
Global Climate Change and National Security

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Depending on the audience, global climate change has many different meanings. For environmentalists, global climate change may be the number one threat facing the world. Many argue that humans are the sole cause of the problem and that it is incumbent on us to take steps to reverse course. Some in that community go so far as to see mitigating global climate change as a chance to reverse the course of modernity. For many business leaders, doing so presents a serious challenge to some traditional industries, threatening the basic building blocks, such as petroleum and coal, upon which Western nations have built their economies. They argue that science has yet to determine the exact causes of climate change, and it is premature to disrupt the economy to address a threat that man may not cause. However, others in the business community view climate change as a tremendous opportunity to develop and sell cutting-edge technologies to reduce the impact of man-made greenhouse gases.

For the military, global climate change represents considerable uncertainty and risk. See CNA, NATIONAL SECURITY AND THE THREAT OF CLIMATE CHANGE (2007), prepared under direction of an Advisory Board comprised of three-star and four-star Flag Officers from the Army, Navy, Air Force and Marine Corps, www.SecurityAndClimate.cna.org. There are numerous reports detailing the potential causes of global climate change, including the November 18, 2007, *4th Assessment Report of the Intergovernmental Panel on Climate Change*, which reports that “the warming of the climate system is unequivocal.” www.IPCC.ch. For the military, whether the warming is caused by man, is naturally occurring, or is some combination of the two is immaterial. The military cannot wait for the science to be perfected to begin planning for the potential effects of global climate change. Likewise, the military cannot morally judge the causes of global climate change. What matters is that it is occurring and the results will have impacts on military operations.

Instead of focusing on the causes of climate change, or even how to prevent it, the military must plan for the risks posed by global climate change. Risk is defined as the chances that an event will occur multiplied by the magnitude of its occurrence. Viewed through that lens, the effects and poten-

tial outcomes of global climate change—whether it is man-made or naturally occurring—are disastrous.

In terms of risk and military strategy, the disastrous effects of global climate change can best be described as a low probability/high consequence event. The low probability is due to science still being unsettled about the actual magnitude and timing of the potential impacts of global climate change and the chances of halting or reversing its causes. Perhaps the apocalyptic scenarios envisioned by some will never come to fruition. However, the potential high consequences of a worst-case scenario, such as droughts, famines, and floods, are disastrous, so the U.S. military has no choice but to consider the effects of global climate change.

The United States military has long planned its strategy around low probability/high consequence events. Much of the Cold War strategy involved the threat of a Soviet nuclear attack, which is the very model of such an event. Although it never happened, the military would have been derelict not to have planned for such an event. Following September 11, the military focused on many other low probability/high consequence threats, including bioterrorism and chemical warfare. That such events had happened only infrequently in the past and had only minimal probability of occurring in the future did not justify ignoring the risk or failing to plan for it. Indeed, the very severity of the potential consequences required the military to prepare. The same is true with global climate change for which the exact magnitude and location of its effects are highly uncertain.

Stability is the heart of our national security policy. Our Cold War strategy centered on maintaining the balance of power with the Soviet Union. The United States sought alliances that maintained stability, even when such actions may have been counter to other compelling interests or may have produced long-term negative consequences. Other such examples abound, including our aid to Iraq during the Iran-Iraq war, aid to the mujahideen in Afghanistan, and support for undemocratic regimes in Southeast Asia and Latin America. Although there may have been downsides to these actions, in the strategic picture, maintenance of a bipolar balance of power and the stability it produced was paramount.

The loss of stability is the primary threat of global climate change. Climate change does not create new enemies for the United States or empower our existing foes. It is not a weapon that enemies can harness directly. Instead, climate change is an engine of destabilization, resulting in long-term shifts in weather, precipitation, sea level, food supplies, and

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population. Our enemies, both current and future, may exploit these shifts for their own gain. Climate change is a threat multiplier. The range of troubling national security risks were recently summarized by General Gordon R. Sullivan, USA (Ret.) in his September 27, 2007, testimony before the U.S. House of Representatives Subcommittee on Investigations and Oversight, Committee on Science and Technology. See <http://securityandclimate.cna.org/testimony/transcripts/070927.aspx>.

Three overarching policy documents guide current U.S. military strategy. At the top, the National Security Strategy (NSS) is an executive-level document, promulgated by the president, which sets the overarching international security priorities of the country. Second is the National Defense Strategy, which is produced by the secretary of defense. It translates the president's guidance in the NSS to mission-specific priorities in the U.S. Department of Defense. The chairman of Joint Chiefs of Staff (CJCS) promulgates the third document, the National Military Strategy, which "provides focus for military activities by defining a set of interrelated military objectives from which the Service Chiefs and combatant commanders identify desired capabilities and against which CJCS assesses risk." These documents are updated periodically to reflect changing priorities and world conditions. Interestingly, none of the existing versions of these documents identifies global climate change as a risk for which the United States must prepare its military. Of the three, only the NSS even mentions climate change, solely in the context of balancing economic growth with the reduction of greenhouse gases.

As part of its status as the world's only superpower, the United States military is the only force today that has the ability to project power anywhere on the globe for a nearly unlimited duration. That ability is a great benefit to U.S. political leaders. However, it also means that the military must plan for the full effects of climate change. U.S. forces operate throughout the world, in all climates. For example, naval and air forces routinely operate in the frigid Polar Regions, especially the Arctic. Land forces operate in all conditions: from the deserts of Southwest Asia, to the jungles of South America and Pacific, to the temperate regions of Europe. These forces must be prepared to fight in all climates.

Moreover, U.S. forces engage in many types of operations throughout the world that have nothing to do with combat. Although in its most simple terms, the job of the U.S. military is, in the words of the Army, "to fight and win America's wars," that is an oversimplification. The U.S. military engages in far more "operations other than war" (OOTW) than in actual battles. A short list of OOTW includes counterterrorism, disaster relief, humanitarian assistance, security assistance, peacekeeping operations, and support to U.S. civilian authorities. Real-world examples of these types of activities include peacekeeping operations in Bosnia, disaster relief in Indonesia following the December 2004 tsunami, and security assistance and counternarcotics assistance in Latin America. The pace of these types of operations is likely to increase as the pace of global climate

change hastens change.

The potential consequences of global climate change on U.S. security interests are varied and will affect the full range of U.S. military operations. Climate change is predicted to thin and reduce the ice caps in the polar region, exposing new areas to competition for scant resources. The United States Navy and Coast Guard will be called upon to support and defend national interests in these areas. Changes in precipitation patterns may have long-term consequences on access to drinking water, drought, and food production. In response to these events, there may be mass migrations of people both within and across national borders. In such instances, Army Civil Affairs Teams may be dispatched to provide infrastructure and response, and United States Air Force aircraft may be called on to provide airlift to the disaster relief and humanitarian assistance missions. These stressors may further weaken already faltering governments, which in turn may provide safe haven to terrorist organizations. United States Special Forces may engage in security assistance in these countries. Likely, every branch and specialty of the military will be called upon to deal with the consequences of global climate change.

The Effects of Global Climate Change on National Security

To begin the planning for global climate change, the military must first understand the potential effects to which it may be required to adapt. Some of the effects are direct, such as changes in precipitation that restrict access to potable water. Others are indirect, such as the mass movement of populations in response to drought induced by climate change. Ultimately, the most serious effects these occurrences may have on national security will be the effect on already weakened and failing governments.

Perhaps the immediate potential consequence of global climate change will be the impact resulting from changes in precipitation. Adequate quantities of freshwater for irrigation, drinking, and sanitation are essential to human existence. Changes in the amounts or patterns of precipitation, especially droughts, can produce disastrous results. The potential loss of drinking water may occur from both drought conditions and the reduction of mountain glaciers. According to the International Water Management Institute (IWMI), many countries in the world's most troubled regions, such as North Africa and the Middle East, already are considered "water scarce." These countries soon will be joined by Pakistan, South Africa, and large parts of India and China. Indeed, by 2025, the IWMI estimates that 1.8 billion people will live in countries or regions with absolute water scarcity, due to both increases in population and decreased water supply. The Intergovernmental Panel on Climate Change notes that although total precipitation amounts may not change much because of global climate change, the variability in precipitation patterns likely will result in more frequent droughts in water-scarce countries.

The loss of mountain glaciers will exacerbate the problem of reduced access to potable water. Glaciers provide water for

up to half of the world's population, including much of Asia. In his book *Outgrowing the Earth: The Food Security Challenge in an Age of Falling Water Tables and Rising Temperatures* (W. W. Norton & Company 2004), Lester Brown estimates that a rise of 2–4° Fahrenheit (F) in mountainous regions can have major impacts on the size of mountain glaciers by changing the mix of snowfall to rainfall. The result is more flooding during the rainy season (think storm water runoff in the United States) and less snowmelt to sustain base flows during drier seasons.

On the other side of the equation, there are potential security implications of too much precipitation. As this article is being written, England is experiencing floods such as it has not seen in years. The devastating effects of Hurricane Katrina are still fresh in the minds of local, state, and federal governments. These events stretched the capabilities of even the most developed countries to respond. The potential for larger storm events caused by climate change would easily overwhelm the capability of many third-world governments to respond.

Related to precipitation changes is the effect of drought on food production. Perhaps the best example of this is occurring today in Africa. The continent has experienced major droughts during the last thirty years. The severe droughts of the 1980s in Ethiopia and the associated pictures of starving women and children have been replaced most recently by those in Darfur. In each case, long-term drought had a severe impact on food production, affecting crops in Ethiopia and grazing lands in Darfur. Climate change will continue to exacerbate these types of problems. Scientists estimate that for every 1.8°F rise in temperature, grain production in these regions will be reduced by 10 percent.

These changes in precipitation patterns, availability of potable water, and food production may have indirect impacts on security, mainly taking the form of mass migrations due to both resource scarcity and the resulting political instability. There are three main types of migration, and each has its attendant problems. Internal migration—migration within a country's borders—may cause short-term economic and political consequences. These consequences may be quite severe, such as the estimated 4.5 million people displaced in Ethiopia, or relatively benign, such as the diaspora that resulted from Hurricane Katrina. However, if even a developed nation struggles to accommodate the estimated 300,000 people displaced by Katrina, the prospects are far worse for developing nations.

Cross-border migration, migration that crosses international borders, can fuel ethnic tensions in receiving nations and possibly lead to international conflict. Although there are many causes of cross-border migration, such as the difference in economic opportunities between Mexico and the United States, environmental factors may cause mass migrations over relatively short time periods; the sudden influx of people may overwhelm host nations.

The final type of migration is international migration that crosses regions. The best example is the flow of immigrants from Asia and Africa to Europe. Although not as dramatic as cross-border migration, this type of migration may cause long-

term impacts on the receiving region. For example, the influx of people from Islamic countries has, in part, increased religious tensions in Western Europe and resulted in incidents such as the 2005 riots in France.

Although a number of factors influence the patterns of migration, there is little doubt that global climate change will hasten and increase migration and add new stressors to already tense situations. Without an adequate response from governments, especially to mass migrations in response to catastrophic weather events, the resulting chaos may have serious ramifications to national security.

Another probable outcome of global climate change is the melting of polar ice caps and attendant sea level rise. For all of modern history, ice caps have covered the Polar Regions. Even a small rise in temperature could cause massive melting of this ice. The result will have both direct and indirect impacts on the military. The melting of the ice caps could introduce massive quantities of freshwater into the world's oceans. The sea level rise that might accompany this could have disastrous results on low-lying communities. The United States Geological Service estimates that nearly one-quarter of the world's population lives within 100 feet above sea level. Sea level rise has the potential to displace these people and contribute to mass migration. Moreover, as a direct result of the shrinking of the polar ice caps, areas that were previously inaccessible will become more open to human development. Disputes may arise over the control of these areas.

Regional Effects of Global Climate Change

No region on earth will be immune from the challenges caused by global climate change. The potential disruptions of weather patterns, ocean currents, glacial melting, and temperature will have impacts across the globe. Although some changes may be positive, such as increased food production in some marginal areas, overall, the changes will present significant challenges to the United States military. Two regions where this is especially true are Africa and the Arctic.

Throughout most of our history, the United States has not focused much attention on Africa. The prevailing view was that the region was plagued by intractable poverty, instability, and inept government and therefore was not a national security concern. To the extent that view may have been accurate, at least in some areas of Africa, the effects of global climate change will only exacerbate those conditions. Changes in weather will affect the production of food and supply of freshwater, creating more poverty, which leads to new sources and areas of instability. Already strained tribal and cultural differences will be further stressed, leading to future humanitarian crises. These have the capacity to lead to future failed states, which breed the conditions necessary for the spreading of violent ideologies and associated terrorist training.

Africa is distinct from other regions in the nature and variety of its challenges. For example, the climate across Africa varies considerably. In the north are the arid regions of the Sahara. Sub-Saharan Africa is a mix of impenetrable jungles and open savannas. South Africa presents a more temperate cli-

mate. Overlaid on this geography are religious tensions, racial strife, ethnic conflicts, and tribal violence.

The principal concerns for U.S. security interests in Africa are the use of failing and failed states for terrorist training and U.S. access to petroleum and strategic mineral resources upon which the U.S. and the global economy depend. Global climate change may put those African countries essential to U.S. strategic objectives and regional stability at risk by causing water and food scarcity and the potential for mass migration and ensuing ethnic conflicts.

Recognizing that Africa is not a distant region it can ignore, in 2007, the United States established U.S. Africa Command (AFRICOM). The Department of Defense generally divides responsibility and resources on geographic lines. Until the creation of AFRICOM, military responsibility for Africa was divided between three commands: European Command, Central Command, and Pacific Command. None made Africa a priority; instead, each focused on more pressing problems in its area of responsibility. As a result, incidents in Africa did not receive the attention or resources necessary to produce positive change. The purpose of AFRICOM is to change that dynamic and enable the Department of Defense and other elements of the U.S. government to work in concert with regional partners to achieve a more stable environment in which political and economic growth can take place. U.S. Africa Command will consolidate the efforts of three commands into one focused solely on Africa and help coordinate U.S. government contributions on the continent. Creating an independent command gives the region the focus and attention that it deserves as an increasingly important area for U.S. national and economic security.

The effects of climate change have the potential to severely challenge AFRICOM's ability to respond. In some places, the Sahara desert is already spreading southward from North Africa at a rate of 5–6 kilometers per year. Many climatologists expect sub-Saharan Africa to have decreased precipitation that may result in the arid area in Africa increasing by nearly 10 percent by 2080. These changes have the potential to increase drought and famine throughout the continent. In turn, as people search for diminishing supplies of potable water and arable land, regional and cross-border migration may exacerbate long-standing racial, ethnic, and religious tensions.

The potential for sea level rise also may cause considerable problems in Africa. Nearly twenty-five percent of Africa's population lives along the coast. In Nigeria alone, approximately 20 million people on the Niger Delta live at or just above sea level. This region is especially critical to U.S. security as nearly three percent of the world's known oil reserves are in Nigeria. It is also home to a long-standing civil war fueled by ethnic and religious tensions.

AFRICOM needs to start planning for these problems. Even before the creation of this combatant command and newfound focus on the continent, the United States has sent Civil Affairs teams to the region. These teams have the capacity to support limited projects to enhance infrastructure. Unlike other military commands, once AFRICOM is fully operational, it will be staffed by a large number of personnel

from the Department of State and the Agency for International Development. This mix of personnel should allow the command to leverage those civil tasks that the military excels at—transporting cargo, establishing and maintaining communications systems, planning and executing large-scale operations—with those activities better performed by other state and nonstate actors. In the not too distant future, it may be conceivable that AFRICOM will be the clearinghouse for a variety of activities that have the ability to ameliorate the effects of global climate change.

Likely, every branch and specialty of the military will be called upon to deal with the consequences of global climate change.

The Arctic region presents a fascinating study of how global climate change already is affecting national security. For untold centuries, the Arctic ice cap has prevented that region from becoming a battleground. During the height of the Cold War, the skies above were monitored for ballistic missile and strategic bomber attacks, but the seas and lands below went untouched. However, with the end of the Cold War, many nations lost interest in the region. Canada disbanded the remainder of an already meager naval force in the region, the United States deleted future icebreaker procurement, and the Russians lost interest.

However, in the last few years many nations have taken a renewed interest in the region. The thinning of the polar ice cap has spurred a sudden emphasis on the Arctic. For years, scientists have known that its ice cap is thinning. Satellite imagery has shown that the Arctic ice cap is already nearly 30 percent smaller than it was twenty-five years ago. This thinning has caused the Arctic region to be more accessible to surface navigation. The number of ships transiting the Northwest Passage has increased steadily over the last decade as well as the number of vessels navigating in the Canadian Arctic provinces.

Suddenly, the nations in the region have reemphasized their interest in and even claims to resources in the Arctic. This summer, the Russians sent a nuclear-powered icebreaker and a research ship with two deep-ocean submarines to the Arctic. In August, the submarines planted a Russian flag, encased in titanium, on the Lomonsov Ridge to buttress its 2001 claim that the ridge is an extension of the continental shelf and therefore Russian territory. Canada has announced plans to build a new fleet of icebreakers and open an Arctic deepwater port. For its part, the United States has dispatched an icebreaker, the United States Coast Guard Cutter Healy,

to the area. According to an August 13, 2007, National Oceanographic and Atmospheric Administration press release, the Healy's mission is "to map the sea floor on the northern Chukchi Cap . . . to better understand its morphology and the potential for including this area within the United States' extended continental shelf under the United Nations Convention on Law of the Sea (UNCLOS)." UNCLOS, concluded Dec. 10, 1982, entered into force Nov. 16, 1994, reprinted in 21 I.L.M. (1982). A 2001 study conducted by the United States Navy's Office of Naval Research concluded that reduced ice in the Arctic will require increased naval and air operations. See U.S. NAVY, OFFICE OF NAVAL RESEARCH, NAVAL ICE CENTER, NAVAL OPERATIONS IN AN ICE-FREE ARCTIC (Apr. 17–18, 2001).

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Under UNCLOS, countries, including nonsignatories, have exclusive rights to seabed resources from the shoreline to 200 nautical miles. Outside of 200 nautical miles, the treaty allows a country to present evidence that the seabed is connected to that part of the continental shelf that is part of the country's territory. Two factors drive this rush to stake claims to the Arctic seabed. First, some experts think the area contains vast oil, gas, and mineral resources. Second, the thinning of the polar ice cap, whether caused by anthropomorphic or natural warming, allows access to previously unreachable areas.

This rush to claim the Arctic is reminiscent of early efforts to conquer Antarctica. At the beginning of the twentieth century, many countries were eager to claim at least a portion of Antarctica. However, the 1959 Antarctic Treaty (12 U.S.T. 794, 402 U.N.T.S. 71, signed Dec. 1, 1959, entered into force June 23, 1961) suspended all claims to the continent and prohibited all military activity. There is no such protection for the Arctic region, and without one, military operations in the area increasingly are more likely to occur. For example, throughout the summer of 2007, Russian Bear bombers conducted at least seven exercises in the Arctic. This level of activity has not occurred since the Cold War

and may be related in part to the increased accessibility to the Arctic Ocean.

Where to Go from Here

As stated previously, the military has a long history of preparing for catastrophic events such as global climate change. It regularly trains for and executes the types of operations—disaster assistance, humanitarian relief, stability operations—that will be most needed to respond to the consequences of climate change. Moreover, in the spring of 2007, the CNA Corporation brought together eleven retired three-star and four-star admirals and generals to provide advice, expertise, and perspective on the impact of climate change. Their insights reflected the collective wisdom of the commanders who were called upon to respond to past calls for assistance. CNA Corporation, *National Security and the Threat of Global Climate Change* (2007). These leaders stressed the need for the military to plan for the effects of global climate change. The panel recommended that the United States integrate the national security consequences of global climate change into defense planning. There is no reason to think the Department of Defense will not follow this recommendation.

A proposed starting point may be for the next versions of the National Defense Strategy and the National Military Strategy to recognize the various threats posed by global climate change. With appropriate changes to these documents, combatant commanders, such as AFRICOM, can begin planning for the types of impacts that global climate change will have in their areas of responsibility. In turn, the individual military services can then begin determining what additional training may be necessary to respond to the missions that may be necessary to respond to these risks.

Of course, Congress also may force a more formal approach to planning for global climate change. In the spring of 2007, Senators Dick Durbin (D-IL) and Chuck Hagel (R-NE) introduced S. 1018, the Global Climate Change Security Oversight Act. This bill seeks to address security risks posed by global climate change by requiring both the Central Intelligence Agency (CIA) and the Department of Defense to assess the national security implications of climate change. The measure also directs the Department of Defense to undertake a series of war games to determine how global climate change could affect U.S. security, including "direct physical threats to the United States posed by extreme weather events such as hurricanes." For the CIA, it requires the director of national intelligence to conduct the first-ever National Intelligence Estimate (NIE) on global warming. This NIE would identify the regions at highest risk of humanitarian crisis and assess the odds of wars erupting over diminishing resources.

Whether this bill ultimately becomes law or fails, the military must continue to plan for the results of global climate change. Regardless of the results of political, scientific, and moral debate about the causes, the military must prepare. Failure to plan runs counter to military strategy and will only hamstring the inevitable response to effects of climate change. That is a risk the military cannot accept. 🌳