Statement by

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on

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Introduction

The Department of Defense (DoD)'s primary responsibility is to protect our nation's security interests around the world. This includes building security globally through assurance of allies, engagement with partners, and deterrence of adversaries; prevailing in conflicts should they arise; and supporting civil authorities and others around the world in times of emergency. To ensure DoD is adequately prepared to accomplish our missions, we need to consider all aspects of the global security environment and plan appropriately for potential contingencies and the possibility of unexpected developments in both the near- and longer-terms.

As such, the Department tracks, analyzes, and considers a range of current and future trends and changes, including political-military, economics, demographics, technology, and the environment. All of these issue areas have the potential to significantly impact U.S. national security interests in both positive and negative ways. DoD must take into account these trends to ensure we are able to create and pursue opportunities when they serve our national interests and that we are ready for a wide range of challenges now and into the future.

This is why climate change is included in the 2014 Quadrennial Defense Review. In particular, we noted that: "The impacts of climate change may increase the frequency, scale, and complexity of future missions, including defense support to civil authorities, while at the same time undermining the capacity of our domestic installations to support training activities." The effects of climate change – such as sea-level rise, shifting climate zones, and more severe weather events – will have an impact on our bases and installations at home and overseas; on the operating environment for our troops, ships, and aircraft; and on the global security environment itself as climate change affects other countries around the world.

While all projections contain a degree of uncertainty, the Department considers risk across a wide spectrum of possibilities to ensure DoD is appropriately prepared for the range of possible contingencies. In considering the effects of climate change, scientific data and studies are used to further refine projections and planning. The Department also continues to update and assess this work to ensure that changes are taken into consideration so that plans and capabilities can be adapted, when needed.

Near Term: Infrastructure, Training, and Testing

The National Climate Assessment, released by the White House earlier this month, noted that the world's climate is already rapidly changing. Certain types of weather events are already occurring more frequently and intensely, including heat waves, heavy downpours, hurricanes, floods, and droughts. Glaciers and Arctic sea ice are melting at a relatively rapid rate, sea levels are rising, and oceans are becoming warmer and more acidic. Moreover, scientists predict that some of these changes will increase in frequency, duration, and intensity over the next 100 years.

Some of these current effects of climate change are being seen on the military bases, installations, and other infrastructure that DoD manages. Our infrastructure serves as the staging platform for the Department's national defense and humanitarian missions, and the natural landscape supports military combat readiness by providing realistic combat conditions and vital resources to personnel. For example, an installation may need a forest or desert landscape for maneuvers, coastal waters for amphibious assault training, or wetlands to prevent flooding and erosion. The effects of climate change will have serious implications for the Department's ability to maintain both its infrastructure and the landscape around it, and to ensure military readiness in the future.

Our coastal installations are already experiencing increased flooding and damage from sea-level rise and increased storm surge; longer-term impacts could include increased inundation and erosion. Rising temperature and extreme weather will increase building heating and cooling demand, raising installation energy requirements and operating costs. Those conditions will also increase maintenance requirements for runways and roads, as well as cause disruption to and competition for reliable energy and fresh water supplies. Thawing permafrost and melting sea ice are damaging our infrastructure in Alaska and the Arctic region. Changed disease vector distribution, particularly exposure to diseases in regions in which they are not routinely encountered, will increase the complexity and cost of on-going disease management efforts, and may have acute and long-term impacts on personnel health and safety.

The Department also needs to be able to train our forces to meet the evolving nature of the operational environment by training in the field environment to achieve and sustain proficiency in mission requirements. The Department conducts testing in the field environment in anticipation of the military's use of weapons, equipment, munitions, systems, or their components. As such, access to the land, air, and sea space that replicate the operational environment for training and testing is critical to the readiness of the Force.

The impacts of climate change may decrease the capacity of DoD properties to support current testing and training rotation types or levels. Some training and testing lands may lose their carrying capacity altogether. Rising temperatures could lead to an increased number of "black flag" (suspended outdoor training) or fire hazard days. Increased dust generation during training activities may interfere with sensitive equipment, resulting in greater repairs, or may require more extensive dust control measures to meet environmental compliance requirements. These conditions could also lead to increased health and safety risks to the Department's personnel.

Climate change also impacts may affect the supplies, equipment, vehicles, and weapons systems the Department buys, where and from whom we buy them, how they are transported and distributed, and how and where they are stockpiled and stored. Changes to the operating environment may require changes to operational parameters for current and planned weapons and equipment, resulting in increased associated maintenance requirements or requirements for new equipment.

Environmental changes may introduce supply-chain vulnerabilities, reducing the availability of or access to the materials, resources, and industrial infrastructure needed to manufacture the Department's weapon systems and supplies. They may also cause the interruption of shipment, delivery, or storage and stockpile of materials or manufactured equipment and supplies. Many major corporations have recognized the potential effects of climate change on their operations and are aggressively pursuing manufacturing/supply resiliency efforts. As appropriate, the Department will seek refinements to existing processes and develop new climate-specific plans and guidance.

Because of these current and ongoing concerns, the Department initiated in 2013 a review of existing directives, policies, manuals, and associated guidance documents and criteria to identify which ones should incorporate considerations of a changing climate. The initial screen reviewed 58 documents and identified 28 policies, programs and procedures for update; five have already been updated, all dealing with installations. During 2014, the Department will work within the existing review and update cycle to establish a plan for incorporating appropriate consideration of climate change into the relevant documents.

Many infrastructure managers are already adapting to changing climate factors. Reported rebuilding efforts after extreme storms include upgrading to more wind-resistant structures, burying utility lines underground, changing storage locations for chemicals used in low-lying

wastewater treatment plants, protecting water supply wells, and removing vulnerable trees. In preparation for the possibility of more wildfires, installations reported preparing better firebreaks and making timber stand improvements to reduce fire fuel loads.

The Department has updated our master planning criteria for installations to require the consideration of climatic conditions, as well as mandating the consideration of changing climate conditions when designing buildings, including potential increased heating or cooling requirements. We also issued a Floodplain Management Policy in February 2014 that establishes requirements to minimize risks when military assets must be located within flood plains.

The Department is exploring the expansion of applications of risk management schemes already in use, primarily within the Defense Critical Infrastructure Program. Decisions on where and how to locate future infrastructure will become increasingly reliant on robust risk management processes that account for dynamic factors associated with the effects of climate change. While the initial modifications to risk management methodologies are focused on critical infrastructure, it is anticipated that the Department will utilize them across all decision-making in the future.

The Department has initiated several research and survey efforts to more fully identify and characterize vulnerabilities, impacts, and risks posed by climate change. The Department is implementing a phased installation-level vulnerability assessment approach to: develop methodologies for conducting consistent screening-level vulnerability assessments of military installations world-wide (starting with coastal and tidal installations); leverage recent scientific advancements regarding coastal assessment; and provide a platform to build upon prior to conducting more comprehensive and detailed assessments, whether coastal installations or otherwise.

A screening level survey assessment tool was piloted in the Fall of 2013 and was deployed in 2014 to assess current installation-specific vulnerability to the impacts of climate-related events. Data from these screening-level assessments will be used to identify areas and installations where more detailed vulnerability assessments may be needed. The Department is using a whole-of government approach to develop recommendations on regional sea-level rise for use in more detailed coastal vulnerability and impact assessments of military installations worldwide, to ensure consistency in conducting these assessments.

As climate science advances, the Department will regularly reevaluate climate change risks and opportunities in order to develop policies and plans to manage its effects on the Department's operating environment, missions, and facilities. Research organizations within the Department, including the Strategic Environmental Research and Development Program (SERDP), are planning and completing studies to characterize climate change impacts in specific regions of the world and develop and pilot vulnerability assessment and adaptation methodologies and strategies.

Research to develop coastal assessment methods is scheduled for completion during 2014. Work in other regions is still underway, including research designed to understand how increased temperature trends and changes in the fire regime in the interior of Alaska will impact the dynamics of thawing permafrost and the subsequent effects on hydrology, access to training lands, and infrastructure; and how changes in storm patterns and sea levels will impact the Department's Pacific Island installations, including their water supplies.

The Department is actively conducting research that will support further integration of climate change into our considerations. This includes projects that: assess potential changes in the intensity, duration, and frequency of extreme precipitation events, including changes in the timing and intensity of snowmelt and subsequent run-off events; include development of

adaptive decision frameworks; and address understanding the characteristics of species that are either conservation reliant or adaptable to potential changes in climate and human activities.

Longer-Term: Plans and Operations

The longer-term impacts of climate change may alter, limit, or constrain the environments in which our military will be operating. For example, sea level rise may impact the execution of amphibious landings; changing temperatures and lengthened seasons could impact timing windows for operations; and increased frequency of extreme weather could impact assumptions about flight conditions that could affect intelligence, surveillance, and reconnaissance capabilities.

The impacts of climate change may aggravate existing or trigger new risks to U.S. interests. Maintaining stability within and among other nations is an important means of avoiding full-scale military conflicts. The impacts of climate change may cause instability in other countries by impairing access to food and water, damaging infrastructure, spreading disease, uprooting and displacing large numbers of people, compelling mass migration, increasing competition for natural resources, interrupting commercial activity, or restricting electricity availability.

As Secretary of Defense Chuck Hagel said at the 2013 Halifax International Security Forum, "Climate change does not directly cause conflict, but it can significantly add to the challenges of global instability, hunger, poverty, and conflict. Food and water shortages, pandemic disease, disputes over refugees and resources, more severe natural disasters – all place additional burdens on economies, societies, and institutions around the world."

These developments could undermine already-fragile governments that are unable to

respond effectively or challenge currently-stable governments, as well as increasing competition and tension between countries vying for limited resources. These gaps in governance can create an avenue for extremist ideologies and the conditions that foster terrorism.

As a Department, we are working to better understand how the impacts of climate change will affect plans and operations in the U.S. and abroad. The Department's unique capability to provide logistical, material, and security assistance on a massive scale or in rapid fashion may be called upon with increasing frequency. We are looking to identify early warning indicators for those areas critical to DoD's mission set, as well as conduct systematic regional and localized impact assessments to identify trends and where our resources should be focused.

The Department will be monitoring these developments and deciding which situations will require intervention based on U.S. security interests – either preemptively through security cooperation and capacity building, or through stability operations if conditions escalate. We are exploring ways for the combatant commands to include in their missions non-combat support to address serious climate change-related U.S. national security vulnerabilities and to include climate considerations in their theater campaign plans.

We are currently working to integrate the impacts of climate change into our longer-term planning scenarios, which articulate a range of future challenges that U.S. military forces must be prepared to confront. These scenarios support deliberations by DoD senior leadership on strategy and planning, programming, budgeting, and execution (PPBE) matters, including force sizing, shaping, and capability development.

We also plan to more fully integrate the impacts of climate change into our humanitarian assistance/disaster relief and other exercise plans, and are working to enhance the capacity of

partner militaries and civil response readiness groups to plan for, and respond to, natural disasters. As noted in the 2014 QDR, "Climate change also creates both a need and an opportunity for nations to work together, which the Department will seize through a range of initiatives."

We also hope to more systematically harness resources beyond the traditional combatant command structure. This included the National Guard, and its State Partnership Program, service engineering units such as the U.S. Army Corps of Engineers and Naval Facilities Command, and OSD-led programs such as the Defense Environmental International Cooperation Program and the Strategic Environmental Research and Development Program.

To the extent that we are engaged in the construction of military and civilian infrastructure for partner nations, we are working to include consideration of climate change impacts on all our projects, ranging from site selection to resiliency planning.

Here in the U.S., state and local governments responding to the effects of extreme weather may seek increased defense support to civil authorities. The heightened demand, particularly on the National Guard and Reserve Component, could impact their availability for other contingencies or operations. We are in the process of exploring these implications and finding the right balance to ensure that our domestic needs can be met.

The Arctic

The effects of climate change are particularly acute in the Arctic region. Profound changes are already occurring that are having and will continue to have significant and long-lasting consequences. Over the coming decades, the Arctic will remain a remote, isolated, and complex environment; but over time, diminishing sea ice will make the Arctic Ocean

increasingly accessible and used by Arctic as well as non-Arctic nations. At the same time, land access—which depends on frozen ground in much of the Arctic—will diminish as permafrost thaws.

Although some recent media reporting overstates the nature of current human activity and potential for military conflict in the near term, the U.S. government, including DoD, must account for and closely monitor the long-term dynamics in the Arctic. Regardless of the rate and scale of change, we must be ready to contribute to national efforts in pursuit of strategic objectives in the region.

In response to these changing dynamics, the Department released a DoD Arctic Strategy in November 2013. The DoD Strategy supports the overarching national approach to the Arctic, embodied in the National Strategy for the Arctic region (released in May 2013): advancing U.S. security interests, pursuing responsible Arctic region stewardship, and strengthening international cooperation.

In accordance with the National strategy, the DoD Strategy seeks to preserve an Arctic region that is free of conflict, in which nations act responsibly and cooperatively, and where economic and energy resources are developed in a sustainable manner. In order to do so, we will ensure security, support safety, promote defense cooperation, and prepare for a wide range of challenges and contingencies.

The DoD Strategy recognizes that the U.S. government response to changes in the Arctic requires a whole-of-government approach. In terms of preserving security, the U.S. Coast Guard in particular faces distinct near-term challenges. DoD continues to seek opportunities to coordinate our responses with the Coast Guard to leverage existing resources and avoid duplication of effort. We also continue to prepare ourselves to provide defense support for civil

authorities when directed.

Our Arctic strategy will enable us to take a balanced approach to improving human and environmental security. Our challenge is to balance the risk of having inadequate capabilities or insufficient capacity appropriate for this changing region with the opportunity cost of making premature and/or unnecessary investments. We assess that the Arctic is a relatively low threat environment, and that existing DoD infrastructure and capabilities in the region are adequate to meet current U.S. defense needs in the near and mid-term future.

Capabilities and requirements will need to re-evaluated as conditions and regional activity change, and any gaps will need to be addressed. Given the low potential for armed conflict in the region, a buildup beyond what is required for existing DoD missions could send the wrong signal about our intentions for the region. We will continue to train and operate routinely in the region as we monitor the changing environment, revisit threat assessments, and take appropriate action as conditions change.

Given the nature of the Arctic, our approach to the region requires more than just interagency cooperation, it requires international cooperation. As we highlight in the 2014 QDR, relationships with allies and partners are important enablers for meeting our security and defense commitments. Our strategic approach to the Arctic reflects the relatively low level of military threat in a region bounded by nations that have not only publically committed to working within a common framework of international law and diplomatic engagement, but have also demonstrated the ability and commitment to do so.

We engage in frequent consultations with our Arctic partners, including through the Arctic Council, Northern Chiefs of Defense conference, the Arctic Security Forces Roundtable, and in Service-to-Service dialogues and exercises. Russia, one of five coastal Arctic states, has

historically played a collaborative role in these forums. Although our near-term cooperation with Russia has been impacted by Russia's ongoing intervention in Ukraine, we continue to work with other Arctic partners and remain committed to the long-term objectives, approaches, and capabilities outlined in the Arctic Strategy.

Interagency Collaboration on Climate Change

Partnerships are needed to fully ensure the Department's mission is sustainable given the effects of climate change. The Department cannot effectively assess its vulnerabilities and implement adaptive responses at its installations if neighbors and stakeholders are not part of the process. The Department's decisions and those of neighboring communities are intrinsically interconnected. Aspects of our mission, such as Force deployment, may be affected by assets outside our control, such as transportation infrastructure.

Understanding the complexities and uncertainties of climate change require a whole-of-government approach as well. Therefore, the Department already participates in nationwide efforts such as the U.S. Global Change Research Program, including the National Climate Assessment. It also partners with individual agencies such as the National Oceanic and Atmospheric Administration on, for example, the development and operational implementation of a national Earth System Prediction Capability.

The Department is also represented on interagency climate change councils and working groups and will continue to participate in federal climate partnerships and other interagency processes. The Department, through the Air Force Weather Agency, contributes earth-space environmental data, receiving nearly 500,000 weather observations and satellite-derived wind profiles each day and sharing these data with the National Climatic Data Center and the Navy's

Fleet Numerical Meteorological and Oceanographic Center.

Climate change is an inherently global problem, and will require us to work closely with our allies, partners, and other countries across the world. As such, the State Department is leading our efforts to engage with the international community on these issues in multilateral forums and in bilateral relations. DoD is collaborating with and supporting the State Department in many of these initiatives, and we are continuing to develop new mechanisms and avenues for cooperation.

Conclusion

The effects of the changing climate affect the full range of Department activities, including plans, operations, training, infrastructure, acquisition, and longer-term investments. The direction, degree, and rates of the physical changes will differ by region, as will the effects to the Department's mission and operations. By taking a proactive, flexible approach to assessment, analysis, and adaptation, the Department can keep pace with the impacts of changing climate patterns, minimize effects on the Department, and continue to protect our national security interests.