

# Military Basing and Climate Change

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Climate change not only affects our security through its impacts on the economy and our physical infrastructure (roads, bridges, airports, etc.); it also can also affect domestic and international military bases as flooding, drought and extreme weather events intensify.

Physical changes to the environment may disrupt U.S. military capabilities and facilities, such as military training ranges or bases.<sup>1</sup>

According to the U.S. Department of Defense (DoD) 2010 Quadrennial Defense Review, there are a number of US military installations that are already at risk.

The report says:

*“In 2008, the National Intelligence Council [NIC] judged that more than 30 U.S. military installations were already facing elevated levels of risk from rising sea levels. DoD’s operational readiness hinges on continued access to land, air, and sea training and test space.”<sup>2</sup>*

Although sea-level rise is a major concern, other environmental threats must be taken into consideration in order to keep our military installments safe and secure. We tend to look at environmental threats on an individual, case-by-case basis, which does not take the plethora of threats into account.

According to Cleo Paskal, *“The NIC’s 2008 focus was primarily sea level rise. However, considering flooding threats alone, coastal sites may be affected by sea level rise, but also subsidence, river flooding, unusually heavy rainfall, and dam bursts.”<sup>3</sup>*

In order to prepare our military installments for the effects of climate change, we must not make a one-dimensional risk assessment but instead, prepare for multiple types of environmental threats such as flooding from extreme weather, droughts and civil unrest related to food and water insecurity.



According to the U.S. Department of Defense 2012 Base Structure Report, the United States military manages property in all 50 states, 7 U.S. territories and 40 foreign countries, comprising almost 300,000 individual buildings around the globe.<sup>4</sup> These buildings are valued at **\$590 billion**.

The Army alone has over 14 million acres of property, 2000 installations and 12,000 historical structures.<sup>5</sup> As the effects of climate change increase in many parts of the world, our investments and structures may be at risk of severe damage.

Environmental threats to domestic U.S. military bases pose as much of a physical threat as they do an economic threat.

In 1992, Hurricane Andrew nearly wiped out Homestead Air Force Base in Florida and Hurricane Katrina destroyed 95% of Keesler Air Force Base in Mississippi. Both of these bases were rebuilt, but it took millions of dollars to do so. Military bases in the U.S. are important for driving local economies and when they are destroyed by natural disasters, there is a ripple effect economically in the region.

Environmental threats to international U.S. military installments have more strategic implications.



*Damage to Homestead Air Force Base after Hurricane Andrew*

For example, the island of Diego Garcia in the Indian Ocean is a critical logistics hub for US and British forces in the Middle East.

It also houses Air Force Satellite Control Network equipment that is used to control the GPS constellation.<sup>6</sup> The island is extremely vulnerable to the effects of climate change because it is just one meter above sea-level. If the island is flooded or inundated completely, the US will lose a strategically vital installation in the most tumultuous region in the world.

Climate change poses costly threats to our domestic installations and potentially destabilizing threats to our international installations that hold strategic importance to the U.S. military.

In order to prepare for these changes and to secure our military investments worldwide, the U.S. must invest in low-cost adaptation options, which are effective and multidimensional.

The Department of Defense must make it a priority to understand the effects of climate change on both its operations and fixed installations as changes to environmental resources and man-made infrastructure intensify.

In order to understand these effects, the Department of Defense must complete a comprehensive assessment of the potential impacts of climate change on its installations and missions globally.

Top 5 Most Vulnerable Military Installations (listed in no specific order)

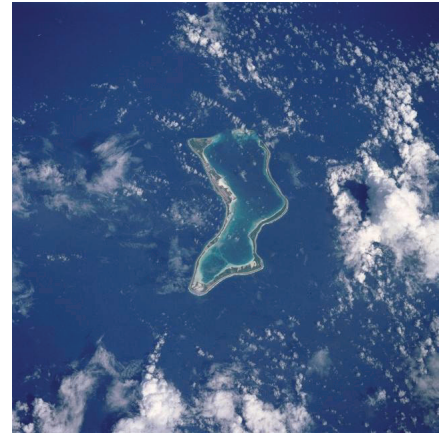
The following bases are strategically important for the US and are also extremely vulnerable to extreme weather, rising sea-levels, coastal erosion and other effects of climate change.

### **1. Diego Garcia**

Diego Garcia is a critical logistics hub for the US and UK militaries in the Middle East. However, the island is a coral atoll encompassing 67 square miles, of which only 10 square miles is dry land.<sup>7</sup>

Due to its exposure to the extreme weather in the Indian Ocean, changing temperatures and increasing rainfall, Diego Garcia faces the threat of coastal erosion and flooding. The highest point above sea-level is 22 feet, but the island's mean height above sea-level is 4 feet.

Most areas do not exceed 6.5 feet (2 meters). A sea-level rise of a several feet would force the US military to undertake a costly and difficult military relocation process; in addition, the military would lose a geographically strategic outpost in the Indian region.



*Diego Garcia, as seen from space*

SOURCE: NASA

## 2. Bahrain

Military installations out of Bahrain, including U.S. “floating bases”- The U.S. military has built up military reinforcements into the Persian Gulf, many based out of Bahrain, to deter Iranian military from any possible attempt to shut the Strait of Hormuz (a key oil shipping route for the U.S.).

The most visible presence are U.S. “floating bases,” including the USS Ponce, which are used to support missions in areas where ground base action is not available.<sup>8</sup> Since Bahrain is an archipelago with many coastlines, sea-level rise and extreme weather are pressing issues for the country and for our military installations in the region.

## 3. Guam

The military installation on the island of Guam is one of the most strategically important US bases in the Western Pacific Ocean. Military presence on Guam allows the US access to China and the rest of East Asia by air and sea to the West and Hawaii and North America to the East.<sup>9</sup> It has a protected harbor and sufficient land for airports and military installations. It is also the largest of the Mariana Islands, an archipelago in Micronesia.

Because Guam is exposed in the open ocean, it is susceptible to extreme storms, sea-level rise and erosion. If the ocean rises significantly, U.S. strategic interests on the island of Guam will be at risk.

## 4. Eglin Air Force Base, FL

Located on the Gulf of Mexico, Eglin Air Force Base is the largest Air Force base in the world. It encompasses 724 square miles of land and occupies the majority of the northwest Florida panhandle. It serves as the focal point for all Air Force armaments and is home to the Air Force Armament Center (AAC), one of three product centers in the Air Force Materiel Command.

The AAC develops, tests and deploys many critical air-delivered weapons.<sup>10</sup> It is a very important base not only for the US military but also for the local Florida economy. Since it is located on the coast in the Gulf of Mexico, it faces storm surges, sea-level rise and saltwater infiltration, which causes problems with freshwater resources in the area.

With the increase of extreme weather, Eglin Air Force Base may face costly damages in the future.

## 5. Norfolk Naval Air Station Norfolk, VA

Naval Base Norfolk is one of the largest naval complexes in the world, situated on the southern coast of Virginia in an area commonly known as Hampton Roads.

The Naval Station houses US Atlantic Fleet, Commander Navy Region Mid-Atlantic and the Navy’s largest

supply center. The nearby Newport News shipyard is also the only yard in the U.S. that builds aircraft carriers.<sup>11</sup> Because of its location on the southern tip of Virginia, it is at risk of sea-level rise and storm surge, but it may also face threats from hurricanes in the Atlantic.

As the effects of climate change become more pronounced, Norfolk Naval Air Station may be effected more acutely, putting strategic naval resources at risk.

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## Read more on the national security implications of climate change in the [Climate Security Report](#)

### Endnotes

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## Building a New American Arsenal

The American Security Project (ASP) is a nonpartisan initiative to educate the American public about the changing nature of national security in the 21st century.

Gone are the days when a nation's strength could be measured by bombers and battleships. Security in this new era requires a New American Arsenal harnessing all of America's strengths: the force of our diplomacy; the might of our military; the vigor of our economy; and the power of our ideals.

We believe that America must lead other nations in the pursuit of our common goals and shared security. We must confront international challenges with all the tools at our disposal. We must address emerging problems before they become security crises. And to do this, we must forge a new bipartisan consensus at home.

ASP brings together prominent American leaders, current and former members of Congress, retired military officers, and former government officials. Staff direct research on a broad range of issues and engages and empowers the American public by taking its findings directly to them.

We live in a time when the threats to our security are as complex and diverse as terrorism, the spread of weapons of mass destruction, climate change, failed and failing states, disease, and pandemics. The same-old solutions and partisan bickering won't do. America needs an honest dialogue about security that is as robust as it is realistic.

ASP exists to promote that dialogue, to forge consensus, and to spur constructive action so that America meets the challenges to its security while seizing the opportunities the new century offers.



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