

# MILITARY EXPERT PANEL REPORT

## SEA LEVEL RISE AND THE U.S. MILITARY'S MISSION

September 2016



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# I NOTE FROM THE MILITARY EXPERT PANEL

As military professionals who have spent our adult lives serving the United States, we are concerned about the impact sea level rise is having, and will have, on the ability of our military infrastructure to sustain our nation's operating forces and fulfill strategic objectives. It is clear we must do more to address these risks, and do it soon.

There are a growing number of studies exploring the actual and potential physical impacts of sea level rise on U.S. military installations, and these studies show that the risks are increasing at a faster rate than expected.<sup>1</sup> However, important questions remain only partially answered: How will a changing climate impact our military basing, training, readiness and ability to control and conduct military operations? What are the broader implications for the military's ability to fulfill its mission due to anticipated increases in operations tempo? This report begins to answer those questions and offers a path forward to policy-makers for addressing those risks.

One thing is clear. We cannot wait for perfect information before assessing the risks and impacts, and responding in a way that is commensurate to those risks. The military has long had a tradition of parsing threats through a "Survive to Operate" lens, meaning we cannot assume the best case scenario, but must prepare to be able to effectively operate even under attack. Dealing with climate risks to operational effectiveness must therefore be a core priority.

To get ahead of the risks, this report looks out in time to assess the effects of sea level rise happening simultaneously across a broad range of military infrastructure domestically and globally, and the resulting cascading effects on the ability to train, mobilize, operate and fulfill strategic objectives. The continued strength of the U.S. depends, in large part, on having a clear-eyed assessment of risks and threats to the nation, and addressing them well before they manifest themselves. This report is an attempt to present a clearer picture of sea level rise risks, what that means for our nation's armed forces, what that means for national security, and what we can do about it. In doing so, we hope to modestly contribute to the effectiveness of our nation's military and to help ensure a strong and resilient United States.

Signed,

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<sup>1</sup> See for example Curt D. Storlazzi, Edwin P.L. Elias & Paul Berkowitz, 'Many Atolls May Be Uninhabitable Within Decades Due to Climate Change', Scientific Reports 5, Article number: 14546 (2015) doi:10.1038/srep14546, part of the US Geological Survey's research project 'The Impact of Sea-Level Rise and Climate Change on Pacific Ocean Atolls that House Department of Defense Installations', <http://walrus.wr.usgs.gov/climate-change/atolls/> - accessed August 2016.

## II EXECUTIVE SUMMARY

The United States military is the greatest globally-deployed military force in human history. That military force is present in 156 nations, and ready to advance U.S. interests, whether that be on a war-fighting or humanitarian mission. To do so, the U.S. military depends on essential services and infrastructure, both built and natural, to support a trained and ready force.

This capability, however, rests on an assumption of climate stability - including the stability of the 95,471 miles of coastline along which 1,774 U.S. military sites reside across the globe.<sup>1</sup> In the 21st century, the stability of that climate, and the stability of those coastlines from which the military launches its operations, is set to change dramatically due to sea level rise and storm surge. For example, major transportation, command and control, intelligence, and deployment hubs may face unrelenting erratic outages, or curtailment of operations in the future, due to sea level rise and storm surge. In that context, the ability of the Department of Defense (DoD) to fulfill mission requirements will be more costly, take more time, and be hindered by a lack of planned-for assets at critical junctures. As these threats to coastal military infrastructure play out over this century, they may become strategic vulnerabilities that could affect our ability to deter our enemies, defend our interests, and support our friends. In other words, “at a time and a place of our choosing” may not be our choice in the future.

Essentially, the very geostrategic landscape in which the U.S. military operates is going to be different from what it is today. Since the U.S. military’s numerous military installations live in that changing landscape, it will have to adapt, and adapt quickly. To use military parlance, the theater is, in essence, flooding. Adjusting to that rapidly changing theater will be absolutely critical for the U.S. military to maintain its ability to fulfill its mission, and for the United States to adequately pursue its national security interests. At the center of this adjustment are coastal military installations - their infrastructure and the adjacent supporting communities - that form the backbone of this global military force.

This report is not an exhaustive look at all of the climate risks and vulnerabilities coastal military installations are facing. However, it synthesizes studies by the Department of Defense (DoD), Congress and independent researchers, explores a range of case studies, analyzes what those findings mean for military readiness, operations and strategy, and lays out areas that deserve more attention.

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<sup>1</sup> Hall, J.A., S. Gill, J. Obeysekera, W. Sweet, K. Knuuti, and J. Marburger. 2016. Regional Sea Level Scenarios for Coastal Risk Management: Managing the Uncertainty of Future Sea Level Change and Extreme Water Levels for Department of Defense Coastal Sites Worldwide. U.S. Department of Defense, Strategic Environmental Research and Development Program. 224 pp. <https://www.serdp-estcp.org/News-and-Events/News-Announcements/Program-News/DoD-Report-on-Regional-Sea-Level-Scenarios>

# III FINDINGS AND LIST OF RECOMMENDATIONS

This report finds that over the course of the remainder of the 21st century, the U.S. military's coastal military installations, domestically and internationally, face significant risks from climate-driven trends, namely sea level rise and the interaction of sea level rise with an increased frequency and intensity of extreme weather events. This report also finds that these risks, if not sufficiently mitigated, may eventually have wide-ranging effects on the military's ability to effectively fulfill its mission. This includes effects on military readiness, military operations and military and national security strategy. This report also concludes that policies and plans for addressing these risks will have to be commensurate to a scale of risk that goes beyond infrastructure resilience. Indeed, climate change effects such as sea level rise are not just an installation and facility issue for U.S. military forces. They also present operational and strategic risks, and these broader implications must be both better understood, planned for and prevented. The complex relationship between sea level rise, storm surge and global readiness and responsiveness must be explored down to the operational level, across the Services and Joint forces, and up to a strategic level as well. Given that these conclusions are widely shared by the DoD, the report authors recommend that policy-makers support comprehensive and preventive measures, in the near term, to address these risks.

In this context, we offer eight specific recommendations for the near-term aimed at addressing sea level rise risks to the U.S. military's mission.

1. Continuously identify and build capacity to address infrastructural, operational and strategic risks.
2. Integrate climate impact scenarios and projections into regular planning cycles.
3. Make climate-related decisions only after considering the highest risk level projections.
4. Game out catastrophic scenarios in planning.
5. Work with international counterparts at key coastal bases abroad.
6. Track trends in climate impacts as uncertainty levels are reduced.
7. Maintain close collaboration with adjacent civilian communities.
8. Continue to invest in improvements in climate data.

To read the full report, please visit [www.climateandsecurity.org/reports](http://www.climateandsecurity.org/reports)