

**NATIONAL SECURITY IMPLICATIONS OF CLIMATE-RELATED
RISKS AND A CHANGING CLIMATE**

This report responds to the Congressional request to the Department of Defense to identify the most serious and likely climate-related security risks for each Combatant Command, the ways in which the Combatant Commands are integrating mitigation of these risks into their planning processes, and a description of the resources required for an effective response.

Submitted in response to a request contained in Senate Report 113-211, accompanying H.R. 4870, the Department of Defense Appropriations Bill, 2015.

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Response to Congressional Inquiry on National Security Implications of Climate-Related Risks and a Changing Climate

July 2015

Elements of Request for Report

This report responds to the request by the Senate Committee on Appropriations for information on the *National Security Implications of Climate Change* made in the report to accompany H.R. 4870, the Department of Defense (DoD) Appropriations Act for the fiscal year ending September 30, 2015. Specifically, the Committee requested that the Under Secretary of Defense for Policy provide a report to:

- ❖ Identify the most serious and likely climate-related security risks for each Combatant Command.
- ❖ Identify ways Combatant Commands integrate risk mitigation in their planning processes, including in the areas of:
 - Humanitarian disaster relief;
 - Security cooperation;
 - Building partner capacity; and
 - Sharing best practices for mitigation of installation vulnerabilities.
- ❖ Describe resources required for an effective response and the timeline of resources needs.

This report is organized into three primary sections:

- I. Common Conceptions of Risk and Response
- II. Geographic Combatant Commands (GCCs) - Specific Aspects
- III. Conclusion

I. Common Conceptions of Risk and Response

DoD recognizes the reality of climate change and the significant risk it poses to U.S. interests globally. The National Security Strategy, issued in February 2015, is clear that climate change is an urgent and growing threat to our national security, contributing to increased natural disasters, refugee flows, and conflicts over basic resources such as food and water.¹ These impacts are already occurring, and the scope, scale, and intensity of these impacts are projected to increase over time.

The Department's defense strategy, as reflected in the 2014 Quadrennial Defense Review (QDR), emphasizes three pillars: protect the homeland, build security globally, and project power and win decisively. A changing climate increases the risk of instability and conflict overseas, and has implications for DoD on operations, personnel, installations, and the stability, development, and human security of other nations. This is why DoD released the Climate Change Adaptation Roadmap (CCAR) in October 2014. The CCAR identifies three overarching goals: to identify and assess the effects of a changing climate on the Department's infrastructure, mission, and activities; to identify, manage, and integrate climate change considerations across the full range of Department missions and activities; and to collaborate with internal and external entities on understanding and assessing the challenges of a changing climate and developing appropriate responses to those challenges.

Geographic Combatant Commands (GCCs) incorporate the risks posed by current and projected climate variations into their planning, resource requirements, and operational considerations. GCCs, often at the request of partner nations, cooperate with other nations on adaptation practices, resilience, environmental considerations, and risk reduction.

Climate-Related Security Risks

Global climate change will have wide-ranging implications for U.S. national security interests over the foreseeable future because it will aggravate existing problems—such as poverty, social tensions, environmental degradation, ineffectual leadership, and weak political institutions—that threaten domestic stability in a number of countries. Each GCC's assessment of risk reflects how this range of factors will affect security in its Area of Responsibility (AOR). GCCs generally view climate change as a security risk because it impacts human security and, more indirectly, the ability of governments to meet the basic needs of their populations. Communities and states that are already fragile and have limited resources are significantly more

¹ National Security Strategy, White House, February 2015.

vulnerable to disruption and far less likely to respond effectively and be resilient to new challenges. Case studies indicate that in addition to exacerbating existing risks from other factors (e.g., social, economic, and political fault lines), climate-induced stress can generate new vulnerabilities (e.g., water scarcity) and thus contribute to instability and conflict even in situations not previously considered at risk.

GCCs have identified four general areas of climate-related security risks:

- **Persistently recurring conditions such as flooding, drought, and higher temperatures** increase the strain on fragile states and vulnerable populations by dampening economic activity and burdening public health through loss of agriculture and electricity production, the change in known infectious disease patterns and the rise of new ones, and increases in respiratory and cardiovascular diseases. This could result in increased intra- and inter-state migration, and generate other negative effects on human security. For example, from 2006-2011, a severe multi-year drought affected Syria² and contributed to massive agriculture failures and population displacements. Large movements of rural dwellers to city centers coincided with the presence of large numbers of Iraqi refugees in Syrian cities, effectively overwhelming institutional capacity to respond constructively to the changing service demands. These kinds of impacts in regions around the world could necessitate greater DoD involvement in the provision of humanitarian assistance and other aid.
- **More frequent and/or more severe extreme weather events** that may require substantial involvement of DoD units, personnel, and assets in humanitarian assistance and disaster relief (HA/DR) abroad and in Defense Support of Civil Authorities (DSCA) at home. Massive flooding in Pakistan in 2010 was the country's worst in recorded history, killing more than 2,000 people and affecting 18 million; DoD delivered humanitarian relief to otherwise inaccessible areas. Super Storm Sandy in New York and New Jersey in 2012 resulted in over 14,000 DoD personnel mobilized to provide direct support, and at least an additional 10,000 who supported the operation in various capacities in the areas of power restoration, fuel resupply, transportation infrastructure repair, water and meal distribution, temporary housing and sheltering, and debris removal. The need for HADR and DSCA will likely rise as cities expand to encompass the majority of the global population and because flood risk threatens more people than

² Peter Gleick, "Water, Drought, Climate Change, and Conflict in Syria," Pacific Institute, February 2, 2014.

any other natural hazard, especially in urban areas.³ Many growing cities are located in low- and middle-income countries with limited resources. Building partner nation capacity for HA/DR capabilities and civilian-military partnerships for DSCA are important parts of GCC security cooperation efforts. The Office of U.S. Foreign Disaster Assistance (OFDA) is responsible for leading and coordinating the U.S. Government's response to disasters overseas.

- **Sea level rise and temperature changes** lead to greater chance of flooding in coastal communities and increase adverse impacts to navigation safety, damages to port facilities and cooperative security locations, and displaced populations. Sea level rise may require more frequent or larger-scale DoD involvement in HADR and DSCA. Measures will also likely be required to protect military installations, both in the United States and abroad, and to work with partner nations that support DoD operations and activities. Sea level rise, increased ocean acidification, and increased ocean warming pose threats to fish stocks, coral, mangroves, recreation and tourism, and the control of disease affecting the economies, and ultimately stability, of DoD's partner nations. Some Pacific island nations face the risk of being entirely submerged by rising seas, and most island nations' freshwater supplies will be threatened by saltwater intrusion well before then. Loss of land, especially highly populated and agriculturally rich coastal land, also poses second-order effects on human displacement and economic and food stability, and may further exacerbate challenges associated with disease vectors.⁴
- **Decreases in Arctic ice cover, type, and thickness** will lead to greater access for tourism, shipping, resource exploration and extraction, and military activities. Land access—which depends on frozen ground in the Arctic—will diminish as permafrost thaws. These factors may increase the need for search and rescue (SAR) capabilities, monitoring of increased shipping and other human activity, and the capability to respond to crises or contingencies in the region. Difficult and unpredictable weather conditions, large distances, and scarce resources make emergency response in the Arctic difficult. Arctic operations are expensive and dangerous for military forces that are unprepared for the austere operating environment. DoD continues to evaluate the need for specific Arctic capabilities.

³ Implementation of the International Strategy for Disaster Reduction, Report to Secretary General, UN General Assembly, A/69/364, September 2014.

⁴ South East Asia: The Impact of Climate Change to 2030. National Intelligence Council, January 2010.

Integration of Climate-Related Security Risks into Planning Processes

GCCs use their Theater Campaign Plans, Operation Plans, Contingency Plans, and Theater Security Cooperation Plans as a means to identify or take into account climate risks. To assist with historical climatology and climate change near-term assessments, the Air Force's 14th Weather Squadron (14WS) provides authoritative data sets and tailored decision aids to GCCs. In addition, the National Oceanic and Atmospheric Administration (NOAA) provides long-term global climate projections, weather forecasts, and other services to all federal agencies within the United States—including DoD.

Cooperation and building partner capacity. Although activities vary, all GCCs are working with partner nations to increase partner abilities to reduce risks and implications from environmental impacts and climate change, including severe weather and other hazards. GCCs work with partner nations in three lines of activities:

- *Building infrastructure:* examples include emergency operations centers, disaster response warehouses, disaster shelters, and construction of dams for hydro-electric power.
- *Training:* provides disaster management and response personnel in partner nations with the knowledge and skills to meet the basic needs of the populace. These programs are often coordinated with the in-country security cooperation officers and the U.S. Agency for International Development (USAID).
- *Equipping:* GCCs support the delivery of Non-governmental Organization (NGO) emergency donations through the Defense Security Cooperation Agency's Funded Transportation Program and Denton Program.⁵ U.S. Southern Command (USSOUTHCOM) funds National Preparedness Baseline Assessments, which include gap analyses and five-year plans to build capability and capacity within partner nations, helping to provide a better picture of specific vulnerabilities to climatic events across a wide range of indicators. Other GCCs have similar disaster risk reduction cooperation programs or are evaluating such programs.

Sharing best practices for mitigation of installation vulnerabilities. Military Departments are responsible for assessing and addressing the vulnerabilities of DoD installations. DoD has directed a global screening level vulnerability assessment to determine

⁵ The Denton Program provides transportation for approved humanitarian assistance commodities destined for approved countries. It is administered by USAID, the Department of State, and the Defense Security Cooperation Agency.

DoD installations' vulnerability to climate changes, water and environmental requirements, and sea level rise. The Military Departments will use information from the screening assessments to identify serious vulnerabilities and to develop adaptation strategies as necessary for installations.

Resources and Timeline

Resources for assessing and responding to the impacts of climate change are provided within existing DoD missions, funds, and capabilities. Activities associated with climate resiliency planning in GCCs are subsumed under existing risk management processes. Training for GCC personnel in accessing and using climate and weather data related to climate change may incur costs. Attending coordination meetings with partner nation organizations focusing on climate impacts may also add to GCC personnel responsibilities. In the future, other adaptation and resilience costs may become clearer and will need to be evaluated.

Humanitarian assistance and disaster relief is costly, particularly for first response activities. Common requirements include strategic lift assets, water and water purification capability, vertical lift assets for dispersal of relief supplies, engineering equipment for removing debris from critical infrastructure, medical care, robust communications, repair of overloaded or nonfunctioning electricity generation, SAR, and port opening and traffic control capabilities. DoD has put many of these capabilities in use for humanitarian assistance following the earthquakes in Nepal in 2015.

The main source of funding for the GCCs' HA/DR programs is the Overseas Humanitarian, Disaster, and Civic Aid (OHDACA) appropriation, which enables the Combatant Commands to provide immediate life-saving assistance to countries in their regions.

II. GCCs - Specific Aspects

Geographic Combatant Commands independently have assessed climatic risks in the context of their respective AORs. For instance, U.S. Africa Command (USAFRICOM) assesses humanitarian crisis as the most likely climate-related risk within its AOR, foremost due to the impact that devastating events like drought and disease could have on vulnerable populations and on state stability in places already struggling with fragility and conflict. North American Aerospace Defense Command / U.S. Northern Command (NORAD/USNORTHCOM) and USEUCOM are concerned with security risks arising from increased shipping, military operations, and resource exploration in the Arctic as the ice-cap melts. U.S. Pacific Command (USPACOM) considers rising sea-levels to be a particularly significant threat to people in geographically vulnerable locations. USSOUTHCOM similarly highlights the threat that sea

level rise and ocean acidification and warming pose to fish stocks, coral, mangroves, recreation and tourism, and the control of disease. USSOUTHCOM also identifies coastal flooding to be a particular concern for parts of the Caribbean basin due to climate change-related sea level rise.

GCCs assess that, in line with the Intergovernmental Panel on Climate Change (IPCC) conclusions,⁶ climate change will have the greatest impact on areas and environments already prone to instability, which aligns with DoD's wider assessment of climate change as a threat multiplier. USPACOM already reflects this likely implication in its planning processes by addressing not only the direct effects of climate change but also the imperative this implication creates for environmental and resource management. U.S. Central Command (USCENTCOM) similarly monitors resource scarcity (e.g., water, food, energy) in its arid AOR, and accounts for this factor in its planning. Although the context differs, USAFRICOM assesses that climate change will exacerbate existing economic, social, and environmental vulnerabilities, while conditions of drought, disease, and economic stagnation may tip states toward systemic breakdowns.

GCCs recognize the risk climate change poses to existing resource allocation. USAFRICOM highlights how climate change will alter the distribution and quality of natural resources, such as fresh water, arable land, coastal territory, and marine resources. USPACOM assesses that climate change will affect populations already living in unstable environments and already experiencing urban or rural conflict driven, in particular, by seasonal water shortage. USCENTCOM identifies that climate changes heighten competition at the national or sub-national level in an already arid region, and this competition could be more dangerous as actors seek to protect limited resources. However, inter-state conflict risk is attenuated by the context of international treaties and agreements. USNORTHCOM identifies increased resource exploration in the Arctic as driving an increase in the future demand for SAR and environmental disaster response missions in support of other agencies and civil authorities.

Both USSOUTHCOM and USAFRICOM recognize the economic risks associated with climate change, again as a stressor on vulnerable populations. USAFRICOM and USPACOM both identify how technological, infrastructure, skills, and information constraints heighten vulnerability to climate stresses.

GCCs highlight the impact that climate change may have on the frequency and severity of weather-related events. In addition to humanitarian assistance in its AOR, USPACOM

⁶ Intergovernmental Panel on Climate Change 2014, Impacts, Adaptation and Vulnerability, Summary for Policy Makers and Technical Summary, Working Group II to Fifth Assessment. <http://www.ipcc.ch/>

anticipates this will increase the demand for DSCA as well as pose a challenge to U.S. critical defense infrastructure. These concerns are consistent with the 2014 DoD Climate Adaptation Roadmap. GCCs are accordingly integrating climate-related risk mitigation into planning processes, the details of which are provided below:

USAFRICOM

Integration of Climate-Related Risks Management into Planning Processes

- USAFRICOM will consider climate change-related factors from key strategic documents⁷ in its annual Theater Campaign Plan (TCP) reviews.
- USAFRICOM's Foreign HA/DR Country Plans will be expanded to promote engagement with partner nations to enhance planning, responses, and resilience to the effects of climate change. USAFRICOM also works closely with USAID in HA/DR, and USAFRICOM's intervention in HA/DR operations will align with USAID's strategy.
- USAFRICOM's building partner capacity efforts are nested within its security cooperation programs and will adapt to a variety of trends and projections, including climate change.

Resources and Timeline

- USAFRICOM's resource planning takes into account the probabilities of climate events driving resource requirements for HA/DR-related program budgets. Embassy country teams throughout Africa work closely with interagency partners to ensure DoD contributions are represented in embassies' Integrated Country Strategy documents.

USCENTCOM

Integration of Climate-Related Risks Management into Planning Processes

- Current and historic climatic conditions are factored into TCPs, including water scarcity, which is a recurring issue in the AOR. Warning indicators are part of the deliberate planning process.
- Climate change is not a stand-alone topic. Real-world, actual climate conditions are taken into consideration for planning missions. HA/DR and security cooperation/building partner capacity are specific lines of effort addressed in the TCP.

⁷ Including the National Security Strategy, Quadrennial Defense Review, National Military Strategy, Joint Strategic Capabilities Plan, and the Chairman's Risk Assessment.

- Service components will address specific needs for their installations; for example, the Navy will address sea level rise and access to ports.

Resources and Timeline

- The Military Departments/Services provide most of the resources for on-the-ground activities. USCENTCOM focuses on nearer-term (five years) projected changes in climate.

USEUCOM

Integration of Climate-Related Risks Management into Planning Processes

- The Arctic Security Forces Roundtable is USEUCOM's flagship engagement effort for nations that have security forces within the Arctic region. It is a forum in which senior military leaders from Arctic nations, and other stakeholders, confer and agree upon actions that can support stability and peaceful commercial activity in the region. Lessons learned from our Arctic allies and partners are used to enhance operational safety. An Arctic assessment is included in the current TCP and informs the development of the GCC's activities.
- In response to melting ice and newly accessible areas of the Arctic, EUCOM sponsors the ARCTIC ZEPHYR series of table-top exercises focused on SAR operations in the Arctic.

Resources and Timeline

- The Northern Sea Route generally opens for four weeks each year—usually the month of September.⁸ Arctic-specific SAR resources will need to be trained and ready as Arctic activity, particularly tourism, increases. In 2016, the cruise liner CRYSTAL SERENITY will attempt to transit the North West Passage with 900 expected passengers, the first leisure cruise ship to make the crossing.
- Future Arctic offshore drilling will also create a resource demand and the need for emergency response, risk reduction measures, and environmental protections.

⁸ Canada's Northwest Passage will not likely be consistently open for another 20 years, with some estimates putting complete opening at 2050.

NORAD/USNORTHCOM

Integration of Climate-Related Risks Management into Planning Processes

- USNORTHCOM routinely includes extreme weather-driven scenarios in training and exercise events. USNORTHCOM has also developed planning tools to guide operational response efforts for potential catastrophic events, including severe weather events.
- NORAD/USNORTHCOM has participated in the ARCTIC ZEPHYR series of table-top exercises, and has conducted cooperative Arctic SAR exercises with Canada.
- NORAD/USNORTHCOM has hosted two Arctic collaborative workshops with the full range of governments, international partners, the private sector, and academia to focus on projected climate changes in the Arctic.

Resources and Timeline

- Acquisition and supply chain requirements for the Arctic are considerably longer than for the rest of the AOR and are much more costly. DoD will continue to partner with federal departments and agencies; state, local, and tribal agencies; other nations; and the private sector on services as appropriate.

USPACOM

Integration of Climate-Related Risks Management into Planning Processes

- USPACOM efforts addressing climate change risks are primarily outlined in the “All Hazards” Line of Effort in the USPACOM TCP. The focus is two-fold: readiness to respond to and be resilient to disasters, and sustainable resource management toward critical resource security. USPACOM coordinates these efforts with a variety of DoD interagency partners—including the Department of State, USAID, Department of Homeland Security, Department of the Interior, and NOAA—to ensure its readiness to execute concepts of operations for DSCA, Pandemic and Emerging Infectious Disease, and Foreign HA/DR.
- USPACOM Country Security Cooperation plans, under the Theater Security Cooperation Plan and its logistics Theater Security Cooperation branch, provide opportunities to work in collaboration with host nations to address disaster and critical resource security needs through a variety of operations, actions, and activities in country.
- USPACOM is developing a visual display tool that seeks to overlay historic disaster event data, climate and weather data, population and geographic data, Country Book information, resource scarcity data, and all hazards-related activities in the region into a comprehensive tool that will not only provide planners with historic and needs-based data to inform plans,

but will also enable USPACOM and those with access to the information to leverage and co-execute events for the greatest overall impact in the region. USPACOM is working to integrate Australia, Canada, New Zealand, and the United Kingdom into all hazards-related activities to leverage lessons learned, best practices, and limited resources to support disaster response readiness and capability development more effectively, as well as work toward critical resource security as a means of protecting peace in the region.

- In June 2015, USPACOM and Thailand co-hosted the fifth annual Pacific Environmental Security Forum in Bangkok. The forum seeks to develop foreign nation capacity in several environmental security areas through combined projects within the USPACOM AOR. Sessions on project concept development followed three days of discussions on the DoD Climate Change Adaptation Roadmap, the protection of the commons in a civilian-military context, and military environmental programs.
- USPACOM is also developing partnerships focused on building the overall resilience of the State of Hawaii and nesting the resilience of USPACOM installations within that framework.

Resources and Timeline

- USPACOM has established Pacific Augmentation Teams around its AOR to identify quickly immediate needs that can be met with military assets. These teams represent an effort to shorten disaster response times by allowing USPACOM to begin mobilizing a response in anticipation of a Secretary of Defense-approved request. Proximity to the disaster is also a factor that dramatically reduces the response time. U.S. forces training, exercising, or operating in the vicinity of a disaster can be re-tasked to support relief efforts.

USSOUTHCOM

Integration of Climate-Related Risks Management into Planning Processes

Humanitarian Assistance and Disaster Relief

- Although the USSOUTHCOM HA/DR program does not explicitly incorporate climate change planning, it maintains communication with the disaster response actors and first responders at the relevant agencies of USSOUTHCOM partner nations.
- USSOUTHCOM assists partner nations in making sure that they have the infrastructure, training, and equipment necessary to respond to any disaster, and also assists them with the preparation of their disaster response plans. In this way, USSOUTHCOM fulfills one of its military end states: “Partner nations have the capability and capacity to conduct HA/DR operations to mitigate the effects of natural and man-made disasters.”

- USSOUTHCOM is not the lead entity when it comes to support of a partner nation response to a disaster; it supports OFDA.
- As an example of a weather-related disaster preparation, although not necessarily climate change planning per se, for the last three years (after the Haiti earthquake in 2010) USSOUTHCOM has requested authorities to use OHDACA funding to preposition assets under its operational control when a severe storm threatens Haiti, in order to be able to respond immediately to a potential disaster response requirement.
- The National Preparedness Baseline Assessments, funded by USSOUTHCOM, include a gap analysis as well as a five-year plan to build capability and capacity within the countries in the region. They include data collected at a national and sub-national scale utilizing both current and historical information, combined with environmental, social, policy, and economic indicators. This analysis can provide a better picture of specific vulnerabilities to climatic disasters across a wide range of environmental, social, and economic indicators. The collection of sub-regional data will provide a more nuanced depiction of each country's risks and vulnerabilities to disasters that may be influenced by climate change as well as their readiness to respond to them.

Security Cooperation / Building Partner Capacity: USSOUTHCOM has conducted some security cooperation activities related to military adaptation to climate change. These activities have been nested under its HA/DR and critical access lines of effort. Several partners in the region have expressed interest in discussing and taking steps to address environmental and energy challenges for military forces, including climate change. As an example, in 2014 USSOUTHCOM completed a collaborative report on this topic with military experts from Chile, Colombia, El Salvador, and Trinidad & Tobago, and presented the outcomes to the Inter-American Defense Board.

Resources and Timeline

- USSOUTHCOM has identified the additional resources required to “Identify and assess the effects of climate change on the Department,” which is the first goal in the DoD 2014 Climate Change Adaptation Roadmap. USSOUTHCOM will also seek appropriate resources to fund assessments to determine the effects of its most serious and likely climate-related risks.

III. Conclusion

The Department of Defense sees climate change as a present security threat, not strictly a long-term risk. We are already observing the impacts of climate change in shocks and stressors to vulnerable nations and communities, including in the United States, and in the Arctic, Middle East, Africa, Asia, and South America. Case studies have demonstrated measurable impacts on areas vulnerable to the impacts of climate change and in specific cases significant interaction between conflict dynamics and sensitivity to climate changes. Although climate-related stress will disproportionately affect fragile and conflict-affected states, even resilient, well-developed countries are subject to the effects of climate change in significant and consequential ways.

For these reasons, Combatant Commands are integrating climate-related impacts into their planning cycles. Depending on the region, risks to Combatant Commands vary, but all GCCs share a common assessment of its significance. The ability of the United States and other countries to cope with the risks and implications of climate change requires monitoring, analysis, and integration of those risks into existing overall risk management measures, as appropriate for each Combatant Command.

Although DoD and the Combatant Commands cannot prepare for every risk and situation, the Department is beginning to include the implications of a changing climate in its frameworks for managing operational and strategic risks prudently. Moreover, the Department is working with other U.S. Government departments and agencies, partner nations, and many other entities on addressing climate security risks and implications.