Group Long Island Sound and captain of the port. He commanded Group Atlantic City and the Loran Station in the Kingdom of Thailand.

Throughout his 38 years of service, Admiral Allen has demonstrated great leadership and certainly tremendous ability to effect change. We saw that in the aftermath of Hurricanes Katrina and Rita. He served as the principal Federal official for response and recovery operations and was the Chief of Staff of the Coast Guard after the tragedy of September 11, 2001. He was also responsible for leading Coast Guard forces as the Commander of the Atlantic Area and the U.S. Maritime Defense Zone Atlantic.

Today Admiral Allen is leading the Coast Guard through significant modernization to better organize, train, equip, and deploy our men and women to meet the challenges of the 21st century. I thank you, Admiral Allen, and look forward to your testimony.

Our second panel this afternoon is comprised of our Alaskan experts. The first witness will be Mr. David Benton. David is the executive director of the Marine Conservation Alliance based out of Juneau. He has got over 25 years of experience in national and international oceans governance issues. For about 14 of those years, Mr. Benton represented the State of Alaska in international negotiations, and on national fisheries issues, he had a hand in negotiation of the majority of the international fisheries and oceans treaties that are enforced today in the North Pacific. Mr. Benton, it is a pleasure to welcome you here to the committee, and I might mention he has also served for 9 years on the North Pacific Fishery Management Council and was the first chair of the North Pacific Research Board which administers a comprehensive research program for the North Pacific, the Bering Sea, as well as the Arctic.

Next on our second panel is Dr. Lawson Brigham. Dr. Brigham is a distinguished professor of geography and Arctic policy at the University of Alaska, Fairbanks. He is also a senior fellow at the Institute of the North here in Anchorage and at the Scott Polar Research Institute in the United Kingdom. From 2005 to 2009, he was the chair and co-lead for the Arctic Council's Arctic Marine Shipping Assessment. He is a career Coast Guard officer. He served at sea and commanded four Coast Guard cutters, including a patrol boat. He has been on the Great Lakes icebreaker, a medium endurance enforcement cutter in the Atlantic, and the polar icebreaker, the *Polar Sea*. He has participated in many Arctic and Antarctic expeditions, including voyages aboard five different icebreakers.

Next on our panel is Mayor Edward Itta of the North Slope Borough. Mayor Itta was elected mayor in November 2005, has been reelected in 2008, and over the past couple of decades he has served in a variety of leadership positions for regional government. He is President of the Inuit Circumpolar Council in Alaska, the U.S. arm of the international organization representing the world's Inuit people. He is the present local government representative for

Alaska on the Outer Continental Shelf Policy Committee. He is past president and current member of the Barrow Whaling Captains Association and past commissioner and vice chairman of the Alaska Eskimo Whaling Commission and also a current member and an active whaling captain. It is a pleasure to have you with us this afternoon, Mayor Itta.

And the final member of the panel is Mead Treadwell. Mr. Treadwell is currently the Chairman of the United States Arctic Research Commission. Mead was appointed to the Commission in 2001 and was made chair by the President in 2006. Mr. Treadwell serves as a senior fellow at the Institute of the North, and he was previously with the Alaska Department of Environmental Conservation as Deputy Commissioner. He has represented the State of Alaska on U.S. delegations on three circumpolar government groups: the eight-nation Arctic Environmental Protection Strategy, the follow-on Arctic Council, and the Regional Governors Northern Forum. He is also a member of the board of the Alaska Science and Technology Foundation and on the board of the Prince William Sound Science Center and the *Exxon Valdez* Oil Spill Trustees Council's Policy Advisory Committee. So we welcome you, Mr. Treadwell.

We are holding this hearing this afternoon to learn more about the significant changes that are occurring in the far north and how the United States must prepare for an ice-diminished Arctic. We recognize that the Arctic is becoming more accessible due to a loss of summer sea ice and increases in technology, increased maritime activity relating to the transportation of goods, of oil and gas development, mineral extraction, tourism, as well as research, will demand new infrastructure and investment, as well as a greater presence in the region. So today's hearing will, hopefully, illuminate what some of these key issues will be.

We recognize that the United States is an Arctic Nation because of Alaska and the region has always had great strategic value to the United States. Arctic policy must recognize new developments, including the impacts and the effects of climate change and the impacts of increased activity within the region, the significant energy and natural resources that have been identified, a growing understanding of the significance of the unique natural environment, and an increased awareness of the geopolitical importance of the Arctic.

Now, I have recently introduced a couple bills in the Senate that will address some of the high priority needs that we have already identified. The first is based on recommendations of the Arctic Council's Arctic Marine Shipping Assessment. It is focused on developing maritime infrastructure. These include aids to navigation, port facilities, icebreaking escort, oil spill prevention and response, environmental monitoring, vessel tracking, and search and rescue capabilities.

The second bill that we have introduced authorizes funding to monitor coastal changes and to provide for safe navigation by mapping Arctic waters, including our extended continental shelf.

We are also working on the Federal funding for the refurbishment of one of our two existing heavy icebreakers in the Homeland Security appropriations bill. This recently passed the Senate. This funding will extend the service life of the *Polar Star* and allow it

to join the *Polar Sea* in active duty in the Arctic, but it is not a long-term solution. I think we recognize that we must do more when it comes to our icebreaking capacity.

The Arctic is unquestionably unique and the projections of an ice-diminished Arctic have profound implications for this region, its ecology, its environment, and its people. And how we address and adapt to these changes is truly the challenge and the opportunity that lie ahead.

Again, I want to thank all of our witnesses for your attendance and your testimony today, and for those of you who have joined us within the audience and online, I hear a little bit of feedback there, but I think we can deal with that.

With that, Governor Parnell, if we can start with your testimony, and I will state this to you and all of the witnesses. Your testimony will become part of the committee record. We ask that you summarize in any way but your full written statement will be included as part of the committee record.

So with that, we will begin with you and, again, thank you for your appearance here today and your service to our State.

STATEMENT OF HON. SEAN PARNELL, GOVERNOR, STATE OF ALASKA

Governor PARNELL. And thank you, Senator Murkowski. Thanks for hosting this field hearing in our State to address these important issues.

The changing Arctic and the national policies really must form the basis of a new national Arctic doctrine of sorts. My hope is that the discussion today will inform development of that doctrine.

Before I begin my remarks, Madam Chair, I too want to say thank you and recognize Admiral Allen of the U.S. Coast Guard and all the members of the Coast Guard and their families here in Alaska. Just this week, the Coast Guard helped save the lives of nine people in our State. And as I know you do too, we deeply appreciate the men and women who keep our coastline secure and our people safe. So I am here to say thank you as well to the Admiral and the members of the U.S. Coast Guard.

As you know and as you said, Senator, Alaska is America's Arctic. It is our home. It is our history, our heritage, and our future. And Alaska is the only national link to the Arctic. The Arctic's abundant resources, human and natural, our strategic location, these all demand our attention. The people of Alaska understand and we eagerly accept our role in the advancement of national and international Arctic policy. We worked closely with the previous administration on national and homeland security directives outlining broad policies on the Arctic. We look forward to working with this administration and this Congress in the same way.

So today I present Alaska's view of U.S. Arctic policies in five areas: our resources, national and homeland security, science, and foreign policy. In the Arctic, these policies are inextricably linked and must be acted upon jointly, and they have got to be discussed in the context of climate change.

So let me begin by focusing on Alaska's resources, most of all, our human resources, Alaska's people. And make no mistake. Alaskans have been adapting for years. Changes in the Arctic affect us directly every day, and no one is more vested in Arctic policy than

the people who subsist from the land, hunting, fishing, gathering, not just for food, but for survival of a culture. Collaboration with our Arctic residents is a must, and as Alaskans, we understand the need for that balance.

Any conversation about the Arctic must also include Alaska's natural resources, our gold, zinc, coal, natural gas, and oil among them. These resources make the Arctic vital to American energy security. Alaska is America's Arctic energy bread basket. We have traditional and renewable sources of energy in staggering volumes here, and Alaska can play an even greater role in reducing the amount of oil and gas we import from abroad. We can be America's test bed for renewable and alternative energy sources.

Offshore Alaska, the Beaufort and Chukchi Seas, those can be explored safely in the near term producing oil and gas for decades. Without these known traditional sources of energy, we risk higher-cost energy, higher taxes, and greater dependence on foreign oil. We can do this on our own soil. Let us not be led down the easy path to invest America's foreign aid dollars in exploration abroad. Let us keep it here. Let us keep it where Americans, where Alaskans can get the jobs and where environmental laws safeguard our land, seas, and wildlife.

Turning to cleaner fuels, the State of Alaska is pursuing the construction of a natural gas pipeline. We want to bring the North Slope's abundant, clean natural gas to America's markets.

We also remain fully committed to alternative and renewable energy. This is the place to field test every alternative. From wind turbines, to hydroelectric, to chip-fired systems that burn wood for fuel, Alaska is America's alternative energy center. I am confident that together we can bring traditional, renewable, and alternative energy to market and increase Alaska's contribution to our Nation's energy independence for years to come.

Now let us turn to homeland security. Alaska is America's Arctic guardian. Our strategic location, resources, our people, these all compel strong funding for homeland security purposes. The Department of Homeland Security and its agencies have been strong partners in providing for the safety and security of Alaskans and our economy.

The changing climate, diminished sea ice, as you have described, and increased military and commercial activity—these require a greater Coast Guard presence. So I am here to seek funding for a new Coast Guard duty station or port on Alaska's western or northern coast. They need to move north and improve their capability. To provide homeland security, the Coast Guard must have new Arctic class icebreakers. In addition, the Department of Homeland Security and the Federal Emergency Management Agency must have authority to prevent long-term disasters, and I am talking about those that we can predict before they occur. Erosion threatens our communities. The Federal law was not written with such hazards in mind and does not provide the large-scale response these small communities need.

So on to national security. As the summer ice retreats, opportunities for commerce, tourism, and transportation advance. As we have seen throughout the world's oceans, increased maritime traffic elevates both risks and threats. We can no longer assume that the

Arctic is an impenetrable barrier. Instead, we have got to take steps to protect our Nation's people and our economy, our energy infrastructure. Alaska's strategic position as the northern crossroads also places us squarely between potential adversaries and the rest of the United States. So I am urging the Congress to support the ground-based missile defense system in Alaska and reconsider the proposal to scale back the placement of interceptors at Fort Greely.

Turning to science, despite centuries of exploration and study, much about the Arctic remains a mystery. Standard weather and climate models are not sufficient for understanding and predicting trends and patterns. New models require fresh data and up-to-date research. The State of Alaska strongly supports the National Oceanic and Atmospheric Administration and its initiatives to improve its observations and research across the Arctic and to develop innovative models for forecasting weather. In the Arctic—this is something you can appreciate, Senator. The Arctic literally needs to be put on the map. Scientific research and economic exploration are set back by low-quality, decades-old mapping data. We need high-quality maps of the Arctic, both land and sea.

So turning now to foreign policy, for much of our history, the Arctic has been both ungoverned and ungovernable. Those days are over. Arctic nations have stepped up economic and military activity in the region. I am going to strongly urge the Senate to ratify the U.N. Convention on the Law of the Sea. Once ratified, the treaty will allow us to claim jurisdiction over the outer continental shelf behind the 200-mile limit. U.S. boundaries could grow into areas that may hold large deposits of oil, natural gas and other resources. Russia, Canada, Denmark, and Norway already have claims to Arctic territory, and we need a seat at the table.

Climate change. Alaskans know this land. We deal with it every day. Some of our residents deal with the changes in the Arctic ice every day. The timing, extent, and nature give us all cause for concern. To define and address these concerns, we have formed the Climate Change Subcabinet to respond to immediate needs in rural villages and plan for future needs as well. And the subcabinet has turned recommendation into action. We are now working on coastline stabilization, emergency and evacuation planning, hazard mitigation planning, and training and exercises for the communities that need help most. And I want to say thank you to our Federal partners for their help in this process.

PREPARED STATEMENT

So in conclusion, I just applaud you, Senator, for bringing this hearing to Alaska. These policies will have a profound effect on the Nation and on our State for generations. Alaska and the U.S. Government share a policy that is balanced and recognizes the diversity the Arctic offers. It highlights the Arctic's unique characteristics and consequent need for unique treatment. So I urge the Congress and the administration to continue the good work on Arctic policies. I encourage the development of a national Arctic doctrine that includes all stakeholders in the future of the Arctic. Alaska will participate and Alaska will contribute.

Thank you.

[The statement follows:]

PREPARED STATEMENT OF HON. SEAN PARNELL

Introduction

Thank you, Senator Murkowski, for this opportunity to address the Homeland Security Subcommittee of the Senate Appropriations Committee on one of the greatest challenges facing the Nation and the State of Alaska—the changing Arctic and the national policies necessary for its understanding, its protection, and its responsible development.

Before I begin my remarks, Madam Chair, I would like to take a few moments to recognize and thank Admiral Thad Allen, Commandant of the United States Coast Guard, and all the members of the Coast Guard for their bravery and hard work in Alaska.

Just this week, the Coast Guard helped save the lives of nine people in Alaska. A Coast Guard helicopter found two missing adults and a child near Ketchikan. With help from Alaska State Troopers, family and friends, the Coast Guard rescued another six people when a 20 foot pleasure boat overturned at Tee Harbor near Juneau. Unfortunately, one person lost their life in that incident. My thoughts and prayers are with his family and we deeply appreciate the men and women who keep America's coastlines safe and secure.

As you know Senator Murkowski, Alaska is America's Arctic—it's our home, our history, our heritage, and our future. And Alaska is the only national link to the arctic and the only state that shares a border with two other arctic nations. Arctic policies affect every state and every citizen—Alaskans most of all, not just because of our strategic location on the globe—but because of what we have to offer. The Arctic's abundant resources; human and natural, and our strategic location for national security demand our attention. The people of Alaska understand and eagerly accept our role in the examination and development of national Arctic policy.

We worked closely with the previous Administration on National and Homeland security directives outlining broad policies on the arctic. We hope to continue that collaboration with this Administration and Congress.

Today, I present Alaska's view of U.S. Arctic policies in five areas: Resources, national and homeland security, science, and foreign policy. In the Arctic, these policies are inextricably linked. And, while I describe these issues individually, it is vital that this committee and the administration understand and act on them jointly. Domestic energy supplies support national and homeland security. Security enables development and protects the environment. Foreign policy enables international participation in scientific research. This must all be discussed in the context of climate change and how Alaska is adapting in light of Arctic policy.

Resources

Let me begin by focusing on Alaska's resources—most of all, our human resources—Alaska's people. Make no mistake, Alaskans have been adapting for years. Changes in the Arctic affect us directly, every day. No one is more vested in Arctic policy than the people who subsist from the land—hunting, fishing and gathering, not just for food, but for the survival of their culture. Collaboration with our Arctic residents and local governments, is a must. Alaskans understand the need for balance.

Any conversation about the Arctic must also include Alaska's natural resources—coal, gold, zinc, silver, copper, natural gas and oil. These resources make the Arctic vital to American energy security. Alaska is America's Arctic energy breadbasket. We have traditional and renewable sources of energy in staggering volumes here. Alaska can play an even greater role in reducing the amount of oil and gas we import from abroad. And we can be America's test-bed for renewable and alternative energy sources.

The onshore Arctic areas, such as the NPR-A and the coastal plain of ANWR, hold great promise.

Alaska is home to the Trans Alaska Pipeline System, which carries 685,000 barrels of oil a day to the lower 48 States. This major supply of oil is key to our national energy security.

Offshore Alaska, the Beaufort and Chukchi Seas, can be explored safely in the near-term, producing oil and gas for decades. Without these known, traditional sources of energy, we risk higher cost energy, higher taxes, and greater dependence on foreign oil. We can do this on our own soil. Let us not be led down the easy path to investing America's foreign aid dollars in exploration abroad. Let's keep it here—where Americans can get the jobs, and where environmental laws safeguard our land, seas, and wildlife.

Putting the brakes on domestic energy production does not prevent global warming or end threats to species. Instead, delaying responsible exploration and development increases the problem by shifting resource extraction to less environmentally preferred fuels and locations.

Turning to cleaner fuels, the State of Alaska is also pursuing the construction of a pipeline to bring the North Slope's abundant, clean natural gas to American markets. We have two competing private sector groups working diligently to permit a natural gas pipeline that can deliver 4.5 billion cubic feet of natural gas a day to the continental United States. Again, if we can turn on the supply of clean, American natural gas—from Alaska—we will reduce our dependence on imports and bring less expensive energy to homes across America.

Unfortunately, current language in proposed climate change legislation would likely make the project uneconomic and would lead to the use of higher cost fuel sources before technology catches up.

Alaska remains fully committed alternative and renewable energy, as well. This is the place to field test every alternative. From wind turbines, to hydro-electric, to chip-fired systems that burn wood for fuel—Alaska is America's alternative energy center.

I am confident that together we can bring both traditional, renewable and alternative energy to market and increase Alaska's contribution toward our Nation's energy independence for years to come.

Homeland Security

Alaska is America's Arctic Guardian. Our strategic location, resources and people compel strong funding for homeland security. The Department of Homeland Security and its agencies have been strong partners in providing for the safety and security of Alaskans and our economy.

Melting sea ice and increased military and commercial activity require a greater Coast Guard presence. The Coast Guard needs to move north and improve its capability—our heavy ice-class icebreakers are on their last legs. To provide homeland security—the Coast Guard must have new Arctic-class ice breakers equipped for search and rescue missions, border protection, law enforcement, fisheries enforcement, infrastructure and environmental protection.

Support for funding for those icebreakers is up to this committee. We need to fund a new Coast Guard duty station or port on Alaska's coast between Nome and Barrow to meet the new challenges of the Arctic.

The Coast Guard needs to keep the promise of the Oil Pollution Act of 1990 and establish a research program for the Arctic. With information in hand, we can continue to work with the Coast Guard to improve our ability to prevent and respond to oil spills in the region.

In addition, The Department of Homeland Security and the Federal Emergency Management Agency must have authority to act on disasters we can predict, not just those looming around the corner or the one we currently face. In western and northern Alaska, the sea ice no longer shields the coast from fall storms. The resulting erosion threatens the sustainability of some communities. The Federal law was not written with such hazards in mind and does not provide the mount the large-scale response these small communities need.

Exploration and development will bring more coastal and maritime infrastructure such as ports, repair facilities, fuel depots, pipelines, and transportation. These assets will need effective, enforceable security buffer zones to ensure continuity under all hazards.

National Security

As the summer ice retreats, opportunities for commerce, tourism and transport advance. Already we see more mineral, oil and gas exploration—more vessel traffic and science missions. As we have seen throughout the world's oceans, increased maritime traffic elevates both risks and threats. Currently, the North Slope Borough and oil and gas producers on the slope, fill much of that void. We need the Federal Government to step in. We can no longer assume that the threat from the north to our oil production fields is not real. We can no longer assume that the Arctic is an impenetrable barrier.

The United States must increase national focus on the Arctic, add resources to collect scientific data, and increase Coast Guard presence to address these new challenges and opportunities. This will provide the ability to develop the American Arctic's vast natural resources and is critical for the protection of strategic national infrastructure and assets.

Alaska's strategic position as the northern crossroads also places us squarely in line between potential adversaries and the rest of the United States. I urge the Con-

gress to support the ground-based missile defense system in Alaska and reconsider the proposal to scale back the placement of interceptors at Fort Greely. We play a critical role in national security and in the security of American allies.

Science

Despite centuries of exploration and study, much about the Arctic remains a mystery. Standard weather and climate models are not sufficient for understanding and predicting trends and patterns. New models require fresh data and up-to-date research.

The State of Alaska strongly supports the National Oceanic and Atmospheric Administration and its initiatives to improve its observations and research across the Arctic and to develop innovative forecasting models for next week's weather and next century's climate.

I encourage scientific collaboration among the academic world, the Arctic nations, and non-governmental organizations to improve our understanding of fisheries, marine mammals, land animals and vegetation in the Arctic ecosystem. This research must be open and rigorous.

The State continues its support of the use of unmanned aerial systems for Arctic operations and research. The Alaska Aerospace Development Corporation and NOAA are working on a plan for how best to make that happen. The technology exists; the stakeholders are ready; but the current regulations are inflexible and outdated.

And the Arctic, literally, needs to be put on the map. Scientific research and economic exploration are set back by low quality, decades-old mapping data. There is no accurate baseline to measure change, to identify trends and patterns, or predict potential outcomes. We need high quality maps of the Arctic—both land and sea. Funding for such priorities should not be based on population density, but instead on current and future strategic economic and environmental values.

Foreign Policy

For much of its history, the Arctic has been both ungoverned and ungovernable. Even as the eight Arctic nations have increased economic activity, the Arctic climate has impeded economic and social development, transportation, and research. That era must end.

I strongly urge the Senate to ratify the United Nations Convention on the Law of the Sea. Once ratified, the treaty will allow us to claim jurisdiction over the offshore continental shelf behind the 200-mile limit. U.S. boundaries could grow into areas that may hold large deposits of oil, natural gas and other resources. Russia, Canada, Denmark, and Norway have claims to Arctic territory under the auspices of the Law of the Sea. Without ratification, the United States cannot fully participate in adjudication of these claims.

Climate change

Alaskans have extremely close ties to the land and the sea and are sensitive to their subtleties and variability. The changes in the Arctic ice—their timing, extent, and nature—give us cause for concern.

To define and address these concerns, Governor Palin formed the Climate Change Subcabinet to respond to immediate needs in rural villages, plan for the long term and determine research needs and the sub-cabinet has turned recommendation into action. We're now working on coastline stabilization, emergency and evacuation planning, hazard mitigation planning, training and exercises for the communities most in need.

The Climate Change Strategy is in the final stages and will be presented to me this fall. We've had noteworthy partnerships with several Federal agencies in this process, and we look forward to continued work with the Federal Government as we address climate change.

Conclusion

In conclusion, I applaud you, Senator Murkowski, on bringing to Alaska this hearing on the strategic importance of the Arctic in U.S. policy. These policies, whether long-standing or emerging, will have a profound effect on the Nation and on Alaska for generations. We must take a balanced approach to protect our food sources, thousands of jobs and the energy security provided by Alaska's oil and mineral development.

Alaska and the U.S. government share a policy that is balanced and recognizes the diversity the arctic offers. And it highlights the Arctic's unique characteristics and consequent need for unique treatment.

I urge the Congress and the Federal Administration to continue the good work on Arctic policies and encourage the development of a National Arctic Doctrine that

includes all stakeholders in the future of the Arctic. Alaska will participate and Alaska will contribute. We are eager to work with Congress to manage all our resources.

On taking office last month, I asked Alaskans and myself several questions: In the next 50 years, will Alaska move forward, or will time pass us by? Will each of us be a vital player, or will we stay on the bench? Will we just survive, or will we choose to thrive?

Today Alaskans join me in stating that our state—and our nation—must not be idle and passive; that we must not drift; that we must choose our destiny and work hard, as well, to achieve it.

The Arctic is our future. We choose to move forward, and we choose to thrive.

Thank you for your leadership and your service to our great State and to our Nation

Senator MURKOWSKI. Thank you, Governor. I appreciate your comments and not editorializing, because I do want to make sure that we have got time for questions from the full panel, but I appreciate your singling out what we in Congress can do in terms of advancing the Law of the Sea Treaty. I think we recognize that for purposes of just identifying that which we believe rightfully should be ours is important. And until we sign on and we ratify the Law of the Sea Treaty, we are at a disadvantage, but we are also at a disadvantage if we fail in our own mapping efforts. I know those of you who have been looking at this recognize that when we do not know what is out there, it puts us at a distinct disadvantage. So a couple points there.

I wanted to ask you specifically. You have mentioned the national Arctic policy or directive and have indicated your support for that effort and the State's willingness to certainly be a participant. Do you believe that the State needs to have its own Arctic policy? Or how do we mesh the initiatives at the State level with what we advance from a national perspective?

Governor PARNELL. I think inherently Arctic policy is a national and international undertaking which effectively resides with the Federal Government. I think, though, that because our people and our State are impacted by that Arctic policy, I think the State deserves and needs a seat at the table. So my hope is to be an active participant as a State and as individuals in the State in development of that Arctic policy.

Senator MURKOWSKI. A couple of different things that are going on at the State level. You have mentioned the Climate Change Subcabinet and the fact that they have reported out with a series of recommendations. You have also mentioned the work that is going on with coastline stabilization and the efforts there. One of the things that I think we appreciate is that as we see erosion continue and continuing at an accelerated level in certain areas, it is more than just putting some additional riprap in. It is significant work. It is expensive to do. And at the Federal level, we are grappling with how we move forward with such an extensive initiative. I was able to recently restore the reauthorization that is necessary for the Army Corps of Engineers, the authority to make sure that they can move forward with that.

But this is an area where I think from both the State and the Federal perspective we have got a lot of work to be doing together, and I would like just your feedback on how we can both be working to provide for a level of security and protection.

Governor PARNELL. I think we can do it in several ways, and I think we are doing it. One, I said that Alaska wants to participate and contribute, and I think we are full-on partners in that. So, for example, within the last year and a half, the Governor's office had requested about \$24 million from the legislature for coastal erosion stabilization efforts. The legislature appropriated about \$15 million of that request. So we are a financial partner in the effort. When it comes to individual communities, we are working hand in hand with Federal agencies to get the job done to protect our communities, and I think you are going to see that continue.

Senator MURKOWSKI. I have actually got an opportunity to go out tomorrow to Newtok to see how we are helping to move a community. I think one of the beautiful examples that we have with Newtok is it is a community that has taken initiative, but they are working with all of the different partners to help facilitate. The military is helping with the emergency evacuation. The State is a participant. The Feds are a participant. Everyone who is a stakeholder is engaged and is involved in really telling a good story with Newtok.

Governor PARNELL. Senator, can I just expound on that just for a moment?

Senator MURKOWSKI. Certainly.

Governor PARNELL. I think that is a wonderful example of Federal coordination, and we are grateful to the U.S. marines, the U.S. Navy for participating in that effort with us, with the Federal and State government, as well as working very closely with the local residents on that move.

I also want to point out that it does not necessarily take a relocation effort. Sometimes these challenges look bigger because we take them in big chunks by saying we have to move a village. And that may be true over time, but we can also take significant steps to protect the life and safety of our residents. So, for example, with another village that is threatened by erosion, we might work together on an evacuation route, a road out of the village inland so that they can have safety from the weather. That, in turn, will lead to perhaps a new school, which in turn will draw village residents to a different location. So if we can work together to take these large problems, break them down into manageable sizes, and work together with the communities, I think we will have a win-win together.

Senator MURKOWSKI. Appreciate it. Thank you for your testimony, Governor. Thank you for being here today. We look forward to working with you on these issues and so many more.

With that, I would ask you, Admiral Allen, to join us at the table.

And for those of you that are on the line—I believe it is just various media outlets—I would ask you to please put your microphones on mute. We are picking up a lot of feedback and it is quite disruptive. So if you can all check your mute buttons and be quiet.

Make sure you have got something that works there, Admiral. If you would please go ahead. Again, thank you and welcome.

STATEMENT OF ADMIRAL THAD W. ALLEN, COMMANDANT, U.S. COAST GUARD

Admiral ALLEN. Well, thank you very much, Senator. I do have a statement for the record. I would like to submit that and would make some opening comments. I actually had prepared an oral statement within the 5 minutes, but I thought it might be more instructive to tell you what I have done this week.

Senator MURKOWSKI. Great.

Can I just ask again, those of you that are on the line to please make sure that your microphones are off. We are still picking up feedback. We will see if that gets it. Thank you, sir.

Admiral ALLEN. Thank you, ma'am. Also, I want to thank you for two things. Number one, it is 92 degrees in Washington today. I am glad to be here.

Senator MURKOWSKI. We are glad to have you.

Admiral ALLEN. I believe this is the first hearing I have ever done in my operational duty uniform. I just flew in from Dead Horse, so thank you for that as well.

I left Washington on Monday morning. I come to Alaska every summer, mostly in August, to see how our forward-deployed personnel are doing on the North Slope. And this is our third year of doing that. This year, I thought it would be good to take a "whole of government" approach in doing that, and so while they are not here with me—they are fanned out across the State as we speak—I took with me on the plane Dr. Jane Lubchenco, the Administrator of NOAA and Under Secretary of Commerce. We had Deputy Secretary David Hayes from Interior and Nancy Sutley, Chairman of the Council on Environmental Quality, and Heather Zichal, who is the Deputy Advisor to the President and works for Carol Browner focusing on climate and energy issues.

We flew into Nome and met with Mayor Michaels. We got on three helicopters and flew up to the village of Shishmaref. I met with the mayor there. We looked at the coastal erosion and the impact of climate change on that village, and you have just discussed that with the Governor here.

One of the reasons we went there is that this summer we decided to make a difference in the forward deployment. We reached out to the communities and said, "What do you need from us? We provide access. We bring people, and we bring equipment up here. Is there something else we could be doing?" And we found out there are some things we could be doing at very low cost that would have a significant impact on the communities.

In combination with our other services—this includes the Army, the Air Force, the National Guard, the Air Guard and the Navy—we have deployed medical teams to take care of dental work to help with the clinics. Our big surprise is the amount of popularity we have had for bringing veterinarian services to the North Slope especially in taking care of some issues related to rabid foxes and the dogs and the animals that are so important to our communities up there. It was clear to us that this is resonating, and it is clear to us that for a very small amount of money, you can leverage the resources you have and have a very large impact.

We left Nome and went to Fairbanks and got a briefing from the University of Alaska at Fairbanks on changes in climate, some of

the studies that are going on there, and the great work that is happening there.

I had a chance myself to go out to Fort Greely. I looked at the ground-based missile interceptors and had a great conversation out there. The Coast Guard is involved in that work regarding the sea-based X-band radar and some of the work that is going on down at Kodiak. So that really helped to fill my knowledge out.

We then went up to Barrow. We met with Mayor Itta, the elders, and the Alaska Eskimo Whaling Commission and looked at the issues up there. Again, we saw the immediate feedback from putting veterinary services and other services up there in the summer.

I was over at Dead Horse this morning. I am down here right now.

As you know, for the past three summers, we have moved forces to the North Slope. We know—and I like your term “diminished ice.” There is always ice somewhere up there, ma’am, and we all know that. I am sure it is not appreciated elsewhere. We have had deployed forces up there for 3 years in a row, and we are learning. We are in the process of doing a northern latitude requirements study in the Coast Guard right now; the first phase of which will be done later on this year. Some things we are learning are that our traditional small boats do not operate well off the North Slope as far as launching and recovery, and we have much to learn from the Eskimo natives that operate up there, and we are talking with them every summer. We have long-range communications problems with our helicopters because of the lack of infrastructure, especially in high frequency nets, which we have to use to communicate and assure our assets are being safe. And as has already been stated, there are navigational challenges up there because there is lack of mapping data, and Automatic Identification System navigation is an issue moving forward, too.

We continue to refine what we need to do up there. We will continue to deploy and operate up here every summer. I think the real question before us, as the Governor and everybody whom I have talked to has alluded, is: How do we transition from mobile deploying forces, seasonally to making a better footprint up there, not only for ongoing operations year round but to surge if something were to happen up there. With the increased shipping and use of the Arctic waters up there, whether it is ecotourism, increased traffic-related oil or gas exploration, we need to be able to carry out the responsibility the Coast Guard has in the Lower 48 regarding law enforcement, search and rescue, environmental response, and so forth.

We hope sometime in the next 6 months to start putting together a requirements document that will generate what we really need to operate up there. We know that on the water, our small boats are not what is needed up there. Some other vehicle, whether it is an air boat, a hover craft, or something we are going to have to look at to be able to provide the right access and be able to operate on the water up there. Again, the type of helicopter and the communications are going to be an issue as well.

If I was to summarize the Coast Guard’s view of the Arctic and the strategic issues associated with that, I would probably give you four issues, ma’am.

The first one has already been alluded to, and that is to maintain our current capability so we do not erode our ability to respond to an incident that occurs up there. Right now, as you know, there are three icebreakers in the Coast Guard inventory, and that is America's inventory. One is an ice-strengthened research vessel, the Coast Guard cutter *Healy*, which is deployed as we speak to collect data for a potential claim beyond the continental shelf when we ratify the Law of the Sea Treaty.

However, we have one icebreaker that is operational, the *Polar Sea*. The *Polar Star* has been laid up, and we are currently going through an evaluation of that to complete repair as we have been appropriated about \$30 million. The ship was dry-docked recently, and we are generating a work list. It should be done sometime in the next 4 to 6 weeks. That will allow us to proceed and tell us what needs to be done. And as you have noted, the Senate has added \$32 million in its appropriations this year.

I have been asked several times what would it take to put the *Polar Star* back in operation, and the answer is the combination of those 2 foot mounts and about \$62 million. And it would take time to make a long-term decision about where we need to go with icebreakers.

We are not presupposing a decision to build icebreakers. What we need to do is to build a valid set of requirements based on better knowledge of what is happening up there, but in the meantime, our goal is to maintain current readiness and not let that degrade any further than it has.

The second issue for us, as I have already alluded to, is to engage with our native partners up there and conduct operations. We will be up there in the summers. That will be for the foreseeable future. And then the goal is to transition to whatever we need to do after that. I say whatever we need because I think those requirements need to be solidified, but we should not take too long to do that. I think the next 6 to 12 months should tell us something about that.

The third issue would be, without being too glib, we need a "whole of government" approach rather than a "whole in government" approach, rather than working by ourselves, digging out of our own holes. It is nice to be up here with all our partners traveling around the State, but it is also nice to see the various services out there operating together. Collectively with small contributions, they are generating tremendous, tremendous return on investment up there not only for us in terms of experience and making our people better leaders and better technically skilled people but also because of some of the invaluable services they bring to the people up there.

PREPARED STATEMENT

And the fourth issue, as I have alluded to already, would be to generate solid mission requirements, based on data, to understand what it is we need to do up there in terms of effects. We can talk about a forward station. We can talk about a helicopter, but what we really need to do is to be able to respond to a search and rescue case, deal with an oil spill and deal with emerging homeland security or law enforcement issues up there, and I think we need to fig-

ure out what capability it is going to take to do that without presupposing the outcome. We will generate the right requirements, and hopefully at that point we will gain the support and the resources we need to effect that.

I want to thank you again for having us here, ma'am, and thank you for your continuing support. And I would be happy to answer any questions.

[The statement follows:]

PREPARED STATEMENT OF ADMIRAL THAD W. ALLEN

Good afternoon, Senator Murkowski. I'm pleased to be here today to discuss the Coast Guard's Arctic presence.

ICEBREAKING CAPACITY IN THE ARCTIC

Just over a year ago, I testified before Congress on Coast Guard icebreaking. I stressed the importance of maintaining our Nation's ability to project maritime presence and strength throughout the world, and specifically the Arctic region. In the past year, arctic policy was further defined by National Security Presidential Directive (NSPD) 66/Homeland Security Presidential Directive (HSPD) 25 on Arctic Region Policy. This Directive provides specific policy objectives while acknowledging the effects of climate change and increased human activity in the Arctic region. In executing this direction, we must be prepared to address the impacts of more open water, an increasing population of maritime users operating in a fragile and challenging environment, and assertion of claims to the vast natural resources of the region. The Coast Guard, through the Department of Homeland Security and with the Departments of State and Defense must work to improve maritime domain awareness, preserve the global mobility of United States military and civilian vessels and aircraft, and project a sovereign United States maritime presence in the Arctic region.

To that end, the Coast Guard has continued expansion of its operations in Arctic waters during open water periods while also ensuring its multi-mission capacity is available to support execution of Coast Guard responsibilities year round. As you know, the Coast Guard has three polar icebreakers, two of which are currently operational. The HEALY, a medium icebreaker, is capable of all Arctic operations and is specifically adapted for scientific research. She is currently operating in the Arctic conducting hydrographic mapping of the U.S continental shelf. *Polar Sea*, which is one of our two heavy icebreakers, is capable of all operations in the Arctic and Antarctic regions. She will conduct an Arctic West Patrol early this fall to support national science missions. The Coast Guard's third icebreaker and other heavy icebreaker, *Polar Star*, is not operational since being placed in "caretaker" status in 2006. *Polar Star* recently came out of dry dock in Seattle as part of ongoing engineering assessments being conducted as part of the project funded in the 2009 Appropriations Act. These three ships represent our Nation's current icebreaking capacity in the Arctic region.

ARCTIC TRENDS

The Arctic environment is dynamic. Observations and trends have been reported that could increase the intensity of our operations and impact our access requirements:

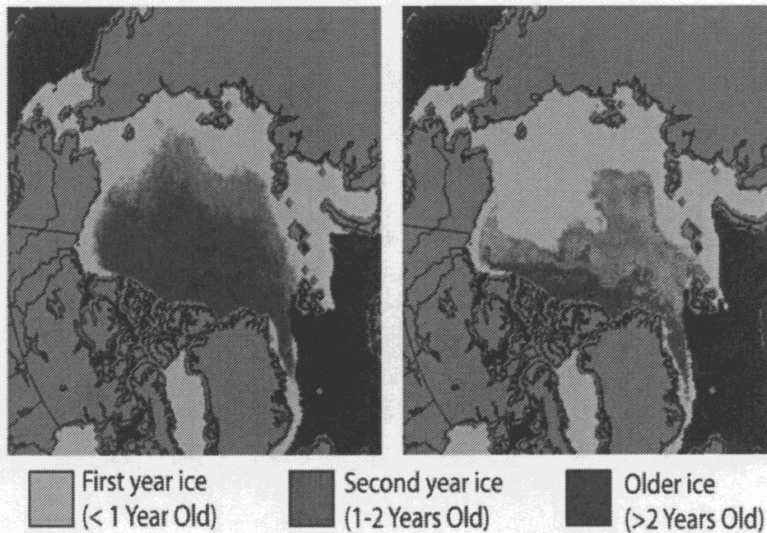
- Dynamic Changes in Ice Conditions.*—The steady recession of the ice edge continues to open new water in the summer months. As such, dangers to shipping may increase because of the dynamic and unpredictable movement of ice.
- Expanding Resource Development.*—Based on assessments by the U.S. Geological Survey, there have been projections that an estimated 22 percent of the world's oil and natural gas could be located beneath the Arctic with some portion of undiscovered, technically recoverable resources located within the U.S. Exclusive Economic Zone (EEZ). Reflective of this value, oil companies bid nearly \$2.7 billion for Chukchi Sea mineral rights.
- Eco-tourism.*—This industry continues to expand as cruise ships, carrying hundreds of passengers, test the limits of safe navigation in Arctic waters. To date, we have already observed an increase by one in the number of adventure cruises from last year's for Northwest Passage Transits. Two cruise ships recently transited the Northwest Passage, one from the east and one from the west with 164 and 184 passengers respectively.

- Fish Stock Migration.*—As the ice edge recedes and water temperatures change, the North Pacific Fishery Management Council reports an increase in fish stocks being caught to the north. As a result, fishing vessels have been observed moving further north, which could lead to increased foreign incursions into the U.S. EEZ.
- Sovereignty Claims.*—With the increased level of open water comes more ability to research and map the oceans floors. This research, including hydrographic surveys and bottom sampling may serve as precursors to international sovereignty claims to extended continental shelves pursuant to the Law of the Sea Convention.

End of February Arctic Sea Ice Age

1981-2000 Median

2009



NATIONAL ARCTIC POLICY

The United States is an Arctic nation. As the ice edge continues to recede in the summer, the extent of navigable waters increase. As we adjust to this dynamic, it is critical to recognize the Arctic Region as environmentally fragile, rich in natural resources, and of significant national importance and international interest. We must be prepared to meet current and future demands. The objectives established in the Arctic Region Policy include:

- Meeting national security and homeland security needs relevant to the Arctic Region.
- Protect the Arctic environment and conserve its biological resources.
- Ensuring natural resource management/economic development are sustainable.
- Strengthening institutions for cooperation among the eight Arctic nations.
- Enhancing scientific monitoring and research into environmental issues.
- Involve the Arctic's indigenous communities in decisions that affect them.

As Commandant, I believe the the Coast Guard's eleven statutory missions may have a significant role in supporting many of the objectives established in NSPD-66/HSPD-25.

Additionally, the multi-nation Arctic Marine Shipping Assessment (AMSA) published in April 2009 provided a comprehensive assessment of the current uses and future impacts of increased accessibility and maritime activity in the Arctic. The report concluded that safe, secure, and environmental sound maritime commerce in the Arctic region will depend on adequate infrastructure to support shipping activity, search and rescue capabilities, short and long range aids to navigation, high-

risk area vessel-traffic management, iceberg warnings, shipping standards, and comprehensive measures to protect the marine environment.

SUPPORTING EXECUTION OF THE NATIONAL ARCTIC POLICY OBJECTIVES

One thing is certain today regarding the Arctic, there is more navigable ocean during summer months where there used to be ice, and the Coast Guard has statutory and regulatory responsibilities in that ocean. The Coast Guard is the Nation's primary maritime safety, security, environmental protection and law enforcement agency. As such, we hold a significant responsibility in executing the Arctic Region Policy. In order to better perform our anticipated role, we are developing an Arctic Strategic Plan (ASP) to ensure the Coast Guard is both prepared and able to engage and conduct statutory operations in the Arctic. From my perspective, in addition to our existing mission demands, the Coast Guard must actively participate in the multi-agency effort to address current and future challenges associated with the Arctic.

Meeting Homeland Security Needs in the Arctic

As part of a multi-agency effort to implement the Arctic Region Policy, we continue to push forward and assess our Arctic limits. In the summer of 2008, we established Forward Operating Locations (FOL) on the North Slope. We employed Coast Guard small boats, helicopters, and Maritime Safety and Security Teams (MSSTs) in Prudhoe Bay, Nome, and Barrow to increase maritime domain awareness and test capabilities in the Arctic environment. We will continue those efforts later this summer, when there is the most open water, by redeploing Forward Operating Location bases in most of the same places. Currently, these FOLs operate on a limited basis due to weather conditions, distances, and a lack of shore based infrastructure. We will institute changes based on lessons learned last year, as we continue to develop and refine our knowledge base on operations in the Arctic.

To evaluate activity trends in the Arctic, the Coast Guard commenced extensive Arctic Domain Awareness flights. Coast Guard C-130 Flights originated out of a temporary Forward Operating Location in Kotzebue last summer and will continue later this summer. These flights help develop a complete awareness of all private and governmental activities in the Arctic.



Coast Guard Small Boat at a Forward Operating Location in September 2008

Protecting the Maritime Environment

To help protect the critical, pristine and fragile environment of the Arctic Region, we must continue to support pollution response capabilities in the region. Recognizing that oil spill clean-up is significantly more difficult in colder temperatures

and ice-covered waters, enhancing prevention measures is even more critical as a means to mitigate risk. Moreover, the combination of a harsh environment and limited response resources and capabilities necessitates that awareness, contingency planning, communications amongst stakeholders are effective and efficient.

While prevention is critical, so is response capability. We continue to exercise the vessel of opportunity skimming system (VOSS) and the Spilled Oil Recovery System (SORS) in the Arctic. Both of these systems enable vessels to collect oil in the unfortunate event of a discharge. The VOSS is deployable and capable of being used on a variety of ships and the SORS is permanently stored and deployed from the 225 buoy tenders. The VOSS has been exercised in the Arctic on the *Polar Sea* and the SORS will be exercised on SPAR later this summer.

To better understand the impact the northward movement of fish stocks into the Arctic will have on sustainability, a regional management plan is needed. The North Pacific Fisheries Management Council imposed a moratorium on fishing within the U.S. EEZ in the Arctic until assessment of the practicality of sustained commercial fishing in the region is completed. Regardless of the outcome of the assessment and follow-on management plan, it is certain the Coast Guard will play a critical role in its enforcement.



POLAR SEA deploying the Vessel of Opportunity Skimming System (VOSS) in Arctic Waters.

Facilitating Safe, Secure, and Reliable Navigation

With the deployment of the Coast Guard buoy tender SPAR to the Arctic last year the Service began an in-depth Waterways Analysis Management Survey (WAMS). This ongoing survey applies criteria described in the AMSA to assess safe shipping routes, aids to navigation, and vessel routing and traffic system requirements in the Arctic.

Supporting Multi-Agency Arctic Region Policy Implementation

Strengthen Cooperation's Among the Eight Arctic Nations

The Coast Guard continues to support international and multilateral organizations, studies, projects, and initiatives. Some key groups, projects and legal frameworks include the Arctic Council, AMSA, Ilulissat Declaration (2009), and the U.N. Convention on the Law of the Sea (UNCLOS), to which the United States has not yet acceded. In April 2009, Coast Guard District Seventeen and the Canadian Coast Guard held a Joint Maritime Pollution Contingency Plan Table Top Exercise for oil spill responses in the Beaufort Sea. Consistent with such efforts, the Coast Guard

will continue to engage Arctic Nations and international organizations to identify and meet current and future challenges associated with the Arctic.

Involve the Arctic's Indigenous Communities in USCG Decisions That Affect Them

Some of our biggest successes and lessons for the way forward have come from our continued engagement with Alaska Native Tribes. Their knowledge, assistance and collaboration have been invaluable to our safe operations and initiatives. For instance, we conducted boating safety exchanges and provided medical and dental outreach programs while operating in remote villages on the North Slope. We will continue to focus on working with these groups, while ensuring their equities are recognized and protected, as we adapt to the challenges associated with changing operations in the region.

Enhance Scientific Monitoring and Research into Environmental Issues

The Coast Guard continues to support the Arctic research efforts of the scientific community through ongoing operations onboard the CGC *Healy* and *Polar Sea* this summer. These missions will support the Naval Research Lab, National Science Foundation, Office of Naval Research, and the Department of State to continue mapping of the continental shelf. Additionally, Air Station Kodiak has and will continue to provide scientific research support from its C-130s through deployment of data buoys in the Arctic.

NATIONAL ARCTIC CAPACITY

While our summer operations continue to provide valuable lessons and help us gain better insight regarding the Arctic, we must acknowledge the seasonal limitation of these efforts. When summer season commercial activity expands, mariners will test the boundaries of safe navigation, and as the five Arctic nations continue to collect data to make jurisdictional claims, it is important to maintain an appropriate presence in the Arctic for law enforcement and response purposes with vessels capable of accessing the region. The expansive distances, severe weather conditions, and lack of land-based infrastructure continue to challenge our capabilities.

As established by NSPD-66/HSPD-25 and noted previously, the Coast Guard has jurisdiction and statutory mission requirements over Arctic waters and the demands associated with those obligations will increase as waterways continue to open. Future mission requirements for this vast, remote, and exceptionally harsh environment are still being studied. The full multi-agency missions and asset gaps for the future have yet to be determined.

In order to better understand our future roles, requirements, and gaps in both the Arctic and Antarctic, we are conducting a High Latitude Study, an in-depth mission analysis report. The results, which will be available in the summer of 2010, will allow us to better understand our mission needs in the Arctic, ensure we are better positioned to fill the critical roles through a comprehensive Arctic strategy to include a mix of assets and other resources.

COAST GUARD ICEBREAKER ASSETS

The *Healy*, commissioned in 2000, has an expected service life of 30 years. The *Polar Sea* and *Polar Star* were both commissioned in the late 1970s, and are fast approaching their extended service lives of 30 years. The *Polar Sea* had a significant 2-year refit in 2006, extending its service life to 2014.

We are currently engaged in a \$30.3 million project on the *Polar Star*. Independent engineering assessments are being completed now, including completion of a brief dry dock in May, to ascertain the extent of work required to continue with this major overhaul. Extending *Polar Star's* service life could provide additional backup capacity for *Healy* and avoid a heavy icebreaking capacity gap when *Polar Sea* reaches the end of its already extended service life. However, the cost of this additional capacity, including the expense to operate and maintain both *Polar Sea* and *Polar Star*, must be weighed against the costs and benefits of other backup capacity options.

Budget authority for the Coast Guard's polar icebreakers currently rests with the National Science Foundation (NSF) and has since being transferred in 2006.



HEALY operating in the Arctic

CONCLUSION

The Arctic is a vast and challenging environment going through significant changes. The unique nature of the region, magnitude of open water, and new users are leading to increased challenges to National sovereignty. As a Nation, we now have an Arctic Region Policy and the Coast Guard has a significant role in implementing that policy. We are pushing forward to meet our responsibilities using the resources available right now.

To meet our national responsibilities in the Arctic, we must ensure we are prepared for the challenges associated with this unique and harsh environment. While we work to refine future mission requirements and identify the precise mix of assets needed to perform them, Coast Guard icebreakers stand ready to meet our current icebreaking needs in the Arctic.

Senator MURKOWSKI. Well, thank you, Admiral.

Let me ask you this. We recognize that the existing infrastructure up north is limited at best and nonexistent in some cases. You have indicated that the goal here is to generate solid mission requirements, to use your terminology, to really understand what the requirements are first before we act. Did I understand that you ought to know this in about 6 months, that there will be a requirements document?

Admiral ALLEN. We have initiated a high-latitude study that will be in three parts. The first part is going to focus on the current requirements for icebreakers. The second will be future requirements, and the third will look at forward operating from the Northern Slope.

To give you an example, if I could just pick a few places, there are three places where we can get very large aircraft to go further north, and we have been conducting Arctic domain awareness

flights with our C-130 aircraft up to the ice edge and even further. We can fly out of Nome, we can fly out of Barrow and we can fly out of Dead Horse. They differ radically in the amount of logistical support that is available and our ability to bring numbers of people in and operate from there.

So we would have to make a decision on where the need is and the requirement where you want to operate from. A helicopter in Nome might not do you any good for an event off Point Barrow and vice versa, and so we need to figure out where the risks are, what we want to achieve and what best accomplishes that. And then we need to look at the infrastructure that is available and how we would move people in to conduct command and control and be able to generate the type of effects we want offshore.

Senator MURKOWSKI. Well, we have had an opportunity to talk about the geographic reality that when you have got your assets located down in Kodiak and you need to move something up north somewhere around the Chukchi, that is a heck of a long haul.

Admiral ALLEN. Yes, ma'am.

Senator MURKOWSKI. And yet basing them, whether it is a helicopter or otherwise, in an area where you do not have a hangar facility where you do not have runways that you need, where you do not have harbor for the boats, we are talking some pretty basic infrastructure needs. Is that correct?

Admiral ALLEN. Yes, ma'am. If I could use an example. There is an extraordinary amount of work being done in Nome by Mayor Michaels. They have extended the jetties, as you know, out there, and they have been able to deepen the port somewhere between 20 and 24 feet, average 22 feet in depth. Now, some of our smaller vessels can get in there, but those are the ones that cannot accommodate the seas and the ice conditions that are up there for the ones that can (the polar breakers and the larger vessels) the last refueling stop is Kodiak. So depending on where you are operating, you are talking about 900 or 1,100 miles from the gas station. Now, that is okay if you are a polar icebreaker because you have the sustainability and can carry the fuel and water to do that.

So those are the types of things we need to talk about. How would you create the capability to do that, and how would you be able to create forward presence? You do not have to have the ports if you have the ships that have the sustainability, and those are the tradeoffs.

Senator MURKOWSKI. So, you are right now in a seasonal assessment. You are up during these few short months of the summer. What, if anything, is being done to assess the assets that we have in winter conditions? If you need to move a helicopter out, for instance—

Admiral ALLEN. Yes, ma'am.

Senator MURKOWSKI [continuing]. Are we able to do what we need, given the assets that we currently have?

Admiral ALLEN. If you want to talk about helicopters for a second, I can give you probably a good example there. We have two types of helicopters, an H-65 Dolphin helicopter and an H-60 Jayhawk helicopter, a variant of the Blackhawk helicopter that the rest of the armed forces uses. Our H-65 helicopter is used largely on board ship, and they are shorter range. They do not have de-

icing capability. The H-60's do have de-icing capability. So one of the things we have learned on deploying up there, you can move an H-65 up there in the summer. It is not the optimum. Even in the summer we have icing conditions. I was flying in an H-60 between Nome and Shishmaref the other day, and we moved into icing conditions in the summer. So an H-65 might be at risk in operations up there. So the only helicopter that would have year round operational capability up there would be an H-60, but there are conditions when even an H-60 would not be able to fly, ma'am.

Senator MURKOWSKI. As far as our icebreakers go and our capacity, we have had the discussion about what the Congress is doing right now to put forward funding to bring into operational readiness one of our icebreakers. But in terms of our needed capacity, do we know—do you know at this point in time what we will need as an Arctic nation as we prepare for the additional commerce that we will see, whether it is energy-related or tourism-related or what have you? What do you really believe our capacity will be needed to be?

Admiral ALLEN. I think a good starting point is the assumptions related to our current fleet. When I came in the Coast Guard, I believe we had five icebreakers. We had them on both the east and the west coast. They did three major missions. We did the Pacific North of the Arctic, the Arctic West, if you will. We did the breakout of McMurdo Sound, a resupply, ultimately the South Pole Station, and we did Arctic East deployments, which were mainly the breakout of Tooele to support the Panzer Goose Operations of the Air Force at Tooele.

Based on an agreement with the Canadians, when we built the *Polar Sea* and the *Polar Star* and downsized our fleet, we went to three polar icebreakers under the assumptions that the Canadians under a current agreement would break out Tooele. And under that agreement, if they needed something in the Arctic West up around the boundary line off the North Slope, then we would provide them services. That led us to believe that we could have three icebreakers: one ice-strengthened, the research vessel, the *Healy*, and the *Polar Sea* and the *Polar Star*. That would allow us to break out McMurdo and take care of the Arctic West and the research requirements.

If there is an extensive requirement for us to reciprocate for what the Canadians are providing us in Tooele and we go below three icebreakers, all of a sudden—first of all, we become at risk of being able to meet our commitment. So even at our current readiness posture with the *Polar Sea* ready for sea and the *Polar Star* being laid up, if we were in McMurdo breaking out down there, had the *Healy* deployed, and there was a need to help the Canadians in response to what they do for us in Tooele, it starts to become problematic. If you move beyond that, you put additional requirements on, and then you start having to question whether or not the three icebreakers that are currently in the inventory are enough.

We have been approached by my other service chiefs with whom I work and by Chairman Mullen about the optimal laydown. If you wanted to have an icebreaker available to go north or south and have one available year round, to have what we call a 1-0 presence, it takes three ships to do that. And we have documented from

the Department of Defense, if it were achievable, six icebreakers will be needed to do that. I am not sure we ought to leap to that conclusion without validating the requirements, but I think absolutely the three is a four.

Senator MURKOWSKI. But that too is part of this needs assessment that you are undertaking to determine exactly what that is.

Admiral ALLEN. Yes, ma'am.

Senator MURKOWSKI. Let me ask about the *Healy* which is out, as you have mentioned, doing some of the extended continental shelf mapping which is so very important. Do you know how much more information we may need before we are able to—well, we cannot submit our claim, but in order to make an extended claim, do you know where we are in the mapping process?

Admiral ALLEN. Well, ma'am, you are a little bit above my pay grade academically on this one. I do know we have been working very, very hard to gather the seismic data. As you know, under the Law of the Sea Treaty, as the Governor has stated, we can assert a claim beyond the 200-mile limit up to 350 miles. That is based on seismic data that demonstrate that the outcropping is an extension of the continental shelf. The *Healy* has been involved for several years in doing that. Very, very important to this country. Regardless of where we ultimately go on the Law of the Sea Treaty, whether it is in accordance with the Law of the Sea or a unilateral claim, we have to be able to define that those are the limits of the shelf.

So I would have to bring somebody in to help you interpret, where we are going out there, but we are doing our best.

Senator MURKOWSKI. Well, I appreciate it.

Given what we know is happening in the Arctic and as you, I believe have said, all you know is that there is more water out there and you are in charge of it. How much does this change the mission of the Coast Guard all of a sudden—and I should not say all of a sudden, but by now having this expanded mission up north in terms of enforcement and just preparedness and readiness?

Admiral ALLEN. It does not necessarily change our mission. It places new requirements on how we execute our mission in a place that is dominated by what I would call tyranny of distance, harsh operating environments, lack of infrastructure, as we have talked about. I have the same requirements in the territorial sea off the Barrow Spit as I do off the tip of Key West, Florida. I have the same responsibility to conduct fisheries boardings and to make sure the laws are being carried out within the EEZ whether it is north of the Bering Straits or in the Gulf of Mexico or off Georges Bank in New England.

So it is a matter of projecting presence up there. It is a matter of U.S. sovereignty. It is a matter of being able to achieve the effects that are expected of us to accomplish our already-assigned missions in a place where the environment has been dramatically changed, and that really is the challenge.

Senator MURKOWSKI. And I will ask you one more question that is perhaps a little more politically charged. Most in the United States, I would dare say, do not believe or do not think of the United States as an Arctic nation. They do not appreciate much of

what we experience up north, and as we see diminished or diminishing sea ice up there, the landscape is changing.

As the Coast Guard is tasked with its overall mission around the country, is it a factor that you deal with that with the budget that the Coast Guard has and the mission that you are tasked with, that it could potentially be more difficult to get the resources and the assets that you need up north to provide for the level of protection simply because we are where we are? And again, most people do not view the Arctic as being something that we need to be responsible for right now.

Admiral ALLEN. Well, I think you have hit the center of the issue, ma'am. We would consider that discussion to be an extension of the outcome of that high-latitude study that is going on right now.

That is one of the dilemmas we have in the Coast Guard, and it is a good dilemma and a bad dilemma. The good news is we are a multi-mission agency. You put one ship out there. It can do five missions. The bad news is we are a multi-mission agency. You put one ship out there. It can do one mission at a time. So there is an inherent risk-management proposition associated with that. So we are never going to be completely optimized to cover all of our missions. We were never intended to be because that is the operational genius that pays so much back to this country.

The question is what is the threshold and how does that threshold change when requirements change in a place like the Arctic. In a purely political sense, it is up to me as the Commandant to frame that discussion as somebody who has a vested interest in Alaska.

I told somebody a while back when you compare us to another military service, what separates us is we do not deploy someplace to do our mission. We execute our mission where we live, and we become entwined in the DNA of our communities and the regions where we operate. I like to believe that because of that, we understand and know that. The question is—and you all raised it earlier—how do you transmit that to a larger audience where it is understandable? And you and I have had really great discussions in the past. It is probably because we are both Ketchikan brats, as we have talked about. But it is expanding that discussion to a larger circle and having it be understood. Frankly, I consider that a leadership role that I have to play as the Commandant of the Coast Guard and have been trying to play for the last 3 years.

That said, we are committed to moving to the North Slope with the resources we have. We have moved resources around. We have made sure that we can have a presence up there. And I think we have improved what we have done up there every year, and while we are making these decisions and having this discussion, that remains our commitment to Alaska.

Senator MURKOWSKI. Well, I appreciate that. I appreciate that commitment. I appreciate all that the Coast Guard does to serve us here in Alaska and around the country.

I look at the role that the Coast Guard is playing and will play up north and can only appreciate the incredible men and women that are serving us. I do not think we can say thank you enough. But I want to publicly recognize you and your leadership on how we are assuming the role as an Arctic nation and moving respon-

sibly to lay the groundwork for what we know is coming in terms of increased activity up there. So again, I appreciate all that you do and your great, great leadership for this State and for this Arctic nation. So thank you.

Admiral ALLEN. Well, I gratefully acknowledge that on behalf of my people, ma'am. Thank you.

Senator MURKOWSKI. You are with some of the best.

With that, let us call up the second panel, if we may, and thank you, Governor Parnell and Admiral Allen.

Okay, let us move on to our second panel. I have introduced each of the members previously. Again, I welcome you all. I will note that there is no particular order other than we decided to do it alphabetically. So we will begin the second panel testimony with you, Mr. Benton. I would again ask all of you if you can keep your testimony to within 5 to 7 minutes. Your full written testimony will be included as part of the record. David, why do you not go ahead and proceed?

STATEMENT OF DAVID BENTON, EXECUTIVE DIRECTOR, MARINE CONSERVATION ALLIANCE

Mr. BENTON. Thank you, Senator Murkowski, and thank you for holding this hearing. I want to extend our appreciation to you on behalf of the seafood industry for all the work that you have done for us over the years on a whole range of issues.

It may be a bit peculiar to have the fishing industry at a hearing on U.S. Arctic policy in some ways because currently there are no fisheries conducted in the U.S. EEZ. I think that it is a recognition that Alaska has taken a very interesting position, at least the seafood industry, the State, and the Fisheries Management Council, on how to address Arctic issues on fisheries. Anyway, I wanted to express my appreciation to you to provide us an opportunity to talk about that today and also to Senator Byrd for issuing the invitation.

Senator, as I mentioned, I approached the hearing with some questions in my mind about how to present the unique approach that the seafood industry took. Our organization, the Marine Conservation Alliance, represents harvesters, processors, and coastal communities involved in the major groundfish and shellfish fisheries in Alaska. Probably 70 percent production is represented by our membership. So it is not a small organization, and it is companies that have a vested interest in being able to go fishing.

Our association, however, worked with the North Pacific Fisheries Management Council to promote and initiate and eventually adopt—get the council to adopt the Arctic FMP which closes the entire U.S. Arctic to commercial fishing. The reason that the seafood industry took that position was a recognition on our part that the rate of change in the Arctic, the loss of sea ice is exceeding forecasts. It is quickly outstripping the level of science that we need to manage fisheries appropriately and on a sustainable basis, and frankly, the rate of change up there is putting a lot of other living marine resources that are ice-dependent under a lot of stress and is having very profound effects on the people that live around the Arctic coastline of Alaska, and we wanted to be part of the solution, not part of the problem.

The council, as you know, successfully adopted that Arctic FMP. It is in front of the Secretary of Commerce now. We have urged the Secretary of Commerce, along with many others, to adopt that FMP and to put that policy in place.

One of the reasons and maybe a driving reason for us, aside from those I have just mentioned, for getting the United States positioned in the way that it is is a recognition that with the loss of sea ice and the opening up of areas that have been inaccessible to date to potential commercial fisheries, both within our zone but also in the Russian zone, the Canadian zone, and most importantly, in the international waters of the Arctic Ocean—a recognition that the United States is going to have to take a leadership role in shaping policy up there to prevent impacts that we have seen in other parts of the world.

And I want to mention the Bering Sea. We had quite an experience in the late 1970s/early 1980s when the 200-mile limits were adopted by the nations around the world. Many distant water fleets were being pushed out of the 200-mile zones that were being claimed. In the Bering Sea, those were fleets from China, Japan, Poland, Korea, Taiwan, and they were getting pushed out of the zones of the United States and the zones of Russia. And a number of those fleets wound up in the international waters of the Bering Sea in the so-called donut hole.

There were no controls on those fleets. There was no resource surveys or scientific assessments of the status of the stocks out there that they were fishing on. There was minimal enforcement presence because the Coast Guard was primarily tasked, and appropriately so, trying to patrol our own boundaries. The Russian border guards were in the same position, and so there was virtually no enforcement of any regime in the international waters of the Bering Sea.

It took us many, many years to secure a convention for the central Bering Sea donut hole. And frankly, the only reason that we were able, in my opinion—and I was deeply involved in those negotiations. The only reason that we were, at the end, able to secure that convention is because the pollock stocks collapsed. The fishery grew very quickly from virtually zero harvest out there to well over 2 million metric tons, and then collapsed. And when it collapsed, the distant water fishing nations agreed to the convention that should have been in place from the beginning.

The reason I bring that up is I think that is an instructive lesson for what could unfold in the high Arctic.

So it was our position—and certainly you in the Congress and you personally demonstrated great leadership with Senate joint resolution 17 to get the United States policy oriented in the right direction and moving. And it was our position that the United States had to be on a good, solid footing to then go to the rest of the world and say, wait a minute, we do not want to repeat what happened in the Bering Sea donut hole in the high Arctic in the international waters where there are no fisheries now and there is also no regime in place. I think by getting Senate joint resolution 17 adopted and signed by the President, that got the State Department oriented to make this a priority and to engage the rest of the international community on a path to try and at least perhaps get

a moratorium on commercial fisheries beyond 200 miles. That was a very important step for us and I think it is going to serve the country very well.

Just a couple of things I want to touch on very quickly because I know that we are somewhat short on time. Listening to the Commandant, Admiral Allen, I think that we all—and certainly the seafood industry owes the United States Coast Guard a huge debt of gratitude.

In listening to his discussion about their assessments of their needs in the Arctic, one thing that I hope they keep in mind and certainly we would like for the Congress to keep in mind is the enormously critical and complex task the Coast Guard is already serving in the North Pacific and in Alaska. They have to patrol one of the longest maritime boundaries in the world and enforce the boundary. They have to enforce numerous treaties that are on the high seas that span the territory from Asia to North America. They have to enforce treaties in the Bering Sea, and now we are going to add to that requirement that they move into a whole new vast area and meet the challenges and they are significant challenges in the Arctic.

In meeting those challenges, the Congress, I hope, fully appreciates the complexity of the task that the Coast Guard has now and the need to not diminish their current capability in meeting that task. They are already in our view doing a wonderful job, but they are stretched thin on resources and they are going to be more stretched thin. And so this needs to be new money, new resources, not just sort of shuffling the existing resources around to patch holes as they move forward. So I wanted to call your attention to that.

And then the final thing, Senator, is the need for research and science. The Arctic FMP that the council adopted is going to be very dependent on what science gets done in the high Arctic. And that is true for a whole host of Arctic activities beyond fisheries. The research community has experienced a fairly significant increase in funds in recent years for Arctic research primarily I think in conjunction with NPRB-related research and also International Polar Year, and some of the funding increases have come about by those kinds of initiatives. But that is sort of a temporary thing.

PREPARED STATEMENT

As the United States policy unfolds, we would strongly urge you to look at a model similar perhaps to the North Pacific Research Board for the Arctic that provides a long-term, stable source of funding for Arctic research. It needs to be new money. Again, it is sort of like the situation with the Coast Guard. There is never enough money for marine research. There are a lot of needs in the North Pacific Ocean and the Bering Sea that are still not being met, but this new challenge is in front of us. We have got to meet it. So we need to see if we can find new sources of money, and those sources need to be longer-term, not sort of pulses of appropriations that come and go because of the burdens that that places on the research community.

With that, I will end my oral comments, and you have my written testimony for the record. Thank you very much.

[The statement follows:]

PREPARED STATEMENT OF DAVID BENTON

Thank you, Senator Murkowski, for chairing this hearing today to discuss the strategic importance of the Arctic to the United States, and emerging issues regarding Arctic fisheries management and conservation. I also want to thank the Subcommittee Chairman, Senator Byrd, for this opportunity to come before the subcommittee on these important issues.

For the record, my name is David Benton, and I am the executive director of the Marine Conservation Alliance (MCA). MCA is a broad based coalition of harvesters, processors, coastal communities, Community Development Quota (CDQ) organizations, and support services businesses involved in the groundfish and shellfish fisheries of Alaska. MCA was formed to promote the sustainable use of North Pacific marine resources by present and future generations. MCA supports research and public education regarding the fishery resources of the North Pacific, and seeks practical solutions to resource conservation issues. Our members collectively represent roughly 70 percent of the production of North Pacific fisheries.

MCA has been actively engaged for several years now in the development of U.S. policy regarding the Arctic, and Arctic fisheries. MCA recognized early on that climate change in the high Arctic was causing a rate of change in that region that argued for a unique precautionary approach to fishery management. There are many concerns regarding the loss of sea ice and the potential for new fisheries in the Arctic not only within our Exclusive Economic Zone (EEZ), but also in the EEZs of Russia and Canada as well as the international waters of the Arctic Ocean beyond the 200 mile limits of any of the Arctic nations. These include concerns regarding our state of knowledge about Arctic marine ecosystems, the status of potential fishery resources, the effects fisheries might have on other living marine resources such as marine mammals and seabirds, and the potential for impacts arising from fisheries beyond our EEZ on the resources and people of the U.S. Arctic to name a few. Because of these concerns, we worked closely with the members of Congress including this Committee to secure passage of Senate Joint Resolution 17. Similarly we worked very closely with the North Pacific Fishery Management Council on the recently adopted Fishery Management Plan (FMP) for the Arctic.

SJR 17 establishes a policy direction for the United States to engage the international community in negotiations to develop comprehensive international agreements for the management and conservation of fish stocks in the Arctic Ocean, and to take actions to prevent the development of commercial fisheries in the high seas of the Arctic until such comprehensive agreements are in place.

The North Pacific Fishery Management Council adopted a Fishery Management Plan (FMP) for U.S. Federal waters north of Bering Strait that adopts an ecosystem approach to management, sets forth scientific procedures to gauge future fisheries, and closes the U.S. Arctic EEZ to commercial fishing until the scientific information is available to make a determination whether or not to initiate commercial fisheries.

MCA believes that, taken together, these two initiatives form a solid foundation for U.S. policy. We have also been fortunate in the assistance to date from the Department of State and NOAA in pursuing these initiatives. Ambassador Balton at State has taken a lead role in pursuing implementation of SJR 17, and I want to publicly acknowledge his work. Additionally, NOAA Fisheries worked very hard with the North Pacific Fishery Management Council to help develop the Arctic FMP. Yet, considerable work remains to be done, particularly on the international front, to secure a sound, science driven management regime for Arctic fisheries. Madame Chair, today I would like to discuss these actions further, and steps that can be taken to protect United States interests in the Arctic.

Information that is now readily available should leave no doubt that the rate of loss of sea ice in the high Arctic has exceeded earlier forecasts. The potential is for large areas of the Arctic Ocean to become ice free for large portions of the year. In conjunction with this trend, there is evidence that marine resources are redistributing themselves accordingly. For example, the distribution and migrations of ice dependent marine mammals and seabirds is changing rapidly and many of these species are experiencing environmental stress. Similarly, there is evidence of fishery resources such as salmon, crab, and groundfish moving west and north from the North Pacific into the Arctic, although comprehensive data are lacking. What data we have indicate that the distribution of salmon is expanding in the Chukchi and Beaufort Seas, and there is evidence that certain crab species and some groundfish may be moving northward into the Chukchi as well.

Beyond our own waters, the status of fishery resources is less clear. There is some information regarding fish stocks in the Russian and Canadian EEZs, but like the

United States, comprehensive data are lacking. In the case of the international waters beyond our respective EEZs data are even more sparse. With the retreat of sea ice and changing ocean conditions there is also the potential for species from the Atlantic side to move into the high Arctic waters on the Pacific side, yet there is little or no data available to assess this possibility.

This lack of scientific information should mean that the nations of the world will restrain themselves until the necessary data are available. Unfortunately, the record is often just the opposite. The situation is similar to what occurred in the international waters of the Bering Sea in the early 1980's, a series of events we should avoid repeating if at all possible.

During the late 1970's and early 1980's, foreign fleets were pushed out of the 200 mile zones of coastal states around the world. In the Bering Sea, where large fisheries were being conducted by a number of distant water fleets, this led to the rapid expansion of a multi-national fleet entering the international waters beyond the Russian and U.S. zones. This area, referred to as the Donut Hole, had not been scientifically surveyed to assess stock status, there were no controls on the fishery, and enforcement consisted almost solely of the United States and Russians trying to patrol their respective maritime boundaries to prevent incursions into their domestic waters. These fleets came from Japan, China, Poland, and the Republic of Korea and by the late 1980's numbered several hundred vessels. They were concentrating on Pollock and harvests peaked at a reported 2 million plus tons before the stock collapsed.

In the late 1980's the United States and Russia initiated negotiations with the distant water fishing nations with the intent of securing an international management regime to conserve the stocks and regulate the fishery. These negotiations lasted several years and only came to a conclusion when the pollock stock collapsed. The treaty that should have been in place from the beginning, before the fishery started, is now in place but the pollock resource remains at extremely low levels. There is no fishery in the Donut Hole now with the exception of tightly controlled experimental fishing to assess stock status.

This experience should be a warning about how events may unfold in the high Arctic. Several non-Arctic nations are already establishing a presence in the region through research cruises and other means. There are fisheries in the Atlantic taking place north of the Arctic Circle. There are international fishery management agreements already in place for fisheries in the north Atlantic and Barents Sea with authorities extending into Arctic waters on the Atlantic side. There is talk of extending their jurisdiction. The European Union, among others, has indicated an interest in asserting influence in the high Arctic. The point being, numerous interests and nations that have been prevented from moving into the Arctic Ocean off our shores by the presence of sea ice are looking north.

MCA believes that the United States needs to aggressively pursue a multi-pronged strategy to prevent what occurred with the Bering Sea Donut Hole from unfolding in the Arctic. This strategy needs to be built on developing bi-lateral understandings with our Russian and Canadian neighbors. It is in their interests just as much as it is ours to pursue a course of action to close the international waters of the Arctic Ocean to commercial fisheries now, and not repeat the experience we had with the Bering Sea Donut Hole. If we can secure agreement with Russia and Canada that there be no commercial fishing in the high seas of the Arctic Ocean, then the three largest Arctic nations can present a united front to the rest of the world with some likelihood of success in securing such an agreement.

From our perspective this is the best way to realize the intent and purpose behind SJR 17.

A closely related matter is the conservation and management of resources within the EEZs of the United States, Russia, and Canada. It is in the United States interest to engage our two neighbors in bi-lateral discussions to ensure consistent management and conservation actions for transboundary stocks we might share between our respective EEZs. This is particularly true for Russia. The Chukchi shelf extends from Alaska across the maritime boundary to the Russian coast. Many of the marine mammals, seabirds, and fishery resources of the Chukchi move through Bering Strait which we share with the Russians. If fisheries develop on the Pacific side of the Arctic north of Bering Strait, they are most likely to start in the Chukchi and it may be the Russians who commence fisheries first. Because of the interconnectedness of resources within United States and Russian waters it is important that the two nations cooperate in developing complimentary scientific assessment and resource management programs now before fisheries commence.

The same can also be said regarding the need to initiate bi-lateral talks with Canada. However, there is probably less urgency, as the likelihood of significant fish-

eries beginning in the Beaufort Sea in the near term is less than it is with the Russians in the Chukchi.

It is our understanding that there has been some exploration of these matters with both nations, and MCA applauds those efforts. However, MCA also believes that serious bilateral negotiations need to commence in the near future to make progress. MCA recognizes that these bi-lateral talks will be time consuming and difficult. In both instances they will be complicated by other issues, including boundary disputes. However, failure to reach an understanding with our Arctic neighbors regarding fisheries will put at jeopardy the conservation efforts the United States initiated with the Arctic FMP. With this in mind, MCA urges the United States to segregate fishery talks from other, more controversial negotiations.

A key component of a comprehensive strategy for U.S. Arctic fisheries involves actions within our own waters. MCA supports the adoption of the Arctic FMP and related regulations. Attached, for the record, is our recent letter to Secretary Locke requesting his approval of the Arctic FMP. Successful implementation of the Arctic FMP is contingent upon good scientific information on Arctic marine resources, including fish stocks, and the Arctic ecosystem. U.S. Arctic research in recent years has received significantly more attention, due largely to the International Polar Year with its emphasis on the Arctic. This will be a short lived boost, unless a stable, long term source of funds and resources is put in play for Arctic research.

This Committee has, in the past, taken a lead role in developing stable sources of funding for marine research. In Alaska, the North Pacific Research Board is providing a long term vision and stable funding for marine research. The NPRB is in the process of conducting, in conjunction with the National Science Foundation, a multi-year multi-discipline ecosystem assessment of the Bering Sea. This \$50 million program will provide important insights into the Bering Sea ecosystem, and factors affecting it like climate change and loss of sea ice. A similar model could be looked at for Arctic research.

The final component for a comprehensive strategy for the U.S. Arctic goes beyond fisheries considerations. The United States Coast Guard (USCG) has a critical and enormously complicated mission in Alaska. With search and rescue operations in two oceans and three seas, enforcing several international agreements spanning the North Pacific and the Bering Sea, patrolling one of the worlds longest contiguous maritime boundaries, and not to mention maintaining a robust enforcement presence in the Nation's largest domestic fisheries the USCG already has a lot on its plate. Now, with the opening of the Arctic and the need for an increasing presence in this vast region, MCA is concerned that sufficient new funding and resources be made available to the USCG to accomplish its new Arctic mission without diminishing its existing mission and presence in other parts of the North Pacific and Alaska. We strongly urge the Congress, and this Committee to fully fund the USCG mission in Alaska, and not allow this new challenge in the Arctic to undermine the excellence of the USCG in meeting the demands of its existing mission.

Madame Chair, I want to thank you and members of the Committee for providing this opportunity to testify before you today. I will be happy to answer any questions you may have.

Encl: (1) MCA Letter to Secretary of Commerce, July 24, 2009.

MARINE CONSERVATION ALLIANCE,
Juneau, AK, July 24, 2009.

Ms. SUE SALVESON,
Assistant Regional Administrator, Sustainable Fisheries Division Alaska Region, National Marine Fisheries Service, Juneau, AK.

Re: 0648-AX71 (PR) Arctic FMP
Attn: Ellen Sebastian.

DEAR MS. SALVESON: The Marine Conservation Alliance (MCA) wishes to express its support for Secretarial approval of the Fishery Management Plan for Fish Resources of the Arctic Management Area (Arctic FMP) and Amendment 29 to the Fishery Management Plan for Bering Sea/Aleutian Islands King and Tanner Crab (Crab FMP). The MCA is a coalition of harvesters, processors, Community Development Quota organizations, and coastal communities involved with Alaska groundfish and crab fisheries.

Our support for adoption of the Arctic FMP includes the establishment of the Arctic Management Area, the approach used in the FMP to establish target and ecosystem component species groups, and the general prohibition on commercial fishing in the Arctic Management Area until stock assessments are completed. Based on stock assessments and other scientific analyses, and following the Council's thorough public review and decision making process, we expect future management actions to be taken, including establishment of commercial fisheries, in accordance

with the national standards and other provisions of the Magnuson Stevens Act (MSA) and other applicable law. We urge the Secretary, and the National Marine Fisheries Service (NMFS) to approve the Arctic FMP and Amendment 29 in their entirety.

MCA has supported the development and adoption of the Arctic FMP from the very beginning. We recognized early on that climate change in the high Arctic was causing a rate of change in that region that argued for a unique precautionary approach to fishery management. There are many concerns regarding the loss of sea ice in the Arctic, and existing scientific research hasn't answered these concerns. Preventing the incursion of commercial fisheries until the science is available to make sound decisions is the only logical approach to management in this region.

Future decisions regarding whether or not to initiate fisheries in the Arctic Management Area will be guided by this FMP and the Magnuson Stevens Act. Authorizing a fishery will require an amendment to the FMP, with the full suite of analyses and public participation the Council process entails. Through this process, issues such as Essential Fish Habitat (EFH), defining optimum yield and how to achieve it, setting harvest specifications and determining overfishing limits, vessel licensing or effort control rules, fishery monitoring and observer coverage, controls, and impacts on ecosystem components will all have to be addressed. In addition, concerns regarding marine mammals, seabirds and other waterfowl will also have to be addressed and impacts avoided. The Council's deliberative process is well suited to ensure that this is a robust process that will in the end result in sustainable fisheries if they are authorized.

To ensure that the Council process keeps pace with the rate of change in the Arctic, it is important that the Council and NMFS make scientific research in the Arctic a priority. MCA recommends that the NMFS and Council develop a suite of research priorities, including stock assessments, for the Arctic for implementation by NOAA. These research priorities should also be forwarded to the North Pacific Research Board (NPRB) for their consideration as well.

In addition, we encourage NMFS and the Council to continue work through the committee process to develop further guidance and criteria for initiating analysis of potential new fisheries, including conditions that would need to be addressed if and when fisheries are authorized in the Arctic Management Area.

Adoption of the Arctic FMP and Amendment 29 sets the stage for thoughtful and science driven deliberations regarding future fishery development in the Arctic region. These deliberations not only need to be guided by good science, but also by active engagement with the people who live along Alaska's Arctic coast. MCA fully supports efforts to include Alaska's Arctic residents in decisions that affect them. During development of the Arctic FMP, the Council made exceptional efforts to engage the residents, communities, and organizations representing the people of Alaska's Arctic. The Council has recently established a strong outreach program to continue this effort, as well as a new committee to more fully engage Alaska's subsistence communities in the fishery management process. We are confident that the Council will continue this effort to include meaningful participation by the people of the communities along the Arctic coast in future management decisions.

As a final point, we also wish to encourage the Secretary to fully engage in international discussions regarding fishery management in the high Arctic. MCA believes that bi-lateral discussions with our Russian and Canadian neighbors are extremely important to ensuring coordination throughout the Arctic region. This coordination is necessary to ensure that the conservation actions taken by the United States through the Arctic FMP are complemented, and not undermined, by any management actions taken by our Arctic neighbors in their waters, or by other nations in the international waters of the Arctic Ocean. It would be unfortunate to have a repeat of our experience in Bering Sea "donut hole" in the Arctic.

Thank you for this opportunity to comment.

Sincerely,

DAVE BENTON,
Executive Director.

Senator MURKOWSKI. Thank you, Mr. Benton.

Just so that you know, what we will do is we will have testimony from each of you and then I will come back and ask my questions of you at that time. So thank you.

Dr. Brigham, welcome.

STATEMENT OF DR. LAWSON W. BRIGHAM, PROFESSOR OF GEOGRAPHY AND ARCTIC POLICY, UNIVERSITY OF ALASKA FAIRBANKS

Dr. BRIGHAM. Thank you, Senator. I am here again to flaunt the Arctic Marine Shipping Assessment which at least here is legislation implemented—

Senator MURKOWSKI. Why do you not go ahead and pull that mic just a little bit closer?

Dr. BRIGHAM. Sure. In fact, just so you know there is international interest, I go on Saturday to brief the Norwegian Ship Owners Association, the Norwegian Foreign Ministry, Norwegian Institute of Defense Studies, and DNB, which is the classification society, all in Norway about AMSA. So it is not only domestic but international interest in this important comprehensive study led by the United States, Finland, and Canada.

I should remark that there are three complementary ways in which you can view this study. It is certainly baseline assessment for Arctic marine activity early in the 21st century, and we are quite confident that in the future all future studies would look to this study as really the baseline study and an important starting point.

Second, I think everyone should know that this is an Arctic Council policy document. There have not been too many policy documents issued by the Arctic Council. It is an intergovernmental forum, but in this case, all eight countries have agreed and every word in this document painfully, as it took place, was negotiated by the eight Arctic countries. So in fact the 17 recommendations and all the words in this document can be really interpreted as a message of the Arctic states to the world on how they intend, including us, in very broad principles to protect Arctic people and the Arctic marine environment.

And finally, this document is a strategic guide to all the ministries, all the departments of the eight Arctic states. It is also a strategic guide to the global maritime industry on what the Arctic states are thinking. It is a guide to the indigenous people, a host of stakeholders, all of which are in the Arctic today and coming to the Arctic through the century. The AMSA highlights a way forward and it also points to the significant research and infrastructure that is needed to be funded in the future for enhancing marine safety and environmental protection.

There were 90 specific findings, and I will just summarize seven of them in very broad terms, some of which already folks have spoken about.

The presence of Arctic shipping. Already we have the global maritime industry in the Arctic, and perhaps the regulatory environment, the regulatory system is not up to the arrival of the global maritime industry. Of course, that involves IMO, the International Maritime Organization, moving forward more quickly than it has in the past to enhance marine safety and environmental protection.

Certainly a growing presence of large cruise ships in the Arctic. Perhaps today the most pressing issue for the Arctic states is the presence of cruise ships with 3,000 passengers in the high latitudes, particularly around Greenland in this case.

Most of the traffic today supports natural resource development, but there is a specter of trans-Arctic navigation in the future, at least during a short summer season.

We talked about today already sea ice changes, but the important point was already made that while there is a season of diminished ice, perhaps ice-free, whatever that means, most of the year through the century it is ice-covered, and the implications of that is that all ships in the future navigating the Arctic have to have some polar-class capability. So they have to have enhanced standards for operating in this environment.

We did find in this study a general lack of uniform mandatory rules and an important point, nondiscriminatory rules, because we want international standards. So we saw a potpourri of different rules and standards in the Arctic and it is up to the IMO and the leadership of the Coast Guard at IMO representing the United States to move toward international standards which are mandatory.

We found in the study that most of the marine activity in the future will be conducted by non-Arctic stakeholders, people with little knowledge of the Arctic, some knowledge, but perhaps the majority with little knowledge of the Arctic. There will be multiple users in many Arctic waterways like the Bering Strait, and obviously, there is a potential overlap of new marine operations in areas of traditional indigenous use. That is quite clear.

Many uncertainties in the future of Arctic navigation: gas prices, oil prices, fee systems, sea ice variability, new discoveries, world trade patterns, et cetera. So it is very hard to define exactly what the future might be in numbers of ships, but clearly the future of marine operations is linked to the global economy and depends upon both global and regional factors.

We talked about UNCLOS already, and the study reaffirmed that UNCLOS is the framework for governance of marine operations and overall use in the Arctic Ocean. It is an ocean we have to emphasize again to everyone from the Arctic states to the world. It is an ocean, folks. UNCLOS is the framework, the legal framework, for regulation, in particular, of shipping. IMO is the operative agency, the competent U.N. agency, to develop shipping rules and regulations, and then our part and your part is to embed those regulations in domestic law and those international standards.

One of the final findings and the most important one that we have talked about today is marine infrastructure. There really is no superior present marine infrastructure in most of the Arctic. Some modern infrastructure along the Norwegian coast, some in northwest Russia, but for most of the Arctic, it is very different than the rest of the planet, the rest of the world's oceans. There is no infrastructure. Few charts. 8 to 10 percent of the Arctic Ocean is charted to international standards. That leaves 90-plus percent to be surveyed. A little SAR, salvage, ship monitoring and tracking, AIS navigation, and on and on and on. You mentioned many of these, all termed infrastructure, all lacking in the Arctic. The most significant one today, though, is the hydrographic database for charting is certainly not adequate in most areas to support current and future Arctic marine activities to support them safely.

There are 17 recommendations in the document. They are divided into three broad themes: enhancing Arctic marine safety, which is IMO level international work; protecting Arctic people and the environment; and building the infrastructure. I will not go through all 17. I will leave that to folks to read in the study. But I wanted to turn to several specific things that could be done in the United States Arctic with the outcomes of this study.

All of the recommendations in AMSA apply to the U.S. maritime Arctic and all are of strategic importance. The outcomes of AMSA relate to broadly U.S. energy, economic security, as we know, environmental security, maritime security. The entire U.S. maritime Arctic was addressed in many ways in the AMSA study, and in a specific area, the Bering Strait region from about Point Hope south to the ice edge was studied in some detail because it is a region of significance for future traffic in and about the entire basin. And without further investment and development of a broad array of marine infrastructure in the United States Arctic, it would be very difficult to adequately address even a limited number of risk scenarios for emergency response in the region.

And I will just read my specific immediate requirements that come from the AMSA.

The first is really we do need a comprehensive risk assessment of future marine activity in the Bering Strait region. We have one ongoing, of course, in the Aleutian Chain, but really what we need is one from the National Academy and the Coast Guard and other agencies to perform that risk assessment to find out what are the challenges ahead.

We need to strengthen and build an Alaska ocean observing system so that system can be responsive to all of the users today and in the future.

Certainly we need to expand hydrographic surveying and charting, and the legislation you proposed will help that, but it has to be sustained into the future.

We need to develop an enhanced capacity for what is called Arctic marine traffic awareness, a fancy term for really monitoring and tracking ships. And part of that is to work with our Russian colleagues in passing and sharing data in real time so we have a picture in real time of ship traffic in and amongst the Russian Arctic and the United States Arctic here in the Bering Strait region.

We need enhanced cooperation with the Russian Federation in environmental response and SAR, and we have some of that with the Coast Guard leadership here in Alaska.

An important one is the future mandatory standards I have mentioned. You have to embed that in domestic legislation in the future.

We certainly need a mix of icebreaking capability not only for the deep ocean but for the coastal ocean. So the Coast Guard needs capability to operate in coastal seas, and the buoy tenders and the ships of the future need to operate in ice-covered waters and in shallow waters around the coast.

An important one that we were not able to orchestrate in AMSA was we need in the United States and the other Arctic states need a comprehensive Federal and State survey of Arctic marine use by, in this case, Alaska's indigenous communities. Each of the Arctic

countries were asked and the permanent participants in the Arctic Council and indigenous people were asked to conduct a survey, provide information to us in the AMSA effort, and we did not get any response from any of the Arctic states or the indigenous groups, which was interesting. We need that survey so we can match up survey with new uses so we can figure out a regulatory and safe management of the region.

PREPARED STATEMENT

And finally, we need enhanced support for oil spills on ice. I am sure you will hear about that in the future.

The challenges are many for Alaska's extensive maritime Arctic. We certainly need a strategic vision of sustained support.

I thank you for this opportunity to testify before you.

[The statement follows:]

PREPARED STATEMENT OF DR. LAWSON W. BRIGHAM

Good afternoon Madam Chair. Thank you for continuing to focus on issues related to the U.S. Arctic and America's many, key roles in the circumpolar world. From 2005–2009, I was Chair and U.S.-Lead for the Arctic Council's Arctic Marine Shipping Assessment (AMSA). My remarks will focus on AMSA and how AMSA's many outcomes relate to Alaska and U.S. Arctic interests.

Introduction

The AMSA 2009 Report was approved by the 8 Arctic Ministers at the Arctic Council Ministerial Meeting in Tromsø, Norway on April 29, 2009. This comprehensive study of current and future Arctic marine activity, led by Canada, Finland and the United States, can be viewed in three important and complementary ways:

- As a baseline assessment of Arctic marine activity early in the 21st Century. We are confident all future studies on the topic of Arctic marine shipping will use this 2009 assessment as an important starting point for their future work.
- Second, as an Arctic Council policy document—the 2009 Report is a negotiated document where the 17 AMSA recommendations have been accepted by the 8 Arctic national governments. Thus, AMSA is a 'message' to the world from the Arctic States on how they intend, in broad principles, to protect Arctic people and the Arctic marine environment. During the April 2009 Ministerial Meeting, the U.S. Delegation had a highly influential role in AMSA gaining approval of the entire final report.
- And third, as a strategic guide for the Arctic State governments, the global maritime industry, indigenous people, and for a host of stakeholders who intend to use the Arctic Ocean throughout the century. AMSA highlights a way forward, but also indicates that significant research and infrastructure need to be funded to provide for enhanced marine safety and marine environmental protection throughout the Arctic Ocean.

Central Issues of AMSA

The AMSA 2009 Report identified more than 90 specific findings. I believe seven central issues express the overall sense of the assessment:

Presence of Arctic Shipping.—The global marine industry has already arrived in the Arctic to support natural resource development and regional trade. Also, there is a growing presence of large cruise ships in Arctic waters, especially in Greenlandic waters. The vast majority of these voyages are destination (meaning the ship sails north, performs some marine activity, and sails south). There are few trans-Arctic voyages today, but more ships may attempt trans-Arctic voyages during future summers of reduced Arctic sea ice or ice-free conditions.

Arctic Sea Ice Changes.—Arctic sea ice continues to retreat—visible examples are record sea ice retreats north of Barrow during summer and autumn—providing increased marine access and potentially longer seasons of navigation along all Arctic routes. However, the winter sea ice cover will remain and regions of the Arctic will be partially ice-covered in spring, summer and autumn. The regulatory implication of this variable ice coverage is clear: future ships navigating in these Arctic waters will require some level of polar or ice class capability.

Arctic Shipping Rules and Standards.—There is a general lack of uniform, mandatory and non-discriminatory Arctic ship regulations and mariner, ice navigation

standards for the Arctic Ocean. There are no specifically tailored, mandatory environmental standards developed by the International Maritime Organization (IMO) for vessels operating in the Arctic.

Future User Challenges.—Arctic marine activity will include mostly non-Arctic stakeholders, multiple users in Arctic waterways, and the potential overlap of new marine operations with traditional indigenous uses.

Uncertainties of Future Arctic Navigation.—The AMSA scenarios effort identified a large number of uncertainties that may define the future of Arctic shipping: legal and governance regimes; oil and gas prices; hard minerals/global commodities pricing (for example nickel, copper, zinc, and high grade iron ore); climate change and sea ice variability; new resource discoveries; transit fees; world trade patterns; the roles of the marine insurance industry; advanced Arctic ship technologies, and more. The future of Arctic marine operations is linked to the global economy and depends on global and regional factors.

The United Nations Convention on the Law of the Sea (UNCLOS).—UNCLOS provides a fundamental framework for the governance of Arctic marine navigation and overall marine use. Since most of the Arctic region is an ocean, UNCLOS sets out the legal framework for the regulation of shipping according to maritime zones of jurisdiction. Also AMSA notes that the IMO is the competent U.N. agency for issues related to international shipping including maritime safety, security and environmental protection. The IMO acts as a secretariat for most international maritime conventions and facilitates their implementation through the adoption of numerous codes and guidelines that become international rules and standards.

Arctic Marine Infrastructure.—There is a general lack of marine infrastructure in the Arctic except for areas along the Norwegian coast and coastal regions of north-west Russia. Missing or lacking infrastructure include: hydrographic data; charts; communications; ports and port facilities; adequate environmental monitoring (for weather, sea ice and icebergs); search and rescue (SAR) capability; environmental response capability; salvage; ship monitoring and tracking (Arctic maritime traffic awareness); aids to navigation; and, more. AMSA states clearly that the vastness and harshness of the environment make conduct of emergency response significantly more difficult in the Arctic. Significantly, the Arctic's hydrographic database for charting is not adequate in most areas to support current and future Arctic marine activities. And, the observation network of meteorological and oceanographic observations important to safe navigation is extremely sparse and not adequate for increased Arctic marine transportation.

AMSA Recommendations

AMSA's 17 recommendations are presented in the report under three broad, inter-related themes: (1) Enhancing Arctic Marine Safety; (2) Protecting Arctic People and the Environment; and (3) Building the Arctic Marine Infrastructure. These themes are fundamental to understanding the complexity of responding to increased marine use and to the breadth of current and future investment required to achieve enhanced marine safety and environmental protection throughout the Arctic Ocean. Implementing the AMSA recommendations will require extensive international cooperation and public-private partnerships. The following are selected comments on the AMSA recommendations.

Under the first theme, Enhancing Arctic Marine Safety, the Arctic states have decided to support (together) efforts at IMO to strengthen, harmonize and regularly update international standards for Arctic vessels. They have decided to support efforts to augment global IMO ship safety and pollution prevention conventions with specific mandatory requirements for ship construction, design, equipment, crewing, training and operations in the Arctic. It would be a goal that all ships operating in the U.S. Arctic waters meet these future requirements and standards. Also, the Arctic states have decided to support development and implementation of a comprehensive, multi-national Arctic search and rescue SAR instrument (including aeronautical and maritime SAR). The Arctic Council has already formed an SAR Task Force led by the United States to initiate drafting of such an instrument. The Arctic states have also agreed to explore the possibility of uniform Arctic safety and environmental protection regulatory regimes, particularly for the central Arctic Ocean.

For the second theme, Protecting Arctic People and the Environment, the Arctic states have recognized the importance of engaging with Arctic communities with effective communication when Arctic shipping and other economic activities are envisioned. They also understand and support exploring the need for internationally designated areas for the purpose of environmental protection in Arctic marine regions; the IMO's "special areas" or Particularly Sensitive Area (PSSA) designation are possible tools to study. The Arctic states have also decided to enhance the mu-

tual cooperation in the field of oil spill prevention. It is important to note that AMSA identified the release of oil into the Arctic marine environment (either accidental release or illegal discharge) as the most significant threat from Arctic shipping. In addition the Arctic states have decided to engage with relevant international organizations (such as IMO and the International Whaling Commission) to further assess the effects on marine mammals due to ship noise, disturbance and strikes in Arctic waters.

For the last theme, Building the Arctic Marine Infrastructure, the Arctic states recognize the critical importance of greatly improving marine infrastructure in the region so as to enhance marine safety and marine environmental protection. They have given their support to continued development of a comprehensive Arctic marine traffic awareness system (for ship monitoring and tracking) and to improve ship data sharing in near real-time. These efforts will require close international cooperation and the involvement of the maritime industry. The Arctic states have decided to continue to develop a circumpolar pollution response capability through circumpolar and regional agreements. They also understand the need to improve access to data and information in support of safe navigation and voyage planning in Arctic waters. These efforts would entail enhanced hydrographic surveys and improved systems for meteorological and oceanographic information.

AMSA and U.S. Arctic Requirements

All of AMSA's recommendations apply to the U.S. maritime Arctic and are of strategic importance. The outcomes of AMSA relate broadly to U.S. energy and economic security, environmental security, and surely, maritime/naval security. The entire U.S. maritime Arctic was addressed in AMSA and a specific area, the Bering Strait Region, was studied as a region of significance to the future of marine transportation in the entire Arctic basin. Without further investment and development of a broad array of marine infrastructure in the U.S. Arctic, it will be difficult to adequately address even a limited number of risk scenarios for emergency response in the region.

A review of the findings, recommendations and analyses of AMSA suggests the following select and immediate requirements for the U.S. maritime Arctic:

- A comprehensive risk assessment of future Arctic marine activity in the Bering Strait region.
- Strengthening and building an Alaska ocean observing system that can be responsive to the needs of an expanded number of marine users throughout U.S. Arctic waters.
- Significantly expanded hydrographic surveying and charting in the Bering Strait region and in all U.S. Arctic waters as marine use moves northward.
- Development of an enhanced capacity for Arctic marine traffic awareness—a system to monitor and track ships, particularly in the Bering Strait region and across the North Slope—and continued cooperation with the Russian Federation regarding ship data sharing in near real-time.
- Enhanced cooperation with the Russian Federation on Arctic environmental response and SAR in the Bering Strait region.
- Application of future mandatory standards and guidelines for Arctic ships developed at IMO to U.S. Arctic waters through timely implementation of maritime regulatory legislation.
- Building a mix of icebreaking capability to meet U.S. national interests in Alaska's Arctic coastal waters and strategic needs throughout the Arctic Ocean.
- Conducting a comprehensive federal and State of Alaska survey of Arctic marine use by Alaska's indigenous communities to assess the impacts of future marine operations in U.S. arctic waters.
- Enhanced support for oil spills in ice research and continued investment in scientific development of ecosystems-based management and the large marine ecosystem (LME) concept as tools for application in the U.S. maritime Arctic.

The challenges of expanded marine use along Alaska's extensive maritime Arctic are many. The future will require a strategic vision of sustained support and a full realization that the U.S. maritime Arctic is important to our national security and economic interests.

Thank you for the opportunity to testify before you today on AMSA and the Arctic. I am pleased to answer your questions.

Senator MURKOWSKI. Thank you, Dr. Brigham.
Mayor Itta, welcome.

**STATEMENT OF EDWARD S. ITTA, MAYOR, NORTH SLOPE BOROUGH,
ALASKA**

Mr. ITTA. Thank you. I am honored to be here today, Senator, and especially grateful to you for the opportunity to sit on this panel, one of the first I believe that has happened relative to my home country. And it is interesting that the homeland security portion is tied into this.

I want to lead off by saying that while I am the North Slope Borough mayor, my thoughts and feelings come from a lifetime spent in the Arctic as an Inupiaq Eskimo, as a whaling captain, and as a hunter under the guidance of elders and expert hunters like my father and his father before him as far back as we can remember, as well as my own experience as I just stated.

I note that there are five general areas that are of importance, and I will just note them: fishing; tourism, i.e., cruise ships; marine transportation; and energy. I want to add a fifth, and that is where I am coming from and that is relative to the issue of subsistence and sustenance through subsistence and value of being Inupiaq as a culture. I want to focus today my discussions on the first and the fifth or the fourth and the fifth items I stated. Largely my testimony will be related to energy as it relates to subsistence and our culture.

As our people have observed the increasingly rapid retreat of the multi-year ice pack and other symptoms of global climate change, one thing has become clear. Our land, the Arctic, is under a lot of stress, and it could be stressed further by commercial opportunities that arise as the polar ice cap continues to shrink. As residents of the Arctic, we are worried. As citizens of the United States, we are determined to see that human activity under these fragile conditions does not make things worse.

In the next few minutes, I would like to share my ideas for making sure that a more accessible Arctic is not thrown into further imbalance by future commercial or industrial activity.

The first thing I believe we need to do—and I am glad to hear that this is a general area of consensus of a lot of my colleagues—is to beef up the scientific research effort in the Arctic to make sure that we have adequate baseline data. We have to know the wildlife populations and the habitat before any of these activities in the outer continental shelf get underway. And I say this because if we do not, we will not be able to measure impacts or understand the impacts of the activities going forward. We need a line of reference, and we do not have that.

A combined Federal, State, and local framework for collaborative research is already in place, and this is one that you are familiar with and that we thank you for supporting, and that is the North Slope Science Initiative. It needs adequate funding. It has got a great mission. It wants to combine the efforts of various agencies and entities so that there is some coordination in all the activities.

Responsible resource development in an increasingly fragile polar world will also require strong regulatory protections. And I want to applaud you, Senator Murkowski, for recognizing this in your proposed language that requires any proposed offshore oil and gas production, to use pipelines to shore-based facilities rather than tanker transportation across Arctic waters to distant infrastructure

because we know most of the damage of oil spills has been caused in the transportation process. This is a fundamental safety precaution that must be in place in the event of OCS production.

At the same time, the Federal Government has to apply existing regulations more vigorously in the offshore leasing process. That is the only way to prevent what has unfortunately happened in the last few years, when environmental reviews and other regulatory standards that are in place now have been so poorly applied that it forces us into court. And this is certainly not where I want to engage our oversight agencies. I do not believe that that is the answer, but I firmly believe that this is indicative of a problem that needs to be looked into out here.

During the past 30 years, we in the North Slope have worked with industry hand in hand in support of onshore Arctic oil and gas development. During that three decades, one of the things that we have noticed is that individual projects can have a specific set of impacts, but in combination with other nearby projects, they can also have additional cumulative impacts. We think it is important for these to be separately monitored and analyzed in the course of development because while one project will not hurt a specific group of animals that migrate, a number of them will when you put them all together. There is no system in place right now to look at cumulative impacts as a whole, and we believe that that is an important area.

When I talk about baseline science and cumulative impacts, I get often a lot of resistance, impressions of code words. Some people think that these kind of protective standards are beyond what is necessary, but this is how I look at it. We have heard widely publicized and widely promoted predictions relative to oil and gas in the Arctic OCS, numbers of \$70 billion that might be there in resource wealth. \$70 billion. Such vast upside potential carries with it, I believe, a responsibility to use world-class standards and safeguards that minimize any potential costs in damage to the Arctic environment and the subsistence way of life. World-class safeguards should include zero volume discharge requirements like they have in Norway. Spill prevention and response measures should be viewed really as a good investment to industry that pays dividends in avoiding the cost of a spill response.

I would also like to see a provision in Federal law that requires independent State licensed marine pilots on certain types of vessels crossing the Arctic Ocean both in the Chukchi and the Beaufort Sea. It is a preventive measure that makes as much sense in the Arctic as it does in Cook Inlet or in the Prince William Sound.

I believe these kind of safeguards make even more sense in the Arctic than they do in development areas further south because we know as a people living there the Arctic is uniquely unforgiving, hardly any room for error and mistakes. We know this living life and death issues that we are aware of. Broken ice conditions, scenarios that have never been encountered before—broken ice conditions at various times of the year make any kind of a spill response virtually impossible, which means spill prevention is doubly, maybe triply, important.

Also, the Arctic has very little emergency response capability, as my colleague here—and I might note that you have been active in

the Inuit Circumpolar Council as the unit in Alaska that works with as a permanent participant through the Inuit Circumpolar Council—that the 17 points he mentions are vitally important. We have very little emergency response capability. And you mentioned we do not have safe harbors for vessels and whatnot in the event of a catastrophe or an accident in an area that is so vast and so remote, people have no comprehension of what it is that we are talking about.

As we see this exploding interest in OCS resource development, marine shipping, and other uses, it is pretty clear to us that the Arctic needs a Coast Guard presence, and we wholeheartedly support the efforts, the good efforts, of Admiral Allen and his group. We need a year round Coast Guard presence in the North Slope and better navigational infrastructure. There are so many basic infrastructure items that are lacking now.

And I do not want to end just on an entirely seemingly negative tone. We as a people know and understand the importance of energy relative to our needs of our country. We are U.S. citizens. Our North Slope Borough was founded and is funded through oil and gas. Our hope, our dream is to coexist and find a way to come together as the Arctic opens up further and further.

PREPARED STATEMENT

So this is an exciting time in terms of the potential for new commercial activities in the Arctic, and as I stated, it is also a time for great concern for us as a people that live there. We have the most to lose if any mistakes are made over there in the Arctic waters. We cannot just relocate or move somewhere. We live there. This is what identifies us as a people, and the fate of the Arctic is our fate. And I hope, Senator, you in Congress will remember this, as you determine America's new role as an Arctic nation.

Thank you very much.
[The statement follows:]

PREPARED STATEMENT OF EDWARD S. ITTA

I'm honored to be here today, and I'm grateful to you, Senator Murkowski, for the opportunity to sit on this panel. My title may be North Slope Borough mayor, but my thoughts and feelings come from a lifetime spent in the Arctic under the guidance of elders and expert hunters like my father, as well as from my own experience as a hunter and whaling captain.

As our people have observed the increasingly rapid retreat of the multi-year ice pack and other symptoms of global climate change, one thing has become clear—the Arctic is under a lot of stress. And it could be stressed further by commercial opportunities that arise as the polar ice cap shrinks. As residents of the Arctic, we are worried. As citizens of the United States, we are determined to see that human activity under these fragile conditions does not make things worse.

In the next few minutes, I'd like to share some of my ideas for making sure that a more accessible Arctic is not thrown into further imbalance by commercial and industrial activity.

The first thing I believe we need to do is to beef up the scientific research effort in the Arctic to make sure we have adequate baseline data. We have to know the status of wildlife populations and habitat before OCS development gets underway, or else we won't be able to measure and understand the impacts of activity going forward. A combined Federal, State and local framework for collaborative research and data sharing is already in place through the North Slope Science Initiative. It just needs to be adequately funded.

Responsible resource development in an increasingly fragile polar world will also require strong regulatory protections. I want to applaud Senator Murkowski for recognizing this in her proposed legislation that requires any offshore oil and gas pro-

duction to use pipelines to shore-based facilities rather than tanker transportation across Arctic waters to distant infrastructure. This is a fundamental safety precaution that must be in place in the event of OCS production.

At the same time, the Federal Government has to apply existing regulations more vigorously in the offshore leasing process. That's the only way to prevent what has happened in the past few years, when environmental reviews and other regulatory standards have been so poorly applied that it forced us into court, which is not where we want to engage with the oversight agencies.

During the past three decades, we have worked with industry in support of on-shore Arctic oil and gas development. One of the things we noticed over the years is that individual projects can have a specific set of impacts, but in combination with other nearby projects they can also have additional, cumulative impacts. We think it's important for these to be separately monitored and analyzed in the course of development, because most Arctic wildlife species migrate over vast distances and are susceptible to these cumulative changes.

When I talk about things like baseline science and cumulative impacts, I often get a lot of resistance. Some people think these kinds of protective standards are beyond what is necessary. But here's how I look at it—we have all heard widely-promoted predictions that the Arctic OCS could contain \$70 billion in resource wealth. Such vast upside potential carries with it a responsibility to use world-class safeguards that minimize any potential costs in damage to the Arctic environment and the subsistence way of life.

World-class safeguards should include zero-volume discharge requirements like they have in Norway.

Spill prevention and response measures should be viewed as a really good investment that pays dividends in avoiding the costs of a spill.

I'd also like to see a provision in Federal law that requires independent, state-licensed marine pilots on certain types of vessels crossing the Chukchi and Beaufort Seas. It's a preventive measure that makes as much sense in the Arctic as it does in Prince William Sound, where it was put in place after the *Exxon Valdez* oil spill.

These kinds of safeguards make even more sense in the Arctic than they do in development areas farther south, because the Arctic is a uniquely unforgiving place to operate. Broken ice conditions at various times of year make spill response virtually impossible, which means spill prevention is doubly important. Also, the Arctic has very little emergency response capability for an area that is so vast and remote. As we see this exploding interest in OCS resource development, marine shipping and other uses, it's pretty clear the Arctic needs a year-round Coast Guard presence and better navigational infrastructure.

This is an exciting time in terms of the potential for new commercial activity in the Arctic. It's also a time of great concern for the people who live there. We have the most to lose from mistakes that are made in Arctic waters. We can't just relocate if things go wrong, because the Arctic is our home. It defines us as a people, and its fate is our fate. I hope the Congress will remember this as you determine America's new role as an Arctic Nation.

Senator MURKOWSKI. Thank you, mayor, for your very articulate statement. I appreciate that. Thank you for being here.

Now we go to Mr. Mead Treadwell.

STATEMENT OF MEAD TREADWELL, CHAIR, U.S. ARCTIC RESEARCH COMMISSION

Mr. TREADWELL. Thank you, Senator, for having me here today to testify on the strategic importance of the Arctic in U.S. policy.

As you know, Madam Chair, in 2007, the commission recommended to the President that we conduct in this country a new Arctic policy review. The last time one had been done was 1994. That is a secret document which cannot be read by the general public, but because of the great changes we have seen witnessed in the Arctic, we thought the United States should have a new Arctic policy. That document approved is public. It is a national security presidential directive. We worked with the interagency process to see it born, but we really wanted to thank you for the extra effort we know you made to make sure it saw the light of day.

We are now working in an interagency deliberation that is working to implement this policy, and at the same time, the new administration has got an ocean policy task force which is going to give us a chance again to look at the Arctic policy and make any corrections or fixes as it goes on. And that group, with Admiral Allen and the others that he mentioned, will be meeting tomorrow. So that is a very positive thing.

In fact, yesterday I had the opportunity to join the Commandant, NOAA Administrator Lubchenco, Interior Under Secretary Hayes, and the two leaders from the White House environmental team on a flight which took us over the North Slope oil fields onshore and offshore. We released a buoy in the Arctic Ocean, saw the diminishing ice pack quite a few miles offshore. We saw a scampering polar bear on a barrier island, and we visited with North Slope Mayor Itta and his team. And thank you very much for a very nice lunch, Mr. Mayor.

Clearly on the minds of our visitors was what next do we need to do in the Arctic as Arctic policy. And Madam Chair, there is a number of goals and objectives, but I bring them down to three things: investigation, investment, and international cooperation. Let me address each of these in turn.

Investigation means research. Change in the Arctic requires a robust program of research. A global climate mitigation system, which we are working to try to develop, without Arctic and Antarctic research is like having a ship without a chart or a rudder. Research is also necessary to understand the resource potential of the Arctic and it has been mentioned before what is out there, what may be at risk from fishing or oil spills as shipping and industrial activity moves into the Arctic Ocean.

We supported the AOOS workshop last January to begin thinking about how can we have an integrated Arctic Ocean research plan. There is some legislation pending, as you know. One thing I have heard a lot from the leaders of the new administration is that they want to be able to apply a spatial planning process in the Arctic Ocean, and we cannot do that appropriately without having the baseline research that has been discussed.

Research is also necessary to help Arctic people, especially our indigenous peoples, respond to change, and while satellite pictures can show you the rapid retreat of sea ice, what you cannot see but should be just as concerned about is the rapid loss of indigenous languages spoken for thousands of years in the Arctic and with that loss, a tremendous loss of knowledge, culture, and identity goes with it.

And while we are on the subject of people, it is the commission's strong recommendation that our national health research program dig deep, much deeper than before into the causes of the suicide epidemic that takes so many native youth, not just in Alaska where the rate is four times that of the national average but across the north.

Investment. To meet our responsibilities in the changing Arctic, we need to have the means and the willingness to invest both capital and operating sums. We pay particular attention to the use of Coast Guard icebreakers, ice-strengthened research vessels, and sensor networks. We appreciate the fact that Congressman Young

has introduced an Arctic Marine Shipping Assessment Implementation Act to address this investment need and that you and Senator Begich have introduced companion bills. The big ticket icebreaker issue I will talk about in just a moment.

International cooperation. The policy of the United States also speaks directly to the need for international cooperation to accomplish many, if not all of our goals in the newly accessible Arctic. And I have heard my colleague here today talk about domestic regulation, and there are some new domestic regulations needed, but basically to make most of those stick in an ocean which is open to all, we need international cooperation. We need it in fishing. We need it in shipping, and frankly, we can have the best regulations on oil and gas on our shores, but if somebody is messing up on the other side of the Chukchi Sea, we have not done ourselves much good either. So international cooperation is needed there. It is needed with trans-boundary wildlife. We have to do a much better job supporting our co-management activities from the Arctic Eskimo Whaling Commission to the walrus group, to making the new polar bear treaty work. There is some great frustration there that I think we need to look into.

We talked about the Law of the Sea. We talked about that before. The commission has recommended that that treaty be ratified by the Senate. We are doing the work to make a claim. To answer the question that you asked the Commandant, our original estimate was that it would be about a \$75 million exercise. We are about a third year into that, spending about \$6 million to \$8 million a year. There is some more work to be done. We have learned a lot of new things in that process, and there is a long voyage just about to begin for this year's work.

We had to work with all the nations bordering the Arctic Ocean to get the same rights to research throughout the Arctic Ocean that legitimate researchers have in Antarctica. If you look at that neighborhood on that map, Senator, you will notice that it is a fairly small ocean as oceans go. Right now, I think about 12 of the last 14 times we have requested access in Russian waters to take bottom grab samples and so forth, we have been denied permission to go in with our ships. Yet, in Antarctica any legitimate researcher can go anywhere or on the margin. And that is one problem that was not addressed in the Law of the Sea and that we have been urging our nations to address internationally.

When it comes to fishing, the United States' plans for a moratorium on fishing in the high north could be much for naught unless we reach cooperation with Canada and Russia and those nations who would fish the high seas. Toward that end, the Arctic Research Commission is cosponsoring with the NPRB, the Department of State a conference here, the first international conference on Arctic fisheries, October 19-21 here in Anchorage to at least get all those issues on the table with experts.

Finally, to meet our Nation's research objectives, we not only need access throughout the Arctic but cooperation in establishing trans-boundary monitoring networks. And I will speak a little bit more to that in a moment.

So this is the Homeland Security Subcommittee of Appropriations. Let me give you a few things within the purview specifically of this committee that you might want to look at.

The commission is on record as supporting two polar-class icebreakers to replace the *Polar Star* and the *Polar Sea*, which are operating past the end of their service life. The policy of the United States—this has been a very difficult decision inside the administration. We understand the process that Admiral Allen spoke about. As a background for that process, the commission worked very hard to get a National Academy study that came up with the basic justification for the two new icebreakers. The ice is receding, but it can ridge up into conditions no other kind of icebreaker can handle besides a polar-class vessel, and we need an all-weather, all-hazards capability in the Arctic, as we do other places.

Monitoring networks, imagery and mapping, including the Sustaining Arctic Observing Network, which relies on sea, air, land, and space sensing, terrestrial and space telecommunications infrastructure. That has been discussed. It is probably the most important legacy that we will leave in the science infrastructure area after the International Polar Year. A finer mapping of Alaska in the Arctic region will assist intelligence and defense objectives, as well as emergency response to storms and wildfires. This committee should be aware of the important work done by the National Ice Center. The idea of homeland security—basically it was the homeland security needs that have helped move forward the mapping effort that is going on now. I am very glad the Governor mentioned it. The State has been a full partner in this exercise, but if not for the intelligence community weighing in as part of homeland security needs, I do not think we would be moving forward.

To underscore the importance of the Arctic observing networks, let me note this. The United States intends to embark this December with other nations on a global mitigation scheme for climate change by reducing greenhouse gas emissions. Two of the largest wild cards critical to the success of that mitigation effort involve feedbacks from the amplified air and water temperature of the Arctic region. Temperature rise can produce a massive injection of methane into the atmosphere from warming permafrost and from sources beneath the ocean. With receding ice comes a reduced albedo of the earth where much more solar radiation is absorbed by darker sea water instead of being reflected into space by whiter sea ice. An appropriate monitoring system, therefore, is a strategic asset for the world besides addressing the local issues that we have here. It is also going to allow us to have much better higher-resolution models to understand what is happening in various local parts of the Arctic, something that we found in the Arctic Marine Shipping Assessment we need very much.

Oil spill research. Perhaps the most important near-term action this subcommittee could take as a result of this hearing is to join with us to help kick start a renewed Arctic oil spill research program. Madam Chairman, I had the opportunity after the *Exxon Valdez* disaster to work with the Congress to help write the Oil Pollution Act of 1990. The law set up a robust research program, including an interagency committee to coordinate oil spill research. That committee has not met regularly. It has not kept public

records. It has not developed the kind of spill research program that the Congress expected. As a matter of oversight, we thought you should know that.

Much of the Nation's oil spill research that is conducted in the Arctic is conducted through a joint industry program in Norway. A recent test there, costing over \$10 million, showed promising results for a number of technologies, including burning, skimming, dispersants, coagulants, and bioremediation. But as Mayor Itta said, there is much more work to be done.

I am confident the Nation has the means with the Oil Spill Liability Trust Fund to fund a program that Congress asked to be developed but has not been. That fund is \$2.7 billion, replenishable from a nickel a barrel tax paid on oil imported into the United States. At present, that is about 15 million nickels a day, and at \$70 a barrel, the cost of the tax is far less than 1 percent of the cost of oil. There are innovative ways just on the way the interest on this fund is used today, including to support the Denali Commission in repairing bulk fuel tanks and the Prince William Sound Oil Spill Recovery Institute. I believe that we should have a national program of at least \$30 million to \$50 million a year, and out of that, at least a \$10 million program in the Arctic to address the issues that you have got. When you sell leases in the Chukchi for \$2.7 billion, when Mayor Itta explains to us why he feels he has to go to court, and we cannot even turn to an integrated, across-the-Government, a whole Government approach, as the Admiral said, program on oil spill research, and it is about time we had one.

There is a lot more I could say. I am going to leave time for questions. But I really appreciate the chance to be here.

And I want to conclude my testimony by passing on a comment raised by Commissioner Vera Metcalf, a resident of Nome. In her capacity as a commissioner and as director of the Arctic Eskimo Walrus Commission, Vera has worked to help the Coast Guard, moving operations north, to have closer communication with Arctic residents and Arctic communities. To quote her, "If there were a way for coastal communities to become more aware of important issues such as these, perhaps through town hall meetings, it would be helpful for us," Vera wrote. "The Bering Strait is becoming more of a portal for all ship traffic, and I am sure there is some form of high level agreement with Russia for search and rescue, but the strait is a prime strategic area."

PREPARED STATEMENT

She is right. The Bering Strait, sometimes now called the Bering Gate, is a prime strategic area and the entire Arctic Ocean is as well. Work to make sure that activity in this part of the world's oceans is safe, secure, and reliable has just begun, and we look forward to working with the subcommittee in the years to come.

Thank you.

[The statement follows:]

PREPARED STATEMENT OF MEAD TREADWALL

Senator Murkowski, thank you, Chairman Inouye and Chairman Byrd for the opportunity to testify today on the strategic importance of the Arctic and U.S. Policy.

As a member of the U.S. Arctic Research Commission¹ since 2001 and chair since 2006, I can report that our Commission shares with you the understanding that the Arctic is a vital, strategically important region of the United States—and is getting more so.

In 1867, after a bloody Civil War, the United States struggled with whether we should become an Arctic nation. Detractors of the Alaska Purchase called it “Seward’s Folly.” Russian America, which had supplied the world great quantities of whale oil and fur, was decried also as “an icebox,” a “sucked orange” with the bulk of its resources already exploited, or, my favorite, “Walrussia.” In 1959, Congress again struggled with Alaska: in the Statehood debate, a major issue was whether Alaska could support itself, and contribute to the Nation.

Today, those who think about America’s strategic interests know better. General Billy Mitchell, considered the father of the U.S. Air Force, predicted the strategic value of Alaska as the world entered the air age. An attack and occupation in the Aleutian Islands by Japan in World War II, which quieted ship and troop transport via the North Pacific’s “great circle” route, further indicated the strategic value of Alaska’s location. Since oil began flowing through the Alaska pipeline in 1977, America’s Arctic has been a major producer of energy—helping the Nation buy less from foreign sources and increasing our national security thereby. A recent USGS estimate that 13 percent of the world’s undiscovered oil and 30 percent of the world’s undiscovered natural gas is to be found inside the Arctic Circle—not to speak of the vast tidal, wind, methane hydrates and unconventional fossil fuels, coal, geothermal, hydro energy resources also to be found—strengthens the case that the United States has strategic interests here.

Clearly, our Arctic is no “sucked orange.” It is well understood that the Arctic helps feed, fuel, and defend America. Arctic fisheries, in the Bering Sea near here, or the North and Barents Sea near Iceland and Norway, lead the world in production. Global air transport criss-crosses the Arctic to link the continents, and after 500 years of exploration and imagination about Northern Sea Routes, sea transport may, soon, as well. Arctic military assets—the DEW Line, our submarines, our sensors in the air and at sea, our soldiers, sailors and airmen—stood guard during the Cold War. The missile defense installation activated recently at Fort Greely does the same—sited on northern latitude “high ground” that puts it in position to deflect inbound ballistic missiles aimed at North America from the Middle East or the Western Pacific.

In 1994, the United States issued, in secret, the first Arctic Policy written with public input. According to a press release at the time, that policy emphasized the opportunity for international cooperation to protect the environment, and led the United States to join the eight-nation Arctic Council. In 2007, our Commission recommended to the President that he conduct a new Arctic policy review—given the great changes we’ve witnessed in the North. The new Arctic Policy document approved earlier this year was the first public National Security Presidential Directive/Homeland Security Presidential Directive ever issued for this region, and it details, in response to change, a broad range of U.S. objectives in the North.² The Commission thanks you, Senator Murkowski, for the extra effort we know you made

¹ Mead Treadwell is chair of the U.S. Arctic Research Commission, www.arctic.gov. The Commission, established by the Arctic Research and Policy Act of 1984, has seven members appointed by the President to set goals for the U.S. Arctic Research Program. The director of the National Science Foundation serves as an ex-officio member of the Commission and chair of the Interagency Arctic Research Policy Committee (IARPC), which takes the Commission’s established goals and coordinates approximately \$400 million in annual Arctic research activities conducted by over a dozen federal agencies with Universities and international partners. Treadwell is Senior Fellow of the Institute of the North, founded by former Alaska Governor Walter J. Hickel. The Institute conducts research on Arctic policy, energy and fishing, infrastructure, defense and security issues. Treadwell is CEO of Venture Ad Astra, LLC, a private investment development firm. With Tim Wiepking, he co-chaired the Commonwealth North study group which published, May, 2009, *Why the Arctic Matters: America’s Responsibilities as an Arctic Nation*. <http://www.commonwealthnorth.org/index.cfm?fa=docjump&documentid=370>

² The text of NSPD-66 /HSPD-25, issued January 9, 2009, can be found at <http://www.arctic.gov/news/2009%20Arctic%20Region%20Policy.pdf>

It states that the policy of the United States is to:

- Meet national security and homeland security needs relevant to the Arctic region;
- Protect the Arctic environment and conserve its biological resources;
- Ensure that natural resource management and economic development in the region are environmentally sustainable;
- Strengthen institutions for cooperation among the eight Arctic nations (the United States, Canada, Denmark, Finland, Iceland, Norway, the Russian Federation, and Sweden);
- Involve the Arctic’s indigenous communities in decisions that affect them; and
- Enhance scientific monitoring and research into local, regional, and global environmental issues.

with the President to get that policy signed last winter and released into the light of day. We participated in the interagency deliberation that developed this policy, and we are working now with fellow agencies in the U.S. government—from the Department of State, the Coast Guard in Homeland Security, the Department of Interior, NSF and NOAA, among them—to see it implemented.

Madame Chair, there are a number of goals and objectives in the policy, but as I think of the task of implementation ahead of us for the ation, it comes down to three things, “i-words,” if you will: investigation, investment, and international cooperation. Let me address each of these in turn:

Investigation.—Change in the Arctic requires a robust program of research. Scientific research is necessary to understand climate change, and to guide the global response in both “mitigation” and “adaptation.” A global climate mitigation program without polar (Arctic and Antarctic) research to back it up would be a ship without a chart—or a rudder.

Research is necessary to understand the resource potential of the Arctic, and what may be at risk from fishing or oil spills, as shipping and industrial activity moves into the Arctic Ocean.

Research is necessary to help Arctic people, especially our indigenous peoples, respond to change. While satellite pictures can show you the rapid retreat of sea ice, what you can’t see—but should be just as concerned about—is the rapid loss of indigenous languages, spoken for thousands of years in the Arctic. With that loss, a tremendous loss of knowledge, culture and identity goes with it.

And while we’re on the subject of people, it is the Commission’s strong recommendation that our national health research program dig deep, much deeper than before, into the causes of the suicide epidemic that takes so many native youth—not just in Alaska, where the rate is four times that of the national average, but across the North.³

Investment.—An accessible Arctic Ocean requires our presence. As I’ve heard my colleague, Coast Guard Commandant Admiral Allen, say about the Arctic many times, “where there was once ice there is now water.”

We pay particular attention to the use of Coast Guard icebreakers, ice-strengthened research vessels, and sensor networks (buoys, satellites, and other elements of monitoring networks in or under the sea, on the land, in the air and in space) in Arctic research. But as was shown in the Arctic Marine Shipping Assessment, completed by the eight Arctic nations this spring, the Arctic Ocean will need aids to navigation, hydrographic mapping, search and rescue, ports of refuge, and salvage capability as this ocean becomes accessible to the world. We appreciate the fact that Congressman Young has introduced an Arctic Marine Shipping Assessment Implementation Act to address this investment need, and that you and Senator Begich have introduced companion bills.

Infrastructure investment onshore, to help our communities respond to rapidly eroding shorelines, is also necessary. As areas that were protected by ice are increasingly swamped by water, this committee and its sister appropriators have a choice to make—invest now, or send FEMA later. Our belief is you want to invest now, and we have urged an appropriate research program to guide that effort. Senator Begich, in his collection of Arctic bills introduced recently, addresses this in S. 1566, the Arctic Climate Adaptation Act.

In other words, to meet our responsibilities in the changing Arctic, we need to have the means and willingness to invest both capital and operating sums.

International Cooperation.—The policy of the United States also speaks directly to the need for international cooperation to accomplish many, if not all, of our goals in the newly accessible Arctic.

The basis of cooperation in the Arctic is not just the eight-nation Arctic Council, but the global United Nations Convention on the Law of the Sea. For several years now, our Commission has recommended that treaty be ratified by the Senate. Doing so will help extend the territory of the United States in areas where the continental shelf goes outside our 200-mile limit. Our Nation is doing the work to make a claim, but we cannot sit at the table, make our claim or comment on those being made by four other Arctic nations in this ocean, until we ratify the treaty.

We need to work with our Arctic neighbors, as well as other national partners, on other objectives as well. We should resolve our boundary with Canada in the

³The U.S. Arctic Research Commission has established five thematic goals for the Nation’s Arctic research program: Environmental Change of the Arctic Ocean and Bering Sea, Arctic Human Health, Civil Infrastructure Research, Natural Resource Assessment and Earth Science, Indigenous Language, Identity, and Culture. See http://www.arctic.gov/reports_goals.html Those goals are carried out by an interagency process, headed by the Interagency Arctic Research Policy Committee (IARPC), <http://www.nsf.gov/od/opp/arctic/iarpc/start.jsp>

Beaufort Sea region. We should work with all nations bordering the Arctic Ocean to get the same rights to research throughout the Arctic Ocean that legitimate researchers have in Antarctica. In the past several years, Russia has denied United States and other nations research vessels access inside their exclusive economic zone many times.

When it comes to shipping, the policy contemplates cooperative efforts in establishing vessel traffic rules for areas like the Bering Strait, and common efforts to provide search and rescue in the Arctic Ocean.⁴

When it comes to fishing, the United States' plans for a moratorium on fishing in the high North could be much for naught unless we reach cooperation with Canada and Russia, and those nations who would fish the high seas.⁵

When it comes to oil and gas development, in our Nation or others, a common approach to high standards is advisable, through the Arctic Council or other means. Last fall, the United States and Canada held a conference here in Anchorage, supported in part by the Commission, to compare ways we can improve Arctic oil and gas development.

Finally, to meet our Nation's research objectives, we need not only access throughout the Arctic, but cooperation in establishing trans-boundary Arctic monitoring networks. There is much work to be done in this Arctic neighborhood.

Madame Chairman, as this is the Homeland Security Subcommittee of the U.S. Senate's Appropriations Committee, let me conclude with a set of recommendations from the Commission's standing objectives that this Committee may wish to address.

Homeland Security Infrastructure.—The Commission is on record in support of building two new Polar Class icebreakers to replace the *Polar Star* and *Polar Sea*, which are operating past the end of their service life. The policy of the United States is not yet as specific, but the need for an all-weather, all conditions maritime capability is clear. Ice is receding, but it can ridge up into conditions no other kind of icebreaker can handle. Our icebreakers are used for a variety of missions—from having a national presence in the Arctic Ocean (as well as in the Antarctic), being able to provide law enforcement, border protection, fisheries enforcement, environmental and other emergency response, and search and rescue. As well, these vessels are our primary platform for Arctic Ocean research. During time of war, these ships perform the functions of a naval vessel. If we are serious about maintaining safety, security, and the natural environment of the Arctic Ocean, we must have those icebreakers. If we are serious about being sure that our own rules and those of the Law of the Sea will stick, we must have these icebreakers. We can only get them if the Congress and the President make the funding commitment.

Investments in shipping infrastructure are contemplated by the Arctic Marine Shipping Assessment Implementation Act, legislation I mentioned above that is proposed by all three members of Alaska's Congressional delegation. Those investments include aids to navigation, hydrographic mapping, spill response capability, automatic identification system receivers (AIS) to tell us when vessels are approaching, and other safety and security needs. AMSA showed us this is a new ocean for shipping, but one increasingly used today and one that could be heavily used soon.

Monitoring Networks, Imagery, and Mapping, including the Sustaining Arctic Observing Network (SAON), which relies on sea, air, land and space sensing, terrestrial and space telecommunications infrastructure. Homeland security operations in the North, as well as scientific research, depend on a common infrastructure that includes appropriate means to understand weather and climatic conditions, such as sea ice, and to communicate that information anywhere on earth. We need space and air based imagery to detect change, both on near term for emergency response, and a long-term to support research and resource management. Finer mapping of Alaska and the Arctic region will assist intelligence and defense objectives, as well as emergency response to storms and wildfires. This Committee should be aware of the important work done by the National Ice Center, a joint operation of NOAA, the U.S. Navy, and the U.S. Coast Guard, which serves mariners information about ice conditions anywhere in the world. In 2006, the Commission sponsored a workshop with telecommunications providers and researchers to understand what capabilities

⁴The Commission provided staffing for leadership of the Arctic Council's Arctic Marine Shipping Assessment (AMSA), which established an eight-nation agenda for cooperation in Arctic shipping, much of it to be accomplished before the United Nations International Maritime Organization (IMO). See http://www.arctic.gov/publications/AMSA_2009_Report_2nd_print.pdf

⁵Toward this end, the U.S. Arctic Research Commission is among the sponsors of "Managing Resources for a Changing Arctic," an International Arctic Fisheries Symposium October 19–21, 2009 in Anchorage, Alaska, designed to initiate international discussions for conserving and managing future fisheries in the Arctic Ocean, including managing migratory, trans-boundary and straddling fish stocks. <http://www.nprb.org/iafs2009/>

exist to provide data, voice and video links to and from the highest latitudes within our jurisdiction. The Iridium network, for high latitudes especially, is an important asset for operations in the Arctic—whether they are research, security, tourism, fishing, or oil and gas development offshore. The United States serves as an “anchor tenant” for that network, and it is important to understand its strategic value as next generation satellites are designed and launched.

To underscore the importance of the NSF-led program on Arctic Observing Networks, please note this: the United States intends to embark this December, with other nations, on a global mitigation scheme for climate change by reducing greenhouse gas emissions. Two of the largest “wild cards” critical to the success of that mitigation scheme involve “feedbacks” from the amplified air and water temperature of the Arctic region. Temperature rise can produce a massive injection of methane from Arctic sources, a greenhouse gas at least 23 times as potent as carbon dioxide. With receding ice comes reduced albedo of the earth, where much more solar radiation is absorbed by darker seawater instead of being reflected into space by whiter sea ice. An appropriate monitoring system is a strategic asset for the world in the objective of dealing with climate change. We need it to track how well mitigation programs are working. It will give us fair warning on other concerns as well, from shoreline erosion, change of ocean currents, ocean acidification that could damage or destroy certain fisheries.

From the Commission’s standpoint, Arctic Observing Networks are the most important legacy of the International Polar Year, and we are working through the process established in the Arctic Research and Policy Act to make sure the Senate Appropriations Committee has the specific information it needs to see a working network established. Agencies of the Department of Homeland Security, including the Coast Guard, FEMA, the National Ice Center, all will depend on this information to fulfill their missions.

Oil Spill Research Program.—Perhaps the most important near-term action this subcommittee can take as a result of this hearing is to join with us to help kick-start a renewed Arctic oil spill research program. Madame Chairman, I had the opportunity after the *Exxon Valdez* disaster to work with the Congress as it crafted the Oil Pollution Act of 1990. That law provided for a robust oil spill research program, to be coordinated by the Interagency Oil Pollution Research Coordinating Committee. (IOPRCC) It also provided authorization for funding the program through the Oil Pollution Liability Fund, which collects a nickel per barrel from all oil produced or imported into the country. As a matter of oversight, the Congress should know that today that this program is not working. Helping it work, both nationally and within the Arctic, is within your committee’s jurisdiction.

The United States has collected billions of dollars from the sale of leases for oil and gas exploration in the Beaufort and Chukchi Seas. The risk of spills in ice we might need to deal with come not just from those prospects, but from ships and fishing vessels coming through the Bering Sea and Arctic Ocean, oil drilling in other areas, including Russia and Canada.

Much of the Nation’s oil spill research relevant to this region is conducted through a Joint Industry Program in Norway. A recent test there, costing over \$10 million, showed promising results for a number of technologies including burning, skimming, dispersants, coagulants, and bioremediation. Recently Dr. John Farrell, the Commission’s executive director and I visited with the SINTEF scientists in Trondheim who lead this program, and there is more work to be done.

Likewise, the Commission recently asked former Commissioner Dr. Walter Parker to attend Canada’s Arctic Marine Oil Program (AMOP) conference, and he reported to us that current research is in sore need of significant support.

Twice in the past decade, the Commission has co-sponsored meetings of experts on Arctic spills to help develop a research agenda. While we give high credit to the work our workshop partners are doing at the Prince William Sound Oil Spill Recovery Institute in Cordova, Alaska, and the NOAA Coastal Response Research Center at the University of New Hampshire, we are concerned that no Arctic spill research program, broad scale and integrated across Federal agencies, can be said to exist.⁶

We don’t believe that a robust research program can answer every concern we’ve heard voiced about OCS development and shipping by residents of the North Slope Borough, Madame Chair, but we are confident that the Nation can do a better job

⁶See the Commission’s 2004 Workshop Report written with the Prince William Sound Oil Spill Recovery Institute (OSRI), *Advancing Oil Spill Response in Ice Covered Waters*, http://www.arctic.gov/publications/oil_in_ice.pdf Also, see the NOAA/University of New Hampshire Coastal Response Research Center’s 2008 Workshop Report, *Opening the Arctic Seas: Environmental Disasters and Framing Solutions*, issued January, 2009: http://www.crrc.unh.edu/workshops/arctic_spill_summit/arctic_summit_report_final.pdf

planning, and involving the public, in an Arctic oil spill research program. I'm also confident that the Nation has the means, with the Oil Pollution Liability Fund, to fund a program that Congress has asked to be developed but hasn't been.

Before making this statement to you, I had conversations with the leaders of NOAA and the Coast Guard, with the Governor of Alaska and his Commissioner of Environmental Conservation, with the Mayor of the North Slope Borough and leaders at the Department of the Interior, which has issued OCS leases. We have heard from the oil industry that has bought the leases and they, too, while confident they can respond appropriately now to an accident, want to see a research program in place. The law calls for it, so let's do it. We have to come together.

If the Interagency Oil Pollution Research Coordinating Committee, chaired by the Coast Guard, calls a meeting to start this process, we will help. We will do what we can to have the appropriate agency players, industry players, community leaders, and spill research specialists, including the Prince William Sound Oil Spill Recovery Institute, involved. We will take a proposal for funding, as a result of the Committee's work, to the President's science advisor and the Office of Management and Budget. We will encourage their plan to be adopted by the Interagency Arctic Research Policy Committee. We will work to help build ties between U.S. research efforts, the State of Alaska, and those of other nations. We will let you know, as the law requires, if the process is working, and we will let you know if it falls down.

Billions of dollars are at stake in the offshore Arctic with decisions pending on oil and gas exploration. Our Nation's energy security is at stake, and the Alaska pipeline is running at only one quarter of its capacity. Statistics show that spills are a greater risk from shipping and fishing vessels, and those vessels are moving north. Whatever we do as a Nation, the ships and oil and gas exploration activities of other nations may have an effect on our Arctic shores. The time to start an effective, enduring Arctic oil spill research program is now.

Homeland Security Research.—The Committee should be aware that the Department of Homeland Security supports a University Center of Excellence called CIMES (Center for Island, Maritime, and Extreme Environment Security), a partnership between the University of Hawaii, the University of Puerto Rico Mayaguez and the University of Alaska, Fairbanks.⁷ This group is looking into unique issues related to our Arctic infrastructure, and has projects to improve the use of space imaging and coastal radar for ship detection in Arctic waters. We see other areas of the Department's responsibility that could benefit from greater integration with the U.S. Arctic Research program. For example, as the Department looks at threats to critical infrastructure from an Electro-Magnetic Pulse Attack or a solar flare (the Compton effect or the Carrington effect) it should pay attention to the fact that close to 200 Alaska rural communities may have, as a result of these incidents, no power or telecommunication or air support whatsoever. As you look at the Department's plans in this area, we urge a consideration of Arctic need. Likewise, as the Department plays a major role in U.S. planning for a response to disease epidemics, such as bird flu, it can benefit from the understanding of migratory bird pathways conducted in the Arctic.

Extended Continental Shelf claim Research.—The Commission is a member of the interagency group guiding the Nation's work toward a claim for extended continental shelf under the Law of the Sea. Off Alaska alone, our claim could be greater than the size of California. We appreciate the work being done by the U.S. Coast Guard and urge full funding of this program, through several agencies.

Energy Research.—While energy research is not specifically the purview of this subcommittee, I wanted to take the opportunity, Senator Murkowski, to thank you for your help in having the National Renewable Energy Laboratory place a staffer in Alaska. The Commission urged the Department of Energy to do so, as you did. We are concerned that the Arctic Energy Office, funded through the Department of Energy's Office of Fossil Fuels, is limited in the scope of work it can pursue. Alaska's energy needs require research and experimentation in a wide-range of alternatives, based on places. Diversification of our energy supply, away from diesel, will help reduce the risk of spills. New energy sources promises to make life in some Arctic communities more economically sustainable. The U.S. Coast Guard oversees environmental issues at a large number of bulk fuel tanks throughout rural Alaska,

⁷USARC Commissioner Buck Sharpton of the University of Alaska, Fairbanks is CIMES co-chair. A description of CIMES programs may be found at <http://cimes.hawaii.edu>. This author, in his capacity as a Senior Fellow at the Institute of the North, www.institutenorth.org, has written extensively on the need for national and local planning for Electromagnetic Pulse Attack and high-energy solar flares. The Congressionally created Commission to Assess the Threat to the United States from Electromagnetic Pulse Attack, www.empcommission.org, has made specific recommendations to the Department of Homeland Security on this subject.

and alternative energy options can help reduce the Coast Guard's expense, as well as that borne by the Denali Commission and the State of Alaska, in this area. We understand the Senate Energy Committee has a hearing on these issues at Chena Hot Springs later this week, and we wanted to draw the connection with Homeland Security.

Let me conclude my testimony by passing on a comment raised by Commissioner Vera Metcalf, a resident of Nome. In her capacity as a Commissioner and as director of the Arctic Eskimo Walrus Commission, Vera has worked to help the Coast Guard—moving operations North—to have closer communication with Arctic residents and Arctic communities. “If there were a way for coastal communities to become more aware of important issues such as these (town-hall meetings?), it'd be helpful for us,” Vera wrote. “The Bering Strait is becoming more of a portal for all ship traffic, e.g., USCG and others in the region. I'm sure there is some form of high level agreement with Russia for Search and Rescue, fishing regulation, oil spills, but the Strait is a prime strategic area.”

Madame Chair, Commissioner Metcalf is right. The Bering Strait, sometimes now called the Bering Gate, is “a prime strategic area,” and the entire Arctic region is as well. Work to make sure that activity in this part of the world's oceans is “safe, secure, and reliable” has just begun. We look forward to this subcommittee's understanding and support in the years to come.

Senator MURKOWSKI. Thank you, Mr. Treadwell, and those are good words to end on, “safe, secure, and reliable.” I think that is so much of what we are attempting to do here today in raising the awareness. Whether it is with the sustainability of our fisheries or whether it is a continuation of the subsistence lifestyle of our indigenous peoples up north, whether it is the marine transportation, it all comes down to safe, reliable, and secure.

So much of what we have heard here today is how we prepare, and I think we are in almost an enviable position in many ways because we can actually prepare because we have got somewhat of a blank slate out there. In many ways, this is the last place on planet Earth where there are really no boundaries yet, and it is kind of wide open and evolving. We can be smart. We can be proactive. But it goes to the point that each one of you has raised and it is getting the information that we so desperately need, making sure that we have the research there, making sure that we are following the science and really working to prepare. From that research, you then build out, as the Commandant has said, the infrastructure so that we can respond.

Our challenge will be to make sure that we have actually put things in place before we see the level of activity increase, and I think this is some of what we are facing when we are talking about cruise ships coming through, when we are seeing a level of marine activity and commerce that simply has not been there. These are the challenges that we face.

I have a whole series of questions that I would like to ask. I am probably going to submit some in writing to you because I think they are important to include in the record.

But as you noted in Vera Metcalf's comment, she says we should be having some town halls. Well, I have a health care town hall across town that I have got to get to by 5 o'clock. So I am going to have to be keeping an eye on the time.

But I want to ask you each. So much of what we need to do, whether it is getting the funding for the icebreakers or for the research for the fisheries or making sure that we are using the science of the local people, the indigenous peoples that are there, comes down to a competition for funds. And it goes back to the question that I asked the Commandant. You have got a budget.

You have got to figure out how you are covering the mission of the Coast Guard.

Well, I think part of our challenge from an appropriations perspective—and that is the committee that we are sitting in today—it is all about making sure that people understand the need for the research, the need for what will be expensive infrastructure. How do we do a better job of really ensuring and convincing the American people that the Arctic is important? How do we do a better job of this?

And, mayor, from your perspective, how can we better utilize the human assets that we have up north, the people who are most impacted by what we will see so that we can help other people in this country understand the importance of this region?

It is a very general question, but I think it is a very real challenge for us. The people in Iowa are not connecting with what we need to be doing here, and they view my attempt to get dollars for Alaska as an Alaska issue. It is not an Alaska issue. It is an American issue. It is an Arctic issue.

But help me in how we can better promote the importance of the Arctic. And I throw that out to any of you. Mayor, you look like you are reaching for the mic.

Mr. ITTA. I am going to take a shot at it here.

I think our challenge is a matter of prioritization, to put it simply. Easier said than done, and I realize that. I think the biggest challenge is very similar to the issues we faced years ago and still face today as Alaskans. So many in America did not realize Alaska was a part of the United States and that we are U.S. citizens. I think this is a part of our challenge. How does what goes on in the Arctic relate to my life in Des Moines, Iowa? That is going to be the challenge, I think, that we face.

Tied into all of this, I think in the back of everybody's mind is the whole issue of global climate change that I think everybody has a general knowledge of it but says, oh, that does not affect me.

I think a more pointed program—I do not know that “PR” is the right word, but certainly we as a people in the Arctic with our knowledge can help any effort that the Federal Government may need, or even our State, to make what is happening in the Arctic relative to what is in the best interest of the United States of America. I think that is our biggest challenge, and it is a very difficult one for me to, just on the spur of the moment, say here is what we need to do.

But I applaud you, Senator, for the perception that you have gotten here from the testimony today, and big changes are happening. Big changes are happening in historic terms. But it is not necessarily that we see massive change day to day, but we know historic change is happening in the Arctic. The first thing we do is worry and that is normal. And it is with us and it is not too healthy, but we observe things that are changing up there. I think if you can tie that connection to what we are trying to do not just for energy or fishing or maritime transportation systems, but how does that relate to what I am doing.

So I am starting to repeat myself, so I will stop right there.

Senator MURKOWSKI. Well, I appreciate the perspective.

Mead.

Mr. TREADWELL. I think the first message is that we feed America, we fuel America, we defend America. We help bring supplies in and out of America. Tens of thousands of people a week traverse the Arctic in aircraft, and you are likely to see more of that in ships. We are having a very large debate in Congress on climate change issues. Frankly, if any of the schemes being discussed are going to work, you have to keep the Arctic cold. If you do not keep the Arctic cold, you are going to see a massive amount of extra greenhouse gases. So for those strategic reasons, you have got to pay attention to the Arctic.

Tactically, I think as David Benton has said, we have done a fairly good job in Alaska of trying to isolate and almost endow certain kinds of research projects. We have done it with the North Pacific Research Board. There is very good legislation on the North Slope Science Initiative. We are trying to find funding for it. I mentioned oil spills. There may be a way to craft that legislation as authorization legislation rather than appropriation legislation that does endow this. We have to figure out some way with the icebreakers.

And frankly, the bill that you introduced on implementation of this puts us out in the international setting. I am very glad that the eight-nation Arctic Council has several Arctic observers who are other nations. Japan, China, Korea have all applied to come in or come in as observers now. And the importance there is that as Lawson said, you will have other nations of the world looking to use the Arctic. Well, we should demand of them, help us be partners to keep it safe. So that is why I emphasize the importance of international cooperation.

But there are some endowments yet to be had that I think we can very honestly argue for. It is not earmarking sciences in Alaska. It is earmarking something that is strategic for the country.

Senator MURKOWSKI. And that argument needs to be made exceptionally clear.

Dr. Brigham or Mr. Benton, do you want to add anything to that?

Mr. BENTON. I will take a stab at that.

I am mulling over your general question because to me it really is fundamental to a problem that Alaska has across the board on many of the issues that affect our State. But this one is particularly poignant I think, because of the fact, as Mead pointed out, that the Arctic transcends the Nation. It is really a world issue. And as the mayor has pointed out, it has real consequences for cultures and traditions and people that have been around for a very long time and have a very unique place in the world.

What I was mulling over is a somewhat similar situation that we had back in—again, go back to sort of the 1980s. We were having a horrible time with our salmon fisheries being intercepted on the high seas. It was at least a North American problem, if not a global problem. But people in Kansas, people in Iowa, people in Canada, a few of them cared. Most of them did not care. People down in California and Washington and Oregon really did not care. Yet it was causing a huge problem. There was a very large fleet operating anonymously out in the middle of the North Pacific, 1,000 vessels, 30,000 miles of net a night, high seas rip net fleet.

Alaskans—and one in particular, Mr. Harold Spark, who is no longer with us, who is from Bethel—decided they had had enough and started a grassroots campaign of educating folks around the country. And the State and the Federal Government and particularly our congressional delegation joined in. And in not too long a period of time, we were actually able to get people to understand the significance of the problem by reaching out across a variety of venues.

One of the key components there was that the environmental community joined with Alaskans, and they have a way of conveying messages that are important and they can convey them well. They know how to do that.

On this one, on the Arctic issue, they are engaged, but I am not sure that they are engaged in a way that along with all the rest of us forms the kind of partnership that you are talking about or what I am getting from you that you are talking about, which is how do we elevate this in a way that it is a positive message of what we need to do. It is a call to arms, so to speak, because there are problems. But it is not just the gloom and doom stuff. It is what are we going to do about it and how are we going to do that and how are we all going to work together to get that to happen.

So the scientific community, I think the State is there. The seafood industry—I mean, we have taken our stand and I think a fairly reasonable approach. What we really need is for all the different interests to rally around the message that this is a bigger problem and maybe quit fighting so much with each other and figure out how we are going to put that message out there in a positive way that helps you get the job done.

And I would lay a gauntlet down to the environmental community when they will step up to that plate and work with the rest of us instead of sometimes—and in the case of the seafood industry, we get into a lot of quarrels every once in a while. That is legitimate, but in this one, we do not have a quarrel. I would sort of lay the gauntlet down to them on how are they going to work with the rest of the Alaskans to get that message out there and try and get some positive action.

Senator MURKOWSKI. Well, it truly is something that requires a cooperative effort amongst all sectors, but I think both Dr. Brigham—you and you, Mead, have mentioned the international cooperation that must go on, whether it is within the shipping regime or as the mayor has pointed out, there is very little room for error. And if somebody is not doing things environmentally sound on the other side of the Chukchi and there is an issue there, it does not stop at whatever border may be. We will see the implications.

And I think the recognition is that now is the time for the level of cooperation with the other Arctic nations in so many different ways, as well as within our own country as we work to try to advance the priorities that I think must move forward so that we are prepared for this new Arctic. But it will take a great deal of effort and an awareness again of the significance of the region here.

So I will put out the task to each of you, not only those of you that are testifying, but to all those that are interested. We have got a challenge ahead of us, but I think if we are proactive in building out the research, working collaboratively as we advance, whether

it is development of infrastructure or ensuring that cultures and lifestyles continue as they have for centuries, we will have something to really look back at with pride in terms of what we have developed because we acted in a manner that was proactive rather than reactive. Too much of what we do is a reactive response because it happens. Well, let us get on top of the wave here and figure out how to make it work right.

ADDITIONAL COMMITTEE QUESTIONS

Again, gentlemen, I have probably a minimum of 10 questions for each of you and may have more after this session here this afternoon that I will submit to you so that we can get those further for the record. So your homework is not quite done yet. But I thank you for not only your time and what you have given today for the record but for what each of you brings to the table on the issue of the evolving Arctic and how we can really demonstrate leadership as an Arctic nation. I look forward to working with all of you in the future as we move forward. But I thank you for your time and for those who have joined us, I thank you for your interest. We have got a lot of work to do, and I think it is good work because there is a level of excitement and opportunity, given the challenges that we face.

[The following questions were not asked at the hearing, but were submitted to the witnesses for response subsequent to the hearing:]

QUESTIONS SUBMITTED TO ADMIRAL THAD W. ALLEN

QUESTIONS SUBMITTED BY SENATOR ROBERT C. BYRD

Question. The Coast Guard established temporary Forward Operating Locations on the North Slope during the summer of 2008. What, if any, have been the challenges? What has the Coast Guard learned from this experience?

Answer. The major challenges experienced by the Coast Guard during its deployments to northern and northwestern Alaska in 2008 and 2009 are as follows:

- Vast distances. Operations in the Arctic are constrained by the time required for surface vessels and aircraft to cover vast distances to reach the Arctic Ocean.
- Lack of support infrastructure (e.g. berthing, resupply, repair facilities, suitable runways, aircraft hangars, ports and small boat launch & recovery locations, etc.).
- Lack of an effective communications network/architecture.
- Lack of accurate and timely weather forecasts/observations.
- Age, special coverage, and data fidelity/confidence of the navigation charts above the Arctic Circle are not sufficient for increased operations of surface vessels.

Significant lessons learned from those operations include:

- Existing CG small boats/short range helicopters (i.e. HH-65) tend to be ineffective due to operating conditions and geographic remoteness.
- Icebreakers or ice-hardened vessels with embarked helicopters are necessary in hazardous and dynamic ice conditions.
- Engagement with and input from the indigenous peoples is imperative for mission effectiveness. Their partnership is very valuable as we incorporate their local area knowledge into Coast Guard operations.
- Broken sea ice is prevalent and can pose a hazard to boats and ships in even the best summer conditions. Wind shifts can cause broken ice to accumulate quickly trapping vessels and making previously clear waters impassable.

Question. The Coast Guard has no designated air stations north of Kodiak, Alaska and Point Barrow, Alaska. Is search and rescue capacity in the Arctic Region needed and, if so, what Coast Guard capabilities exist to meet this demand? What additional assets would be needed to carry out this mission?

Answer. There are two Coast Guard Air Stations in Alaska: Sitka and Kodiak. During the summer, D17 maintains one HH60 helicopter at Aviation Support Facil-

ity Cordova. These operations patrol the Gulf of Alaska and the Bering Sea, but would be challenged to conduct SAR operations in the Arctic Ocean.

The Coast Guard is conducting a High Latitude Mission Analysis, an analysis of the Coast Guard's missions in the Arctic region. This report will include an analysis of requirements for the Coast Guard SAR mission in northern Alaska and Arctic region.

Question. The recession of polar icecaps is expected to make the Northern Sea Route over Russia feasible in the next 10–20 years. This route offers significant potential benefits to shippers through alternate routes. What steps has the Coast Guard taken to ensure that it has the capability and resources to address its full spectrum of missions in the Arctic?

Answer. The Coast Guard is conducting a mission analysis to examine its mission needs in the high latitude regions. The report is scheduled to be completed in June 2010.

Question. The Coast Guard may need additional icebreaker, surface, aviation, and shore assets to maintain and safeguard U.S. interests in the Arctic. Does the Coast Guard have cost estimates for this expanded role in the Arctic? If so, how was the estimate developed? If not, how will the Coast Guard go about developing a reliable cost estimate?

Answer. The Coast Guard has begun an analysis to identify mission requirements to support current and projected operations in the Arctic. The study is scheduled to be completed in June 2010 and will provide the basis for a gap analysis of Coast Guard capabilities.

QUESTIONS SUBMITTED BY SENATOR LISA MURKOWSKI

Question. Admiral Allen. Thank you for your testimony and informing us of the Coast Guard's presence and changing mission in the Arctic. You briefly mentioned that the United States Coast Guard supports ratification of the Law of the Sea Treaty? Why?

Answer. There are several key reasons why the Coast Guard supports the immediate accession to the Convention. Ninety-five percent of U.S. imports and exports are carried by water at some point. Foreign-flagged ships carry the vast majority of these products. The Convention provides a solid foundation for the effective enforcement of U.S. laws and international standards on these foreign vessels plying our waters. Joining the Convention would benefit the Coast Guard's robust port-state control efforts and further ensure that foreign ships operating in our waters are safe and secure and that they do not harm our marine ecosystem.

The Convention advances U.S. homeland and national security interests. It secures for military and commercial vessels, including Coast Guard ships and aircraft, navigational rights and freedoms throughout the world's oceans. These include the right of transit passage on, over and under international straits. Moreover, the Convention's provisions enhance the efforts of the Coast Guard to protect the security of ports used for international shipping, to enforce laws concerning maritime traffic in illicit drugs, weapons, and undocumented immigrants; illegal, unregulated and unreported fishing; and piracy.

Question. If the Senate does not ratify the treaty, how does that affect your ability to carry out your mission in the Arctic and other places?

Answer. Joining the Convention would significantly enhance the Coast Guard's ability to carry out its missions in the Arctic region and elsewhere in the U.S. 200-nautical mile exclusive economic zone (EEZ) by providing clear, internationally agreed-upon principles for operating in and governing ocean space. The Convention's provisions are consistent with U.S. marine environmental protection programs, in particular Coast Guard efforts to keep substandard and polluting vessels out of U.S. ports and coastal waters, including those in the Arctic. Failing to join the Convention would hamper many of those mission-related efforts. Additionally, the Coast Guard would not be able to make internationally secure claims on behalf of the United States to the vast living and non-living resources on the extended continental shelf in the Arctic region that includes the Bering, Chukchi, and Beaufort Seas. Remaining outside of the Convention undermines the missions of the Coast Guard and our long-term security interests.

As the U.S. representative to the International Maritime Organization (IMO), the Coast Guard has long played a leading role in developing international standards including recent efforts to improve maritime safety and environmental security through enhanced construction and operating standards for ships sailing into the Arctic. The Coast Guard is also active in the work of the Arctic Council, composed of the eight Arctic States (United States, Canada, Denmark, Iceland, Norway, Swe-

den, Finland and Russia). Being an “outsider” to the Convention hampers U.S. negotiating positions at the IMO and within the Arctic Council, regional fisheries management organizations and other international forums, making it more difficult to achieve key U.S. policy objectives.

Question. Admiral, your just briefly mentioned United States icebreaking capability. What are the next steps to increase our capability?

Answer. Coast Guard priorities at this time are to continue to study the Coast Guard’s mission requirements through the High Latitude Study, which will be received by the contractor in June 2010. The results will help the Coast Guard determine Arctic operational requirements including polar icebreaker mission requirements. However, in the interim, the Coast Guard has temporarily shifted assets to the Arctic for short periods in the summer to study cold weather impacts on equipment and assess the emerging changes in regional activity.

Question. What is the Coast Guard’s role in oil spill research and how much money does the Coast Guard spend annually on it? Should the CG have a larger budget for this and shouldn’t we be getting more money out of Oil Spill Liability Trust Fund for oil spill clean-up research?

Answer. Oil spill research and development (R&D) is primarily supported through the Coast Guard’s Research and Development Program. Following the *Exxon Valdez* spill and the subsequent passage of Title VII of the Oil Pollution Act of 1990 (OPA 90), Coast Guard oil spill R&D focused on four areas of emphasis: (1) spill response planning and management; (2) spill detection and surveillance; (3) vessel salvage and on-board containment; and (4) spilled oil cleanup and alternative countermeasures. In addition, Section 7001(a) of the OPA 90 established the Interagency Coordinating Committee on Oil Pollution Research. The purpose of the Interagency Committee remains twofold: (1) to prepare a comprehensive, coordinated Federal oil pollution R&D plan; and (2) to promote cooperation with industry, universities, research institutions, State governments, and other nations through information sharing, coordinated planning and joint funding of projects. The Coast Guard serves as the chair of this committee.

Coast Guard oil spill R&D is funded from the Coast Guard Research, Development, Testing and Evaluation (RDT&E) appropriation, of which a portion is derived from the Oil Spill Liability Trust Fund. New capabilities for responding to oil and hazardous chemical spills have been achieved from leveraging RDT&E funds in the past few years. These included manuals for fast water response, in-situ burning, enhanced chemical prediction models, and improved planning and response guidance for the Coast Guard’s Strike Teams.

The fiscal year 2010 President’s Budget includes \$560,000 to address oil spill research and requirements as a part of the RDT&E request.

Question. As you mentioned, the icebreaker *Healy* is in the Arctic Ocean again this summer doing some extended continental shelf mapping with the Canadians. How much more information do we have to do in order to make an extended continental shelf claim?

Answer. The multi-agency Extended Continental Shelf (ECS) Task Force mapping the ECS is chaired by the Department of State with co-vice chairs from the Department of the Interior and the National Oceanic and Atmospheric Administration. The Task Force is coordinating the collection and analyses of relevant data and will prepare the necessary documentation to establish the proposed claimed limits of the U.S. continental shelf in accordance with international law. Additionally, prior to submitting an ECS claim the United States must first ratify the United Nations Convention on the Law of the Sea to become a party to it. The Coast Guard provides the platform from which the mapping is conducted; however, it is not the agency that will file any ECS claims.

Question. Presently, the National Science Foundation has funding authority over the U.S. Icebreaker program. Can you give me an update on your progress to move that authority back to the Coast Guard?

Answer. The current MOA, which was an implementing agreement with respect to planning and operation and maintenance of icebreaker activities and assets, is under review as both agencies seek ways to improve management and execution of these activities.

Question. The U.S. Geologic Survey has identified significant energy resources in the off shore waters of the Chukchi and Beaufort Seas. How much does this change the mission for the Coast Guard?

Answer. The identification of potential resources in these areas does not impact Coast Guard missions. The tempo of existing Coast Guard missions might increase if and when commercial interests establish production facilities that significantly change human presence and maritime traffic in these areas. The Coast Guard has

begun an analysis to identify mission requirements to support current and projected operations in the Arctic.

Question. Do you believe that the Coast Guard, and potentially the Navy, may need a deepwater port in the Arctic?

Answer. Operational resource requirements will be determined by a variety of both internal and external studies and assessments. The Coast Guard has contracted a study of current and future Arctic and Antarctic influences and drivers and their relation to Coast Guard missions in the high latitude Polar Regions. The study will provide the Coast Guard's perspective of current and projected polar mission requirements and the gaps in capabilities needed to execute its missions in these critical regions. The expected delivery of the final report from the contractor is June 2010.

QUESTIONS SUBMITTED TO GOVERNOR SEAN PARNELL

QUESTIONS SUBMITTED BY SENATOR LISA MURKOWSKI

Question. The last administration has come out with a National Arctic Policy. Do you believe that the State of Alaska should develop a State policy as well?

Answer. While the State does not have a formal Arctic policy, we are highly engaged on Arctic issues. As the only State in the United States that extends into the Arctic Circle and borders the Arctic Ocean, this is a necessity for Alaska. A few areas where Alaska has been involved in Arctic policy include: support for a moratorium on fishing in the U.S. Arctic Ocean Exclusive Economic Zone, development and management of the State's oil and gas leasing program, participation in the Arctic Council, and the work of the State's Climate Change Sub-Cabinet. We are looking for ways to better coordinate the work of our agencies with respect to the Arctic and are considering the value of a formal policy statement.

Question. I am also looking forward to the State's climate change strategy that will be presented this fall. Do you anticipate that it will have a robust implementation process to accompany it?

Answer. The Climate Change Sub-Cabinet is working through the process of completing the Alaska Climate Change Strategy. This process will include consideration of recommendations from stakeholders and public review of a draft proposal before that draft is submitted to my office. In the meantime, the sub-cabinet has already implemented a number of key actions in urgent situations like those in coastal communities threatened by flooding and erosion. The State will support efforts in this area, but hopes to continue collaboration with local governments, Federal agencies, Alaska Native communities, academia, non-governmental organizations, and industry.

Question. You mentioned that the State of Alaska is working on coastline stabilization. I was recently able to restore the authorization for the Alaska Coastal Erosion program within the Army Corps of Engineers authority. While there is a substantial Federal funding component required, there is a tremendous need for increased funding overall. Is the State of Alaska considering spending more money to assist with this effort?

Answer. There are many Alaska communities that are at risk from erosion and flooding. Alaska's Climate Change Sub-Cabinet, chaired by Environmental Conservation Commissioner Larry Hartig, has looked closely at the needs of communities whose situation likely will be made worse by warming and other predicted effects of climate change. The Sub-Cabinet has focused their efforts on prioritizing the needs of the most at-risk communities.

The Sub-Cabinet formed an Immediate Action Workgroup specifically to make recommendations on actions that need to be taken in the near term to avoid loss of life, loss of critical services, infrastructure, or substantial loss of property in the most at-risk communities. The Governor's budget included requests for \$24.2 million in State general funds over the past two legislative sessions based on the Sub-Cabinet's recommendations for specific projects and also mitigation, planning, and permitting. The legislature has funded \$15.4 million of these general fund requests over that time period.

I am very appreciative of your efforts to restore the authorization for the Alaska Coastal Erosion program within the U.S. Army Corps of Engineers (USCOE). The State has worked closely with the USCOE and understands the tremendous need for funding in order to address the recommendations of the Climate Change Sub-Cabinet.

I am currently working with State agencies to develop the fiscal year 2011 operating and capital budgets that will be released to the public in December. Posi-

tioning us for economic development and strengthening Alaska's families continue to be my priorities. I will carefully consider the recommendations of the Climate Change Sub-Cabinet in developing the budget and how the State's efforts can best leverage Federal funding for coastal erosion.

Question. You mentioned the Department of Homeland Security and the Federal Emergency Management Agency and their inability to act on disasters that they can predict. Do you believe that Federal law must be changed in order to allow FEMA to have this new authority?

Answer. The Stafford Act governs Federal response to disasters. I believe the act is sufficiently broad in its authority to enable just such a flexibility. However, the implementing policies at FEMA seem to be written to limit action until the disaster is almost upon us. This policy has been reinterpreted in recent years as evidenced by pre-landfall disaster declarations for approaching hurricanes.

Alaska is leading a discussion among the States on "imminent" and "inevitable" disasters and will meet soon with FEMA leaders on changing the older, more rigid policies. I am confident the new leadership at FEMA will commit to working with the States to amend existing policy to acknowledge the merit of early action to save lives and property and to prevent excessive recovery costs.

Once again, thank you for the opportunity to discuss these important topics with you. If you should need any additional information, please do not hesitate to contact me.

QUESTIONS SUBMITTED TO EDWARD S. ITTA

QUESTIONS SUBMITTED BY SENATOR LISA MURKOWSKI

Question. Mayor Itta thank you for your testimony and the perspective of the Borough and residents of the North Slope.

Answer. I was honored to speak at the hearing on August 20, and I'm grateful to you, Senator Murkowski, for the opportunity to be part of this important discussion. My title may be North Slope Borough Mayor, but my thoughts and feelings come from a lifetime spent in the Arctic under the guidance of elders and expert hunters like my father, as well as from my own experience as a hunter and whaling captain.

Question. You spoke about the dramatic environmental changes that are occurring in the Arctic and how they are affecting the residents of the North Slope. How are you adapting to these changes?

Answer. We are seeing our permafrost melt. Our ice cellars are melting, which could cause real problems if this trend continues. Without ice cellars, whaling captains have nowhere to store our maqtaq for community distribution throughout the year. This scenario could require that we buy commercial frozen storage lockers and pay for their substantial power demands in order to manage the quantities of maqtaq we have to deal with.

Changing weather and ice conditions are making the spring bowhead whale hunt noticeably more dangerous. We find pockets of thin ice near the shore where, in the past, ice was 4 or 5 feet thick. This makes travel on the shorefast ice very dangerous, and there is really no way to adapt to these dangers, except to stay off the ice, which would mean abandoning our spring hunt.

We have seen a shift in wind patterns. The east wind has shifted to the northeast, which tends to keep the leads closed. Ocean currents that normally run east to west have shifted to the opposite direction, preventing leads from opening in the spring and preventing hunters from getting to the whales. By the time leads open up, we have often missed opportunities to hunt.

The spring hunt has been notably less successful. We have had to meet our subsistence needs during the fall hunt, which I believe is even more dangerous. Hunters are traveling great distances into ice-free waters now, and we have seen an increase in swells. Storms appear much more quickly now.

The ocean also seems to be warmer now. If this is true, warmer water will have an impact on the entire food chain.

Even the migration pattern of caribou seems to have changed. For example, herds normally travel from east to west. This year, the caribou were traveling from west to east. Scientific research is required to determine the long-term impacts of these behavioral shifts.

All of these changes require adaptation by our people, and some of them don't allow for adaptation. But I'm also worried about how the animals will adapt, which is also a question begging for research.

Question. Mayor Itta, as a whaling captain, how are the environmental changes you are experiencing affecting the bowhead whale migration and hunt?

Answer. My comments in response to the first question address this question as well.

Question. How would you recommend the residents of the Arctic can be more involved in the decision-making process?

Answer. Discussions that lead to policy need to involve the people of the Arctic. We want to be involved. We need to be involved. We know what is going on in the Arctic and our traditional knowledge needs to apply to the Federal Government's policy in the Arctic. People who live up here will feel the impacts of climate change and development every day. Over the next few years, our people will be faced with more competing uses close to home, and impacts will accumulate with the stepping-stone pattern of westward industrial expansion. I believe we can coexist with development, but the Federal Government needs to work with local communities to place a greater emphasis on communication, collaboration, science, traditional knowledge, and respect for subsistence.

Revenue sharing for local communities is one way to guarantee that the people most directly affected will have the capacity to participate in the official dialogue, which occurs in the context of voluminous documents to review and comprehensive comments to assemble. Our communities do not have this capacity, and it prevents their meaningful participation in the process.

No stakeholder on the North Slope can go it alone and hope to succeed. Our success in the long term will be directly linked to our ability to work together.

Question. Mayor Itta, you talked about a number of initiatives including the development of a marine harbor. I know that the harbor study was authorized in the 2007 Water Resources Development Act but that very little has been done so far. Is the Army Corps of Engineers looking at this project and how much has the borough been involved?

Answer. We have not had any specific conversations with the Army Corps of Engineers in regard to a marine harbor, but this is something the North Slope Borough would have an interest in discussing. Future discussions would have to involve the City of Barrow, Arctic Slope Regional Corporation, and all affected village corporations.

Question. You have been outspoken about your concerns for offshore energy development. What kind of role do you see the Coast Guard playing in providing you the assurances you will need that the development can be safe?

Answer. Offshore development and increasing vessel traffic point to the need for an effective U.S. Coast Guard presence. Congress should fund a year-round Coast Guard station and needed infrastructure with oceangoing and airborne response capabilities on the North Slope. The Arctic coast must have the same protections that our other coasts enjoy. A year round presence to monitor ocean activity is a must. It takes huge dollars but without the Coast Guard the Federal Government is flying blind in the Arctic.

Effective oil spill prevention and response in the Arctic Ocean are predicated on active monitoring of vessel traffic and swift emergency response capability in times of crisis. The U.S. Coast Guard plays a primary role in these activities in other coastal oil provinces, and extreme Arctic conditions justify an important role for the Coast Guard in the Beaufort and Chukchi Seas.

Increased needs for navigation aid placement, vessel traffic management, ship compliance inspections, security considerations and emergency response capability clearly suggest that enhanced Federal safety infrastructure and maritime resources need to be committed to this region. These needs include an expansion of the Marine Exchange with real-time data sharing that includes the NSB, the Barrow Arctic Science Consortium (BASC) and AEWG.

I want to thank you Senator Murkowski for stepping up to the plate an asking Congress to support funding for ice breakers in the Arctic, along with better infrastructure for navigation aids and vessel traffic management.

I am also pleased with your efforts to ensure that offshore oil and gas is not transported by tanker in the Arctic marine environment, where broken ice conditions can threaten shipping routes with little warning. A marine tanker accident like the *Exxon Valdez* oil spill in the Beaufort or Chukchi Seas would have a truly devastating impact on the Arctic marine environment and the way of life of the Inupiat on the North Slope.

I hope your legislation is able to sail through Congress, or maybe I should say, plow through the legislative process like a brand new icebreaker.

QUESTIONS SUBMITTED TO MEAD TREADWELL

QUESTIONS SUBMITTED BY SENATOR LISA MURKOWSKI

Question. How do we convince the American people that the Arctic, and what is happening in the region, is important?

Answer. Assets in the Arctic feed America, fuel America, defend America, inspire America. They maintain biodiversity for species seen less in other parts of the world. Arctic cold helps regulate the earth's climate and contain perhaps 25 percent of the world's terrestrial carbon stored within the permafrost or the boreal forest. America's Arctic is strategic not just for defense, but as a crossroads for the world's air travel today and ship travel, soon, tomorrow. Hardly any route used between North America or Europe and East Asia gets between those places without traversing some part of the Arctic airspace or sea. Even today, much North America-Asia ship traffic plies the Great Circle Route which passes north of the Aleutians.

Are these assets important? To those that understand them, of course!

To convince the American people of the importance of the Arctic, it is best to focus on both opportunities and risks. Prospects of Arctic shipping have attracted explorers to the North for over 500 years—and that opportunity, understood and pursued correctly, has attracted attention. Arctic energy prospects, estimated as huge by the recent U.S. Geological Survey report, represent another opportunity for our Nation, which is struggling to diversify and find cleaner sources of energy.

News of risks to Arctic resources, or risks to the Nation from ignoring competition and security issues in the Arctic, is another way to attract the public's attention. We hear about Russia planting a flag at the North Pole, and wonder if our own borders, prerogatives, national interests and territorial claims under the Law of the Sea will be respected. We hear about receding ice, and wonder if the critters, much less the people, who depend on the ice platform for their livelihood, will be affected. We hear about Alaska coastal villages wasting away, as the seasonal breakwall of sea ice is there less time to protect against storms (we also hear about melting permafrost, shoreside, caused in part by a warmer ocean nearby), and we wonder how those communities will survive. We hear warnings of ocean acidification, and wonder if we can reverse the trend of carbon absorption by the ocean in time to avoid effects on the food chain, and species we enjoy, such as crab. We hear about the reductions of oil flow in the trans-Alaska pipeline, and wonder if new Arctic resources can replace them to continue to reduce U.S. dependence on foreign sources.

Commissioner Vera Metcalf wrote to me, as I prepared this answer, saying, "I believe that the average American will respond to national security in the Arctic as it continues to be ice-free especially as the Northwest Passage becomes even more accessible possibly to, e.g., terrorists, drug runners, etc. Recently, we had a small boat with a family that sailed all the way from northern United States to Port of Nome through the NWP and no one was aware of this. Nothing happened, but would be a safety issue if a storm came up. Seems that we will have more of these types of activity if ice continues to diminish."

Finally, the unique features of the Arctic have their own inherent interest for the American public. During the International Polar Year, agencies supporting research—and researchers themselves—drew significant attention to their work through public and educational outreach programs. The "IPY wave" of publicity will continue as results of data collections are published. The Nation's continuing Arctic Research Program, which follows the goals set by the U.S. Arctic Research Commission, has outreach and educational components tied to most research grants or agency science.

From the Commission's standpoint, we have promoted Arctic research as necessary homework for the Nation and the world—for strategic purposes, environmental protection and understanding climate change, understanding whether mitigation approaches will work, and finding new economic opportunity. Arctic research also expands basic human knowledge about the planet, and helps us protect and maintain some of its hardest, oldest, and unique cultures.

Question. You talked about the need for increased oil spill research. How would you recommend we move forward to put together an integrated Arctic spill research plan?

Answer. The Oil Pollution Act of 1990 has all of the ingredients to produce a viable Arctic research plan, if those mechanisms are used. Some additional work by the Congress and the administration would be helpful. The Commission will shortly publish a White Paper on these issues, but specific steps to move forward are suggested here:

An Interagency Oil Pollution Research Coordinating Committee, created by the Act and chaired by the U.S. Coast Guard, needs to meet regularly, involve state en-

vironmental agencies, industry and academic institutions as it did in the beginning, and produce a regularly-updated plan. Notices of meetings, minutes, and agendas should be posted online for the public to see. Congress should exercise its oversight and OSTP should exercise its coordination powers to ensure the research provisions of OPA 90 are followed, with full participation by USCG, NOAA, MMS and other DOI agencies.

The plan should be, as suggested by an early National Academy review, prioritized to reduce the greatest risks in the chain of oil exploration, production, transport and use.

For its Arctic/subarctic work, the Committee should coordinate closely with the Commission, the Interagency Arctic Research Policy Committee (IARPC), two government funded research programs with ties to NOAA (the Prince William Sound Oil Spill Recovery Institute in Cordova, Alaska, created by OPA 90 to deal with Arctic/subarctic spill research, and the Coastal Response Research Center at the University of New Hampshire. It should work closely with Canadian efforts, including the regular Arctic Marine Oil Program (AMOP), and Norwegian efforts, including the Joint Industry Program conducted by SINTEF with—among other sources—United States and private funding. It is appropriate and necessary to involve the State of Alaska and the Boroughs of Alaska's North Slope, Northwest Arctic, western, Aleutian Coasts and Gulf Coasts where oil development is occurring or proposed, and marine transportation in Arctic/subarctic conditions is occurring.

For its work nationwide, including the Arctic, the Committee should find a "tie" to the Nation's science coordinating body, the National Science and Technology Council chaired by the White House Office of Science and Technology Policy. (We have recommended the same tie for the IARPC, and urge further coordination with the interagency processes related to marine transportation and to oceans policy overall.)

The administration and the Congress should make sure that extramural, competitive, grant funding for research is regularly available in the significant amounts contemplated by the Oil Pollution Act of 1990. The Oil Pollution Liability Fund (OPLF) has the capacity to replenish annual expenditures from the eight cent a barrel tax on all oil produced or used in the Nation. We recommend funding for all national programs at the rate of \$30 to \$50 million per year. Funding should not only be directed to technological improvements that decrease the risk or spills and improve response, but it should also make sure the basic biological assessments are conducted in areas susceptible to spills where that baseline work is not already occurring.

Given recent lease sales earning close to \$3 billion in revenues to the United States, other offshore development in Arctic/subarctic ice covered areas that will serve U.S. markets, and the increasing amount of shipping of all types occurring in the Arctic Ocean, we recommend an annual budget of \$8–10 million from the OPLF, through the USCG's competitive program, OSRI and CRRC, to meet concerns raised about the need for oil and ice research.

We endorse the approach in Senator Begich's legislation calling for the National Academy's help in reviewing research needs in this area.

We support the approach taken in legislation pending in both houses of Congress that would expand the endowment from OPLF available for OSRI funding, and believe the same funding model may be appropriate to ensure multi-year funding for oil in ice research sponsored by the Coast Guard, NOAA, and MMS.

We support the approach taken by legislation (separately introduced by the Alaska delegation; pending now as a provision in the House-passed Coast Guard Authorization Bill) to implement the findings of the Arctic Marine Shipping Assessment, and urge funding of the authorization.

Question. How do we keep the momentum of the International Polar Year going and capitalize on the volume of research that has been done?

Answer. We urge the Congress to hold a post-IPY hearing to consider scientific results of this effort, as those results come in. An appropriate time might be the summer of 2010.

We urge the Appropriations Committee to insist that the provisions of the Arctic Research and Policy Act are followed so that the Congress, the academic community and the public are specifically aware of the funding directed to Arctic research by our Nation. At this point, the ARPA requirement for a "cross-cut" budget is not regularly fulfilled, and never—for a decade or more—has a summary of Arctic research spending been presented with sufficient time for the Commission and the Congress to review.

We believe the United States has good Arctic research goals which are spawning renewed plans by IARPC in five separate areas. These plans will, if funded, be a significant legacy to the International Polar Year.

We urge the full capitalization of the Arctic Observing Network IARPC has committed to as part of the Study of Environmental Arctic Change (SEARCH) program. Congress should request specifics on capital and operating funding needs and ensure that the \$60+ million initial funding provided through NSF is followed with an operating and reporting commitment by a Federal agency charged with monitoring, probably NOAA.

Question. What do you see as the next step in Arctic Ocean scientific research?

Answer. In the same way the Nation has launched an integrated scientific effort in the Bering Sea, agencies and funding entities should come together to develop and fund such an effort in the Arctic Ocean.

We believe an MOU between NOAA, NSF, the North Pacific Research Board, OSRI, and the Navy, as a minimum, would help bring this funding effort forward.

We support the study design planning effort proposed by Senator Begich's legislation.

We believe the call for Arctic Ocean "baseline" science, discussed in the work of the President's Ocean Policy Task Force, is appropriate, and that there is significant work done already by Federal agencies, academic institutions, and industry (usually as a result of government stipulations) to serve as the foundation of that work.

We support strong integration of local and traditional knowledge, and funding of marine mammal co-management groups through NMFS and USFWS to maintain the significant research contribution these groups make.

We urge funding agencies to work more closely with CDQ groups in the Bering Sea region to include the science these groups are doing with the State of Alaska in baseline studies.

We support stronger efforts at international coordination with our neighbors, Russia and Canada. We urge the Arctic nations to work out a stable regime for access to scientific research vessels in the Arctic Ocean—researchers have that stable access in Antarctica, but access for research in the Arctic Ocean is decreasing as nations make their extended continental shelf claims. Regular bilateral science meetings at a high level to focus on Bering Sea and Arctic issues are necessary; the number of missed opportunities, missed field seasons, and cancelled voyages/expeditions has brought us to an untenable stage.

Question. As Chairman of the U.S. Arctic Research Commission, you are very familiar with the scientific research occurring in the Arctic. How do we develop the international cooperation we need for coordinated research?

Answer. The Commission has worked to fulfill its responsibility to help build scientific cooperation by being involved in existing coordinating mechanisms and helping to sponsor international workshops and science planning efforts on specific topics. We have also made field trips to meet with our science partners firsthand; including Japan, Canada, Norway, Finland, Iceland and Greenland. We have received delegations recently from Japan, China, Norway, Canada, Iceland, and Russia. We coordinate closely with the Department of State, the NSF and NOAA, among others in government. The International Arctic Research Center at the University of Alaska Fairbanks (UAF) is supported in large part through a U.S.-Japan agreement made during the Clinton Administration, and we highlighted those joint efforts during recent visits to Japan. We have a counterpart Commission in Canada that we work with closely, and other Arctic or polar coordinating groups we work with in many other nations.

For the Congress, we would like to highlight these international issues:

- As mentioned above, we have a problem of regular access in the Russian EEZ that could get worse as Russia's extended continental shelf claims are realized. An international agreement to guarantee the same access in the Arctic Ocean that is allowed in Antarctica would be an optimal approach; at the very least this issue should be raised with Russia at every opportunity and a mechanism, such as the regular bilateral meeting suggested above, would be useful.
- Full design, capitalization and operation of a Sustained Arctic Observing Network will require strong cooperation among Arctic nations and others conducting research in the region. We believe political leaders responsible for funding this program should regularly review—both in the appropriations process and in joint cooperative meetings of GEOSS, IPCC, WMO, IASC, the Arctic Council and Arctic Parliamentarians. This network will be valuable to the world as we measure greenhouse gas emissions more exactly as part of a climate change mitigation scheme.
- International educational exchange programs, including Fulbright Fellowships and exchanges through the University of the Arctic, are important to building continued collaboration in Arctic research. Congress can help long-term collaboration by supporting these programs and others like them.

Question. Do you believe we have enough funding for Arctic Research in the United States? How much more do we need?

Answer. The Commission cannot answer this question on a holistic level because the interagency cross-cut, summarizing the Arctic research budget, is not provided as required by the Arctic research and policy act. We are on record, however, as noting discrepancies between the plans of the United States to conduct Arctic research, and the absence of funding for some of those research priorities.

To highlight a few:

- The Commission has urged the United States to replace its aging polar class icebreaker fleet with at least two vessels. These vessels would not solely be dedicated to research, but would ensure the United States has an all-weather, all conditions capability for the entire suite of Coast Guard Arctic missions. We urge funding for other research infrastructure, including cabled observatories proposed in the Beaufort Sea and Bering Strait region, completion of the Barrow Global Climate Change Research Facility, and other items included in the Commission's 2007 and forthcoming 2009 goals report.
- The Commission has urged the Congress to support funding for studies by the National Academy of Sciences, Institute of Medicine, to help develop a rigorous research plan to deal with the suicide epidemic in rural Alaska. We estimate that funding need at \$1.2 to \$1.5 million for the Institute of Medicine Study, and we urge an increment in funding for suicide research at NIH, and for pilot intervention programs funded by HHS through tribal health entities and the State of Alaska.
- The Commission has urged the Congress to dedicate income and receipts from the Oil Spill Liability Fund of at least \$30 million per year, \$8–\$10 million per year directed to Arctic research, for problems of oil spills in the Arctic. An appropriation of \$450,000 to \$500,000 to support a National Academy review of research needs in this area, authorized by Senator Begich's proposed legislation, is also recommended.
- The Commission has urged creation of a significant baseline integrated Arctic Ocean study program, modeled after joint agency and North Pacific Science Board work in the Bering Sea region. We recommend NRPB and NSF be provided \$60 to \$65 million for a 5 or 6 year study to design the program with the National Academy's help, and appropriate funding thereafter.
- The Commission urges the Administration and the Congress to fund science plans developed by IARPC in response to Commission goals. New funding may be necessary to accomplish the SEARCH science plan, including the Arctic Observing Network and Arctic Ocean Science goals, Arctic Health research, an Arctic Infrastructure research program being developed (which would incorporate a wide range of infrastructure problems in the North as well as the oil spill research program urged above), a Resource Assessment Program which includes funding for the Alaska Mineral Resource Assessment Program promised in the Alaska National Interest Lands Conservation Act (ANILCA) of 1980, and a program being developed at IARPC to support indigenous language, identity and culture. That last goal was the first humanities/social science interagency goal recommended by the Commission, and we urge Congress to support more regular funding for research of this type in the Arctic.
- The Commission believes the work of wildlife co-management groups in Alaska, which contribute significant data important to management of whales, walrus, polar bears, seals, sea lions, and sea otters, should be regularly and fully funded. International support to gain similar data from Russia, once provided through mechanisms of USAID, need to be replaced in some manner, given that trans-boundary assessments are necessary to have complete data on trans-boundary populations of wildlife.

Question. The United States, through the signing of the Illulisat Declaration with the other Arctic coastal states, recognized that the law of the sea provides for the essential rights and responsibilities in the Arctic. The signing states reaffirmed their commitment to this legal framework and to the orderly settlement of any possible overlapping claims. Do you agree that the Law of the Sea Treaty is the only governance structure that we need in the Arctic?

Answer. The Law of the Sea is not the only governance structure that we have in the Arctic, but it will serve as the umbrella for most of the needs we've currently heard discussed that should be considered for ecosystem based management of this new ocean.

Among those needs are agreements to promote safe, secure and reliable shipping identified in the Arctic Marine Shipping Assessment, and authorized by the House version of the Coast Guard Authorization bill now pending. A recent conference in Anchorage discussed the need for increased scientific cooperation (and potential

international management of trans-boundary stocks or Arctic high-seas fisheries) related to Arctic fisheries that may develop with changing climate and increasing access.

The Arctic ecosystem is impacted by trans-boundary contaminants that are covered by treaties the United States has also, so far, not ratified. A new, transboundary effort or agreement to reduce soot and other short-term forcers of climate change, may also be appropriate after the Arctic Council's Task Force considers this issue further. Heavy metals and persistent organic pollutants are changing the food Arctic residents consume or produce for export. Soot, we have learned, may be responsible for the exacerbated melting of sea and glacier ice in the polar regions.

On the issue of access to parts of the ocean for researchers, the Law of the Sea grants coastal states the ability to veto research that requires a minimal, even a "grab sample" of dirt from the ocean bottom inside a nation's economic zone or extended continental shelf. Other important work, including geological drilling or bottomfish population surveys, can be impacted by these restrictions. The Commission believes a scientific agreement of some sort to define the rights of science in the region is appropriate. Stronger bilateral efforts with Russia, including agreements to address access, could also resolve the problem.

Thank you for the opportunity to respond to these questions.

QUESTIONS SUBMITTED TO DAVID BENTON

QUESTIONS SUBMITTED BY SENATOR LISA MURKOWSKI

Question. It is clear that the fishing industry is seeing some major changes in stock location. How is the industry adapting to this?

Answer. Fortunately, in Alaska industry has many of the tools it needs to adapt to changing stock distribution in existing fisheries, especially in the Bering Sea. First and foremost, fisheries that have catch share programs such as the AFA pollock fishery, the Amendment 80 flatfish fishery, the halibut/sablefish longline IFQ fishery, and the CDQ fishery have the ability to modify fishing operations to adjust to changing conditions. Catch share programs allow individual fishermen, or fishing companies, to plan fishing operations to account for longer run time to more distant fishing grounds, to avoid or adjust to weather conditions which is both a safety and efficiency issue, or in some fisheries operate within the coop structure to reduce the number of vessels involved in a fishery and thus improve efficiency.

There is also concern about the effects of climate change on stock status and the potential for overfishing. The conservative management system employed by the North Pacific Fishery Management Council provides appropriate buffers between actual catch, the Acceptable Biological Catch limits, and overfishing limits to take into account uncertainty in stock status and prevent overfishing. Management also incorporates important monitoring and enforcement programs (onboard observers, electronic vessel monitoring systems, etc.) to ensure compliance even in distant water fisheries. The result is a robust management system that is a model for sustainable fishery management.

While these are not critical issues in the U.S. Arctic at this time, if a redistribution or range extension occurs into U.S. Arctic waters, then similar tools and management measures will be important components for any sustainable fisheries program. The current Arctic FMP provides a framework for obtaining the science necessary to make such decisions in the future.

Question. As you mentioned you have been involved in a number of international fisheries agreements such as the Donut Hole Convention. You articulated what happened in that area and the risks of repeating a situation like that in the Arctic, without some kind of international agreement. Do you believe this is something we can achieve? What do you see as the sticky points in the negotiations?

Answer. Yes, I believe that we can secure international agreement to prevent a repeat of what happened with the Bering Sea Donut Hole. This would be a step wise process that would be executed at several levels concurrently. The United States should begin by initiating talks with our Russian and Canadian neighbors on a common approach to the international waters of the central Arctic Ocean. The goal of such bi-lateral and tri-lateral discussions should be to seek agreement on a moratorium in the international waters of the central Arctic Ocean north of Bering Strait and north of Svalbard. Getting agreement will not be easy, and sticking points in such talks will include concerns by both Russia and Canada of the effect of such provisions on their respective territorial claims and sovereignty. Russia will also be concerned that this may set the stage for a moratorium in their own waters, something we should assure them is not linked to what takes place in the international

waters of the Arctic Ocean. In fact, because of our shared experience with the Bering Sea donut hole, the United States should be able to demonstrate to the Russians that we have a common goal in the central Arctic.

The Canadians will have similar concerns, as well as internal issues regarding the relationship between the central government and the Native peoples of the Canadian Arctic. They will also have concerns regarding the United States/Canadian boundary in the Beaufort Sea. This can be addressed in a manner similar to how we deal with the disputed boundary in Dixon Entrance.

If we can secure agreement among these three Arctic nations that a moratorium makes sense, then a joint initiative to secure such a moratorium through appropriate international bodies should have a reasonable chance of success. For example, this could be through a United Nations resolution similar to the driftnet moratorium enacted in the early 1990s. However, the difference here would be that such a resolution should set criteria or principles for how and when fisheries might be authorized in the international waters of the central Arctic Ocean in the future. This would set the stage for future negotiations for a more comprehensive international agreement if one is deemed necessary.

At the same time, in various international fora (FAO, ICATT, etc) the United States needs to make it clear that it would be inappropriate for existing organizations such as the North East Atlantic Fisheries Commission (NEAFC) or ICES to attempt to assert jurisdiction in the central Arctic Ocean north of Bering Strait and north of Svalbard. Arctic fisheries policy needs to be led by the Arctic nations, not through fisheries organizations dominated by non-Arctic nations.

On a separate track, the United States should enter into discussions with our Russian and Canadian neighbors for bilateral agreements relating to fishery management within our respective 200 mile zones, including scientific cooperation. I do not believe that this necessarily translates into fishing moratoria in Russian or Canadian waters. But, as we learned at the Arctic International Fisheries Conference held recently in Anchorage, there is little or no commercial fishing in either Russia or Canada in Arctic waters adjacent to the U.S. EEZ. Because of this, in my view, now is the time to discuss how we can work together to meet our respective conservation and management objectives. I believe this to be particularly important with Russia, because there may be shared stocks that can become commercially viable in the near future along our common boundary in the Chukchi Sea.

As a final point, the United States must accede to the United Nations Law of the Sea. This is a critical step to protect United States interests on a range of maritime issues including Arctic fisheries.

Question. You also stated your support for the action by the North Pacific Fisheries Management Council to initiate an Arctic Fisheries Management Plan. Why is this FMP important? What level of fisheries research have we done in the Arctic and how much more do we need to do?

Answer. The Arctic FMP is important for a number of reasons. First, it affirms the conservative and precautionary approach to fisheries management that the NPFMC is well known for. The rate of change in the waters north of Bering Strait is having a profound effect on the resources and people of the region. The Arctic FMP ensures that fisheries will only be established if and when we have a good scientific understanding of the status of fishery resources in the region including the effects fisheries might have on the Arctic marine ecosystem, and only after a transparent and open decision making process that includes the people that live there. Because the situation with the Arctic is so unique, the Alaska seafood industry strongly supported the Council in developing and implementing this FMP.

The Arctic FMP is also important as a foundation for U.S. policy to address international fishery issues in the greater Arctic region. It puts the United States on sound footing when discussing the necessity for a moratorium in international waters as well as cooperative scientific and management programs with Russian and Canada.

Question. What other proactive steps can the United States take to support our commercial fisheries in the northern Bering Sea and Arctic region?

Answer. There are several steps the United States can take to support fisheries in the northern Bering Sea and Arctic regions, including:

Step up scientific research. The foundation for sustainable fisheries is a strong and ongoing stock assessment and research program to assess commercially important stocks and better understand the ecosystem functions of the marine environment. This is particularly true in these northern waters. This includes efforts to improve and expand cooperative research between the fishing industry and scientists. Cooperative research can be a cost effective way to develop innovative solutions to conservation and management needs.

Fully fund fisheries management. NOAA fishery management programs, including stock assessment programs, are routinely under funded in the President's budget. This has been true for multiple administrations, including this one. Congress has had to step in and provide funding to maintain these programs. The effects of climate change, and the need for management to have better tools and more robust data will only increase. There is a need to secure this funding as part of the base budget, and provide some measure of fiscal stability to these critical programs.

Fully fund the U.S. Coast Guard mission in the Arctic without shortchanging existing enforcement and SAR programs elsewhere in Alaska. I touched on this in my written and verbal testimony at the hearing, and will not go into detail here except to underscore the importance of the USCG mission in the North Pacific and Bering Sea where over half the Nation's fisheries landings occur, and recognize the growing pressure on the USCG as their renewed and vital mission in the Arctic Ocean continues to develop and grow.

Once again, thank you for the opportunity to provide our thoughts on Arctic fisheries and the issues that are assuming more and more importance both to Alaska but also to the Nation as a whole.

QUESTIONS SUBMITTED TO DR. LAWSON W. BRIGHAM

QUESTIONS SUBMITTED BY SENATOR LISA MURKOWSKI

Question. You mentioned some of the recommendations that are based on the findings of the report. What do you see as the next steps to get the recommendations implemented?

Answer. There are 17 recommendations based on the nearly 100 findings of the Arctic Marine Shipping Assessment (AMSA). They are organized in three inter-related themes: Enhancing Arctic Marine Safety (5); Protecting Arctic People and the Environment (8); and, Building the Arctic Marine Infrastructure (4). Some of the recommendations will be implemented by the International Maritime Organization (IMO), some by the Arctic Council and its working groups, and some by the individual Arctic states. All of the recommendations related to infrastructure will require long-term, strategic investments by the Arctic states and public-private partnerships. Implementation has begun for the following topics:

Arctic Search and Rescue (SAR) Instrument.—The Arctic Ministers in April 2009 approved the formation of a Task Force led by the United States to develop a SAR agreement including aeronautical and maritime SAR. The Task Force will report to the Arctic Council's Senior Arctic Officials.

IMO Measures for Arctic Shipping.—In June the IMO approved development of relevant mandatory measures for the Guidelines for Ships Operating in Ice-covered Waters (a current voluntary set of guidelines for Arctic ships).

The Arctic Council's working group on Protection of the Arctic Marine Environment (PAME) has begun in September 2009 drafting a follow-on plan for AMSA. During 22–24 October 2009 the University of Alaska Fairbanks (with the University of the Arctic and Dartmouth College) is hosting an international workshop titled *Considering a Roadmap Forward: The Arctic Marine Shipping Assessment*. Experts will attend from industry, Arctic governments, academe, indigenous groups and NGOs. The future of the 17 AMSA recommendations will be fully explored and a workshop report will be widely circulated within the Arctic and the global maritime industry.

Question. Many of the recommendations will require the cooperation of the other Arctic states. Do you believe that it is possible to have the necessary cooperation to get multi-lateral agreements on regulations and regimes?

Answer. To address global maritime use of the Arctic Ocean, the appropriate body is the IMO. I believe it is only through IMO that mandatory and uniform standards can be approved for Arctic ship construction, design, equipment, crewing, training and operations. Regulations for shipping to enhance Arctic marine safety and environmental protection must come from international cooperation at the IMO level. What will be critical (to the successful development of Arctic-specific regulations & conventions) is that the Arctic states must work closer together at IMO on matters of importance and common interest in the Arctic. The Arctic states can also develop their own regional agreements on such critical issues as search and rescue (SAR) and environmental response capacity. There is today the necessary Arctic state cooperation and political will to develop and implement these agreements that are of a practical maritime nature.

Question. The report makes some recommendations about infrastructure needs and investments in the Arctic. What do you see as the priorities? Why?

Answer. The following is a priority list of infrastructure requirements that are required in the Arctic and in particular, the U.S. Arctic in Alaska's coastal seas:

- Expanded Hydrographic Surveying and Charting.*—This is the most basic or fundamental requirement to enhance marine safety and marine environmental protection. Without adequate charts, most Arctic navigation will be a high risk venture.
- Establishment of an Arctic Ocean Observing System.*—Adequate circumpolar and regional environmental observations are essential to understanding Arctic climate changes and to the facilitation of marine use of the Arctic Ocean. An enhanced observing network and integrated system around Alaska's waters will greatly improve marine safety and environmental protection.
- Surveys of Indigenous Arctic Marine Use.*—Surveys of marine use by Arctic communities are critical to supporting multiple use management issues and strategies throughout the Arctic Ocean. Such regional and local surveys will provide information (sea ice and waterway uses) key to reducing potential marine user conflicts and mitigating the potential impacts of Arctic shipping.
- Comprehensive, Regional Risk Assessments.*—Risk assessments are crucial for Arctic areas such as the Bering Strait Region. Regulators, enforcement organizations, the marine industry and local communities need to understand the levels of Arctic marine activity (current and future) and the levels of risk associated with marine traffic in regions of limited infrastructure.
- Arctic Marine Traffic Awareness System.*—A circumpolar marine traffic awareness system (called for in a major AMSA recommendation) is important for monitoring and tracking of all commercial shipping in the Arctic Ocean. Data collected in near, real-time from such a system would be passed among the Arctic states to facilitate emergency response, general enforcement and the possible avoidance of user conflict.
- Oil Spill Response and Research.*—AMSA identifies oil spills (from accidental or illegal discharges) as the most significant threat from expanded Arctic marine activity. Increased research & development, international cooperation, and improved regional, environmental response plans are critical to adequately responding to greater marine use of the Arctic Ocean. In the United States, a greater emphasis on and funding of Arctic oil spill research is of the highest priority.

Question. Dr. Brigham, you were an icebreaker captain. How does U.S. icebreaker capability compare with other Arctic nations?

Answer. Two of the three ships in the U.S. Federal fleet considered polar icebreakers, the U.S. Coast Guard cutters *Polar Star* and *Polar Sea*, have operated in the Arctic and Antarctic for more than 30 years. They are in need of immediate replacement. When the Polar class ships were newer and fully operational, only the Soviet Union and the Russian Federation had more polar icebreaker capability than the United States. Russia today operates the world's largest fleet of nuclear and non-nuclear (true) polar icebreakers in support of their national interests in the vast Russian Arctic maritime region. Many of these Russian polar ships are aging and several polar icebreakers of Canada (Louis S. St-Laurent), Sweden (Oden) and Germany (Polarstern) are also older. Canada, Sweden, Finland, and Norway also operate other icebreakers that are smaller and less capable than the most powerful polar icebreakers (many operate in the Baltic and a few operate in the Arctic as well). For coastal icebreaking, these nations have capability far exceeding anything found in Alaska's coastal seas. Today the U.S. Coast Guard does not have adequate icebreaking ships to meet the future, multiple maritime needs in the shallow sub-arctic seas of the Bering Sea region and north into the coastal seas in the U.S. Arctic maritime. It is important to note that deep draft polar class icebreakers cannot usually operate in many shallow Arctic areas.

It is the current management of the U.S. Federal, polar icebreaker fleet—the authority for managing the ships is in the National Science Foundation (NSF), not in the U.S. Coast Guard—that is the serious and debatable national security issue. The NSF approach to funding polar icebreaker capability is to charter foreign polar icebreakers such as the Swedish icebreaker Oden for Antarctic operations and fund research aboard Russian polar icebreakers in the Arctic (NSF also funds Arctic research aboard the U.S. Coast Guard cutter *Healy*). This NSF strategy, supported by OMB, is considered by many as an outsourcing strategy of U.S. polar maritime interests. Many of our Federal responsibilities and national interests are being chartered to icebreakers operated by foreign nations. Unwittingly, this funding strategy allows the foreign ships to continue to be fully employed by their foreign national operating bodies. This takes place at the expense of having viable, U.S. Federal and national polar icebreaker assets. The United States has many security, legal, political, economic, environmental, and research interests in the Arctic and Antarctic

that require Federal, maritime polar capacity. The current United States funding strategy will result in the absence of a viable U.S. polar icebreaker fleet when it is most required to protect and advance our national interests in the decades ahead.

CONCLUSION OF HEARING

Senator MURKOWSKI. So with that, I again thank you all and we call this subcommittee hearing to a conclusion.

[Whereupon, at 4:31 p.m., Thursday, August 20, the hearing was concluded, and the subcommittee was recessed, to reconvene subject to the call of the Chair.]

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