Statement for the Record

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Thank you, Chairwoman Mary Landrieu, Ranking Member Dan Coats, and distinguished Members of the Subcommittee. It is a pleasure to appear before you today to discuss the resources necessary to respond to changes in the Arctic, and the United States Coast Guard's many responsibilities in Alaska.

The U.S. Coast Guard is actively engaged in missions throughout maritime Alaska. For this testimony I will focus on the Arctic and the great challenges that the Coast Guard and the nation will face in light of the environmental and human use changes we are observing. I will stress the importance of research both enabled and conducted with the support of the Coast Guard and needed by the Coast Guard to develop effective mission capabilities in this challenging environment.

Major Drivers of Change in the Arctic

Two major drivers of change in the Arctic are: (1) a warming climate with its corresponding ecosystem changes; and (2) an increased demand for the Arctic's abundant natural resources. A major result of a warming Arctic has been a significant reduction in seasonal ice cover along with a decrease in multi-season ice in the central Arctic Ocean. This has created more seasonal near shore open water and a longer potential shipping season in areas of the Arctic. These circumstances have contributed to increased interest in resource exploration and development along with more ship based tourism and seasonal marine transport. The increased human activity in the Arctic is coupled with challenges faced by Arctic communities due to increased coastal erosion, storm surge and permafrost thawing and the associated challenges to infrastructure along with concern about maintaining the quality of and access to subsistence food sources in a changing environment.

These changes in the Arctic place additional burdens on the Coast Guard to focus more efforts further North in the challenging environments of the Arctic in key missions including marine environmental protection, search and rescue, protecting marine living resources, maintaining maritime domain awareness and presence and managing ice operations. The U.S. Arctic is a challenging environment in which to perform these missions because it has little built infrastructure (for example no deep water ports), severe operating conditions, and a rapid ecosystem change.

Needed Investments in the Arctic

A significant investment in research will be necessary for the Coast Guard to understand the changing conditions successfully and their effects on its key missions and incorporate new approaches and technologies into Arctic operations. This will include robust capacity to support and understand and integrate the results of wide ranging Arctic research fields including physical oceanography, atmospheric and weather science, ecosystem analysis and social science. The Interagency Arctic Research Policy Committee (IARPC) Research Plan for 2013-2017 highlights many of the needed study directions including sea ice and marine ecosystem studies, terrestrial ecosystem studies, atmospheric studies of surface heat, energy and mass balances, observing systems, regional climate models, adaptation tools for sustaining communities and human health studies.

With respect to observing systems, new approaches to integrated Arctic monitoring are necessary some of which can be provided by unmanned systems including aircraft (from hand launched to Global Hawk) ocean surface and underwater vehicles (submarine gliders and powered) which can be used in conjunction with aircraft, ship, buoys and cabled ocean observing systems, and satellite systems. In addition, small portable and remotely powered land based systems such as small high frequency coastal radar can greatly assist in tracking ships, measuring surface currents and tracking sea ice.

Key to successful research and operations in the Arctic are ice breakers and long endurance aircraft. The Healy is the only currently operational US ice breaker in the Arctic and a crucial and unique research platform for working in and moving through ice up to 4.5 feet thick. With its 4200 square feet of lab space, sensor systems and winches the Healy can accommodate 35 scientists (up to 50 in surge capacity). The Healy is the only US government surface vessel capable of performing broad based scientific research in the northern and central regions of the Arctic Ocean. In recent years the Healy has worked collaboratively with the Canadian ice breaker St-Laurent to gather key bathymetric and seismic data critical to understanding the basis for future claims for an extended continental shelf that may be filed under UNCLOS by either Canada or Russia. In October 2012 the United States will launch the National Science Foundation funded, University of Alaska Fairbanks operated global class ice-capable research vessel R/V Sikuliaq. With its Arctic specific design the Sikuliaq will be able to break through up to 1 meter of ice and perform similar research missions. However, the Sikuliaq will not be able to operate as far north or for the length of season that the Healy can. The Sikuliaq is best seen as a complimentary vessel to the Healy. Until the Polar Star is refurbished the Healy will be the only operational US polar ice breaker. That means that in addition to its scientific mission the Healy must perform all the other key northern missions including such things as rescue and emergency escort, marine environmental protection and maintaining maritime domain awareness and protection. Even with the refurbishment of the Polar Star new ice breaking capacity will be necessary for the United States to maintain a credible long term Arctic presence and conduct effective research in ice covered waters.

Government Coordination with Research Universities

It is important that the Coast Guard and Department of Homeland Security (DHS) continue to be an active partner with federal and state research agencies and universities which conduct arctic research. These include but are not limited to partnerships with National Science Foundation, National Oceanic and Atmospheric Administration, United States Geological Service, National Aeronautics and Space Administration, Department of Defense, the Enviornmental Protection Agency, the State of Alaska, the United States Antarctic Resource Center, and US Universities including Alaska, New Hampshire, Hawaii and others. One example of a successful university/DHS collaboration with the University of Hawaii/University of Alaska Fairbanks DHS funded Center for Island, Maritime and Extreme Environment Security (CIMES). The CIMES Arctic Maritime Domain Awareness component will deliver to the Coast Guard in the summer of 2013 a demonstration of integrated satellite, UAV, and high frequency radar for collecting and analyzing "ice-water interface" data in near real-time for navigation assistance off the coast of Barrow. The purpose of the demonstration is to validate that the technologies and models created as a result of CIMES funding from DHS can directly enhance Coast Guard operations by improving the understanding between sea ice and open water, in near real-time, for: (1) search and rescue, (2) environmental protection, and (3) border security missions, in the Arctic.

In summary, the Coast Guard will play an increasingly important role in the Arctic in the upcoming decades. Increased investment will be needed in many areas of research and technology necessary to understand and respond to increased maritime activity and the changing environment. Increased investment will be needed in building and maintaining a capable ice breaker fleet, forward operating infrastructure and capacities, strong agency and university partnerships, and new technological enablers including unmanned systems and advanced sensors.