

NOT FOR PUBLICATION UNTIL  
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COMMITTEE ON SCIENCE & TECHNOLOGY

**STATEMENT OF**  
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**BEFORE THE**  
**HOUSE COMMITTEE ON SCIENCE & TECHNOLOGY**  
**ON**  
**NOAA'S CLIMATE SERVICE PROPOSAL**

**JUNE 22, 2011**

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## **I. INTRODUCTION**

Mr. Chairman, members of the committee and distinguished colleagues, I want to thank you for the opportunity to discuss with you today the Navy's interests for climatological data and information. My name is Robert Winokur and I am the Deputy Oceanographer of the Navy. The Oceanographer also holds the titles Director of Navy's Task Force Climate Change and Naval Deputy to the National Oceanic and Atmospheric Administration (NOAA). Today I am speaking about the Navy's needs for actionable climate information, how we have used climatology in the past, and how we would use projections in the future.

## **I. BACKGROUND**

Strategic planners have long used climatological records to provide guidance on weather and sea conditions at a particular place and time of year. Climatological records are based on long-term trends identified in recorded meteorological and oceanographic observations, providing a range of potential and probable conditions that could be encountered.

Since operations at sea are very susceptible to environmental conditions, a better sense of what might be experienced allows mission planners to make critical decisions that help ensure greater safety and efficiency. With proper knowledge, they can avoid planning exercises at times and in locations where high winds and seas, extreme temperatures, fog and haze, and frequent storms may make conditions unsafe for specific types of operations. Knowledge of probable wind conditions can help identify optimal windows of opportunity for near-shore flight operations. Climatology is an important component of conducting at-sea search and rescue operations and determining the best location to conduct ammunition transfers for surface ships beginning or completing extended deployments. By understanding probable sea conditions, we can route

ships to minimize fuel usage. Likewise, climatological models of the upper atmosphere allow us to route long-distance flights to maximize fuel efficiency. For our shore facilities, climatology allows us to more efficiently plan for heating and cooling costs.

The Navy has used climatological information for over 150 years, based initially on the groundbreaking work of Commander Matthew Fountaine Maury in the mid-nineteenth century. The Naval Hydrographic Office continued Maury's work, providing the Navy with climatological data until 1951, when the National Climatic Data Center in Asheville, North Carolina became the authoritative source for federal climatological data.

Increasing evidence, however, suggests that historical records will be inadequate for describing conditions of the future. While we know the climate is changing, we also know the specific details are uncertain. What we do know is that changes are magnified in the Arctic, and that will impact naval missions later this decade. The broader trends in global climate indicators point to even more changes in mission requirements in the next few decades. In fact, both *A Cooperative Strategy for 21<sup>st</sup> Century Sea Power*, the National Maritime Strategy, and the *Quadrennial Defense Review* (QDR) highlight climate change as a significant factor to be considered when anticipating naval requirements of the 21<sup>st</sup> century.

The 2010 Quadrennial Defense Review (QDR) identifies climate change as an issue that will play a significant role in shaping the future security environment, and directs the Department of Defense to take specific actions to reduce the risks associated with climate change, while also identifying climate change and energy security as “inextricably linked.” In addition, climate

change is addressed in the 2010 National Security Strategy, which states that the issue is a key challenge requiring broad global cooperation.

The QDR discusses how climate change will affect the Department of Defense (DoD) in two broad ways: first, by shaping the operating environment, roles, and missions that we undertake; and second, describing the need for DoD to adjust to the impacts of climate change on our facilities and military capabilities by constructing a strategic approach that considers the influence of climate change.

Taking into account Federal and DoD guidance, the Navy recognizes the need to adapt to climate change and is closely examining the impacts that climate change will have on its military missions and infrastructure and the information needs required to understand these impacts. In May 2009, the Chief of Naval Operations, Admiral Roughead, created a task force to provide scientifically grounded assessments and recommendations for future naval operations. Task Force Climate Change includes representatives from various naval staff and program offices and the operational fleet, with the close collaboration of the U.S. Coast Guard and NOAA.

Within the two last years the Navy promulgated two roadmaps concentrated on the Arctic and global climate change. The roadmaps guide Navy's strategy, future investment, action, and public discussion on the Arctic and global climate change. The Navy Arctic Strategic Objectives, released in May 2010, specify the objectives required to ensure the Arctic remains a region where U.S. national and maritime interests are safeguarded and the homeland is protected.

Through Task Force Climate Change, the Navy is assessing the timing and magnitude of climate change impacts on mission requirements, force structure, and infrastructure. To ensure readiness throughout the 21<sup>st</sup> century, the Navy has a need for actionable and operationally relevant climate information that improves its understanding of environmental change in order to both inform future investments and broaden cooperative partnerships, while adapting to fundamental changes.

## **II. CURRENT NEEDS**

The Arctic is one example of a critical area where the Navy has a need for accurate climate services. As stated by the Navy's Arctic Strategic Objectives, increasingly rapid environmental changes in the Arctic will make it more challenging to promote the end goal of a "safe, stable, and secure Arctic region." September 2007 was a record low in sea ice extent and the declining trend has continued -- September 2010 was the third lowest sea ice extent on record and the overall trend has shown an 11.2 percent decline per decade in seasonal ice coverage since satellites were first used to measure the Arctic ice in 1979. Perhaps more significantly, estimates from the University of Washington's Applied Physics Laboratory show that the volume of sea ice (as indicated by ice thickness) continues to decrease dramatically. September ice volume was at a record low in 2010 - 78 percent below its 1979 maximum and 70 percent below the mean for the 1979-2009 period. Regardless of changes to sea ice, the Arctic will remain ice-covered in the winter through this century and remains a very difficult operating environment.

The changing Arctic has national security implications for the Navy. The QDR identifies the Arctic as the region where the influence of climate change is most evident in shaping the operating environment and directs DoD to work with the Coast Guard and Department of

Homeland Security to address gaps in Arctic communications, domain regional awareness, search and rescue, and environmental observation and forecasting capabilities. The Navy's Maritime Strategy identifies that new shipping routes have the possibility to reshape the global transportation system. For example, the Bering Strait has the potential to increase in strategic significance over the next few decades as the ice melts, the shipping season lengthens, and companies begin to ship goods over the Pole rather than through the Panama Canal.

While the Arctic is a bellwether for global climate change, there are other impacts of global climate change that may impact peace-keeping, humanitarian assistance, and disaster relief missions. Availability of freshwater will change with the redistribution of precipitation patterns and saltwater intrusion resulting from sea level rise. Alterations in freshwater systems will present challenges for flood management, drought preparedness, agriculture, and water supply. Understanding how and when precipitation patterns will shift, or the frequency of future floods and droughts will help the Navy anticipate future threats to security, enabling it to establish mechanisms ahead of time to prevent future conflict that could be caused or exacerbated by environmental changes. The 2011 National Research Council Report requested by the Chief of Naval Operations, *National Security Implications of Climate Change for U.S. Naval Forces* recognizes these potential mission impacts and recommends Navy action to address them in six priority areas, including preparing for an increase in humanitarian assistance and disaster relief and Arctic operations, addressing emerging technical requirements, and supporting research and development.

The National Research Council report also finds that "U.S. Navy, Coastal Guard, and Marine Corps coastal installations around the globe will become increasingly susceptible to projected

climate change.” The Navy’s operational readiness hinges on continued access to land, air, and sea training and test spaces. Coastal infrastructure is particularly vulnerable because it will be affected by changes in global and regional sea level coupled with a potential increase in storm surge and/or severe storm events, and regional water resource or infrastructure challenges. Bases such as Guam and Diego Garcia provide a strategic advantage to the Navy in terms of location and logistics support. In order to limit the negative effects of climate change on sea level rise, the Navy requires access to climatological information on rates of global sea level rise and local coastal processes that will allow adaptation efforts and planning of new coastal facilities to be initiated at the right time and cost, especially for installations identified as high-risk.

Currently the Navy is conducting a Capabilities Based Assessment (CBA) for the Arctic to identify capabilities required for future operations in the region and possible capability gaps, shortfalls, and redundancies. Assessments such as these will inform Navy strategy, policy, and plans to guide future investments. Furthermore, the Office of Naval Research is making investments in its FY12 budget to improve the Navy’s capability to persistently monitor and accurately predict critical Arctic environmental changes and increase understanding of climate variability.

The Navy is actively leveraging interagency, international, and academic partnerships to ensure it has access to the best science and information and to avoid duplication of efforts. These partnerships have the added benefit of conserving resources in this fiscally constrained environment. We are participating, in coordination with appropriate DoD offices, in interagency efforts being conducted to improve coordination of climate services, including the National

Science and Technology Council's Roundtable on Climate Information and Services, co-chaired by the Office of Science and Technology Policy, the National Oceanic and Atmospheric Administration, and the U.S. Geological Survey; the National Ocean Policy's strategic action plans, particularly the plan that focuses on the Arctic Ocean; and the U.S. Global Change Research Program's National Climate Assessment, which in part are coordinating agency climate science needs and adaptation efforts across the federal government.

Finally, the Navy is jointly planning an effort with the Air Force, the National Oceanic and Atmospheric Administration, and other agencies to advance U.S. environmental prediction capability to mitigate the impact of the severe weather and answer operational requirements facing our nation. This capability will combine the forecasting skills of the Navy's and the National Weather Service's global numerical weather, ocean, and ice models to provide a better Earth Systems Prediction Capability in the next ten years.

### **III. CONCLUSION**

Part of the military mission is to anticipate threats and changes to national security. Climate change, and its interaction with and impacts on demographics, technology, globalization, and resource allocation and management, will be one of the drivers of security in this century. It is in this spirit that the Navy has identified its needs for improved understanding of a changing global environment.

The Navy's role and responsibility regarding climate services would be as a customer; using the information for tactical, operational, and strategic planning and execution; and to provide



feedback to those organizations that provide the services so that they might continue to improve them. It is outside the Navy's purview to comment on what agency should provide climate services to the Federal government, how they should carry out the collection and dissemination of climate services, and what level of funding is necessary to carry out this effort.

The Navy recognizes the need to better understand the processes that are affecting the Earth's climate, predict how the climate will change in the future, and anticipate the security risks that may arise. The Navy is focused on readiness and adaptation, while reducing the risk to vulnerable facilities, training our forces to be prepared for any future missions operating in environments that much of the Navy has not regularly seen.

Thank you Mr. Chairman. I look forward to answering any questions the Committee may have.