June 1, 2016

The Honorable John Boozman

United States Senate

141 Hart Senate Office Building

Washington, D.C. 20510-0406

Dear Senator Boozman,

I am writing you today in order to bring to your attention a very fine and disturbing article that appeared in the June 2016 issue of Scientific American by Andrew Holland.

Not only is climate change endangering our planet by increasing species extinctions, reduction of coral reefs, mangrove forests, and tropical rainforests, threats to small island states in the Pacific as sea levels rise, increasing drought threats in Africa, more severe flooding in densely populated river deltas in Asia, and more severe weather in hurricane prone zones, it is hitting close to home by threatening our national security. Please take the time to read this letter I’ve enclosed by Mr. Holland.

Thank you.

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**PREVENTING TOMORROW'S CLIMATE WARS**

Scientific American, June 2016

The U.S. military is taking steps to limit the chance that worsening droughts, rising seas and melting Arctic ice will hasten uprisings that threaten national interests

By Andrew Holland

Andrew Holland is director of studies and senior fellow for energy and climate at the American Security Project, a nonpartisan national security think tank. He has worked on the security threats of climate change since 2007 and has testified before Congress about the U.S.’s future in the Arctic.

IN BRIEF: Climate change is accelerating instability in certain regions and multiplying threats in others. The American military is taking action to prevent consequences that could endanger U.S. interests. In Africa, the military is trying to lessen conflicts arising from expended drought and loss of farmland. In the Asia-Pacific region, it is helping small nations recover from severe storms so they can remain strong to resist Chinese assertiveness. In the Arctic, it is promoting international laws that would limit Russia from claiming resources and shipping routes. It is unclear whether the military will commit enough money to sustain such operations. And a Republican president might end support, dismissing climate change as not real.

Democrats and Republicans may often be at odds over climate change, but the U.S. military is not waiting for the debate to be settled. It is preparing for a hotter world, which is already altering geopolitical relations and could lead to armed conflict. The U.S. Department of Defense breaks the menace into two parts: a direct threat to its infrastructure (think naval bases that face rising seas) and the indirect threats posed around the world if societies become destabilized. The first danger is relatively easy to prepare for: figure out what is vulnerable, then strengthen the infrastructure or move away from the danger. The second threat is altogether more complicated. Weather, governments and societies are complex systems, so predicting how each will react to higher temperatures is difficult. Yet credible voices have found clear links; a 2015 study published in the Proceedings of the National Academy of Sciences USA, for example, noted that climate change fueled the beginning of Syria’s civil war by making a regional drought deeper and longer. That drought, when combined with the government’s refusal to deal with crop failures and livestock deaths, pushed hundreds of thousands of people to migrate from their farms into cities such as Aleppo and Raqqa. Once protests began in the country in early 2011, many people with little to lose and resentment toward the government joined in. The unrest turned to civil war when the Syrian government started shooting protesters, and that civil war allowed ISIS, also known as the Islamic State of Iraq and Syria, to rise, terrorizing the world. The U.S. military does not explicitly say that climate change will directly cause wars, but it does call it an “accelerant of instability” or a “threat multiplier.” Such language appears in the Department of Defense’s (DOD) formal 2014 Quadrennial Defense Review, its major planning document for the next four years. It also kicks off the department’s 2014 Climate Change Adaptation Roadmap, a strategic analysis of how to begin to tackle climate threats. This past January the department issued a directive telling senior leaders they must now assess and plan for the risks posed by climate change. One new expectation is that humanitarian assistance and disaster response, limited to occasional missions in the past, will become part of almost every deployment because the number of natural disasters worldwide is increasing significantly. The military has not suddenly become an arm of the Peace Corps. Its mission is to safeguard U.S. interests around the world. Protecting human lives can prevent struggling countries from becoming failed states. Recent history has shown that failed states, such as Afghanistan and Syria, present real threats to U.S. national security by destabilizing regions and breeding terrorists who could threaten Americans. Concern over climate change feeding violence extends beyond the Defense Department. In October 2015 three former defense secretaries, two former secretaries of state, and 40 senators, military commanders and national security experts. Republican and Democrat-published a full-page open letter as an ad in the Wall Street Journal saying that climate change is “shaping a world that is more unstable, resource-constrained, violent, and disaster-prone.” The U.S. military is focusing on two hotspots where climate change could lead to new conflicts-sub-Saharan Africa and the Asia-Pacific region. And it is carefully watching a third, the Arctic. A fourth theater, the Middle East, could also be on the list, but the U.S. Central Command is currently preoccupied with ongoing conflicts there in Syria, Iraq, Yemen and Afghanistan. AFRICA: DROUGHT AND TERRORISM Geographers often judge Africa as the continent most vulnerable to unrest in response to climate change because poverty is widespread, much of the population relies on rain-fed subsistence agriculture, climate variations can be extreme and governance in numerous nations is poor. Disease outbreaks, crop failures, persistent ethnic and religious rivalries, and corruption abound. The continent’s population is expected to grow rapidly from 1.2 billion today to double that, or more, by 2050. Adding the stresses of climate change to this already dangerous brew, it is thought, could accelerate the existing threats and tip fragile states toward war. In fact, it already has. In northern Nigeria deforestation, overgrazing and increased heat from global warming have turned what was once productive farmland and savanna into an extension of the Sahara Desert. Lake Chad has lost more than 90¸ percent of its original size from drought, mismanagement and waste. Together these factors, along with a Nigerian government that was perceived as unresponsive, led the local population into poverty and prompted migrations to find sustenance and safety. Andrew Holland is director of studies and senior fellow for energy and climate at the American Security Project, a nonpartisan national security think tank. He has worked on the security threats of climate change since 2007 and has testified before Congress about the U.S.’s future in the Arctic. June 2016, ScientificAmerican.com 63 DAN KITWOOD Getty Images (protester); EDGAR SU Reuters (typhoon destruction); HANNES RADA Getty Images (icebreaker) The violent Islamist insurgent group Boko Haram stepped into the miserable vacuum left by these factors. Though originally focused on northern Nigeria, in March 2015 the group pledged allegiance to ISIS, demonstrating a clear threat to U.S. allies and interests. A chain of causation from climate change to desertification, to food insecurity, to migration and then to conflict fueled Boko Haram’s rise. The main mission of the U.S. military’s Africa Command (AFRICOM) is to contain existing threats such as Boko Haram and to prevent new ones from starting. (AFRICOM is one of six combat commands based on geography that the U.S. military has formed to cover the globe. Although the Joint Chiefs of Staff and the secretary of defense give direction, each command plans most of its operations.) Scientists know that warming in Africa will lead to more extreme weather and less water availability, which will lead to lower food productivity in places that already struggle with food security. Warmer temperatures are also allowing mosquitos to expand their range, increasing disease transmission. Those trends, in turn, could cause more poverty and migration, which could lead to local conflicts over increasingly scarce resources, thereby undermining the stability of states and leading to violent uprisings that could rear terrorists. The military’s intent is to cut this chain of causation early enough to prevent a war from starting. One primary strategy is to help build accountable governments and government institutions, nationally and locally. To do that, the military has to know which countries are most vulnerable to climate-related conflicts and then devote resources to strengthening them. To that end, the DOD funded a 2014 study by the University of Texas at Austin’s Climate Change and African Political Stability program. It identified the most vulnerable regions of the continent. Researchers produced granular maps that overlaid climate and other security threats, showing “hot zones” where conflict would be most likely. One particular zone was the small Central African state of Burundi. Sure enough, in early 2015 a conflict began there when President Pierre Nkurunziza sought a third term in office, even though the constitution limited him to two. Protests and an attempted coup d’état killed roughly 500 people and displaced at least 250,000 more. A cocktail of factors-including climate change-made conflict in an already unstable country more likely. But a full-scale civil war did not erupt, because the Burundian military stayed neutral throughout the crisis. And that neutrality was a testament to the American military, which trained, equipped and reformed the Burundian armed forces over the course of a decade. Because the U.S. military does not have many boots on the ground or fleets of ships around Africa, AFRICOM’s leaders see their role as a hybrid “civil-military” command that works with other parts of the U.S. government, such as the U.S. Agency for International Development, to prop up military and government institutions in African countries. It is ironic that one of the best ways to prevent climate change from sparking conflict has nothing to do with environmental measures. THE PACIFIC: STORMY SEAS. There is no shortage of American military power in the Pacific, and the country is shifting even more of its overall might into this region. The military will focus 60¨percent of U.S. Air

Force and Navy troops on the Pacific by 2020, up from about 50¨percent in 2012. The U.S. Pacific Command (PACOM) has more than enough traditional military threats to care about, including nuclear blackmail in North Korea, boundary disputes in the South and East China Seas, tensions over the political status of Taiwan and the rising military power of China. Climate change adds two main, overlapping threats to people in the Pacific: more frequent and intense storms caused by warmer oceans, accompanied by rising sea levels. Together these developments could threaten the existence of small island states such as the Marshall Islands, Tuvalu or Micronesia. Sea-level rise could inundate key food-growing regions such as the Mekong River Delta, and storm surges are threatening the long-term viability of major population centers such as Shanghai, Jakarta, Manila and Bangkok. In 2014, a year that did not break any records for frequency or intensity of storms (as 2013 and 2015 did), natural disasters affected 80 million people and caused almost $60 billion in damage, according to the United Nations. The military’s overall aim is to maintain peace, freedom of trade and international law. Meeting those goals in this economically growing region is challenging. Of special concern to U.S. military leaders is China’s rapidly expanding naval strength and assertiveness there, which, if uncontested, could allow China to control the area’s seas. More than half of the world's trade by ship passes through the South China Sea alone, where China is building military bases on islands it has annexed and physically expanded. The Philippines and other nations claim territory or rights to some of these islands, but Chinese leaders say the land belongs to them. Climate change factors into the U.S. strategy to build alliances in the region. In cases of natural disasters such as typhoons, which are getting stronger because of climate change, the U.S. Navy is often the only force with the logistical experience to arrive quickly, with enough people and materials, to make a difference immediately after any destruction. China’s navy does not have the capability, and the country rarely provides aid to Pacific nations following calamities. The U.S. has solidified alliances with countries around the Pacific by intervening at their hour of maximum need. A dramatic example occurred in November 2013. Super Typhoon Haiyan hit the Philippines with winds of 195 miles per hour. The storm drove water inland at 46 feet above sea level in some places. More than 7,000 people died, making Haiyan the deadliest typhoon in Philippine history. Immediately after the storm people became desperate for aid. Credible reports came in that the New People’s Army, an armed wing of the Communist Party of the Philippines, was attacking government convoys of relief supplies going to remote areas. In the city of Tacloban, eight people were killed, and more than 100,000 sacks of rice were looted from a government warehouse. Society was unraveling. In response, then Secretary of Defense Chuck Hagel ordered the USS George Washington’ s battle group, which was on a port visit to Hong Kong, “to make best speed” to the Philippines. Once the aircraft carrier arrived, 13,000 soldiers, sailors, airmen and marines provided food, freshwater and supplies. Their presence stopped the street violence, severing the chain between climate change and conflict. Less than six months later President Barack Obama visited Manila to sign a new Enhanced Defense Cooperation Agreement that would deepen the alliance between the U.S. and the Philippines. Certainly a big motivation for signing this treaty was to counter China’s assertiveness in claiming and occupying islands in the South China Sea. But the quick U.S. response to Haiyan reminded the Philippine government and people, who historically had been skeptical of American military engagement, why it was important to have the U.S. Navy on their side. Cementing alliances is crucial to U.S. efforts to counter China in Asia. Admiral Samuel Locklear, the recently retired commander of PACOM, said in 2013 that climate change could “cripple the security environment” in the Pacific by destabilizing the region. If an American ally always fears the next typhoon, it is unlikely to invest in the naval forces necessary to deal with traditional security threats, such as the territorial expansion of a rising power. PACOM activities now include annual events such as the high-level Pacific Environmental Security Forum, coordinating military and civilian communications networks and helping to connect and train military personal, civilian aid workers, local governments and the U.N. The American armed forces are also helping to train Pacific militaries to fight and defeat an enemy, in part through exercises with names such as RIMPAC, Cobra Gold and Balikitan. The teams practice amphibious assaults, major naval actions and combined air defense. These multilateral exercises now also include a simulated humanitarian-assistance mission.

THE ARCTIC: OPEN TO AGGRESSION U.S. engagement in the Arctic is different. The Arctic is warming faster than anywhere else on earth. In less than a decade the territory has undergone a fundamental change in state, from an ocean world enclosed in ice to one open to human exploitation. Sea ice has diminished so extensively that both the Northern Sea Route over Russia and the Northwest Passage over Canada are now open to travel and energy exploration for many months out of the year. Indeed, the rapid melting of Arctic sea ice in 2007 was one of the catalysts prompting the military to think about climate security implications because the U.S. Navy would have a new ocean to patrol. Ironically, though, the military’s preparation for the security consequences of climate change in this part of the world seems surprisingly weak. The Arctic falls under the U.S. Northern Command (NORTH - COM), but the European Command (EUCOM) also plays a role because it is responsible for any military action involving Russia, which is the preeminent military power in the Arctic. In many ways, the commands face a traditional suite of security challenges: rivalries among great powers, overlapping claims to resources and disputes over freedom of navigation. A global rush is on to secure the oil and gas that the U.S. Geological Survey says sit underneath the ocean. Shipping companies are hurrying to build Arctic-capable ships that can transit over the top of the world. And countries as far from the Arctic as Singapore and India are pushing to join the Arctic Council, an intergovernmental organization of the eight countries that border or hold Arctic territory, to ensure their interests are represented. Seeing the scramble begin, in November 2013 the DOD outlined an Arctic strategy. It focuses on defusing potential tensions by promoting diplomacy and boosting the power of transnational institutions. On paper, the international rule of law in the Arctic is strong; claims to territory in the Arctic Sea are governed by the U.N. Convention on the Law of the Sea (although the U.S. Senate has never ratified it). The Arctic Council is widening its influence by bringing in new observer states (which cannot vote or propose policies) such as China, Italy, Japan and India. The power of institutions can only go so far, however. In the Arctic, the U.S. Navy faces a competitor with more resources and ambition: the Russian Northern Fleet. Headquartered in Severomorsk off the Barents Sea, the fleet is the country’s largest naval operation and conducts regular exercises. It controls the biggest icebreaker fleet on the globe and currently is constructing what will be the world’s foremost nuclear-powered icebreaker. In what are apparently direct orders from President Vladimir Putin, Russia’s military has created a Joint Strategic Command North dedicated to protecting the nation’s interests in the Arctic Circle. The command has reopened cold war bases across Russia’s Arctic coastline, including one at Wrangel Island, only 300 miles from Alaska. Long-range bombers that could test American and Canadian air defenses in the Arctic are being upgraded. And it is worth noting that Putin has displayed a notable disregard for borders and international rules in recent dealings in Ukraine. Few people would have predicted even a short time ago that Russia would invade and annex the Crimea. China has also shown a growing interest in the Arctic, sending its Snow Dragon icebreaker through the Northwest Passage on a highly publicized 2012 tour to Iceland. Despite such stresses, the American military says it sees no need for a surface naval presence north of the Bering Strait, maintaining that it can meet its mission with submarine patrols alone. This strategy is being tested as both Russia and China make very public maneuvers in the Arctic, however. To counter them, the U.S. could also show a greater “presence” with port visits to Iceland and exercises with NATO allies. History has shown time and again that when a powerful nation expands to claim more land, more sea or more natural resources, if other powers do not push back the expansion continues until a border war erupts. Even so, NORTHCOM is reluctant to expand its Arctic presence, in part because of money. It has said that operations in the Arctic would be extremely costly. As it stands, the U.S. Navy does not have the infrastructure, the ships or the political ambition to sustain surface operations there. The coast guard has only two icebreakers, and one of them, the Polar Star, is 40 years old. (Icebreakers are needed, even as sea ice retreats, because they provide year-round access and because ice flows are unpredictable and could trap ordinary ships.) In a September 2015 visit to Alaska, President Obama announced plans to build a new icebreaker by 2020, but it could cost more than $800 million. In a strained federal budget environment, where even the military has to fight for funds, no admiral is looking to add a pricey new mission. In light of the disparity, perhaps the U.S. military sees diplomacy and cooperation as a cost-effective way to ensure that American interests are heard. Such a low-key approach, however, is drawing fire from opponents in Congress. Senator Dan Sullivan of Alaska, a Republican who sits on the Senate Committee on Armed Services, has repeatedly pressed the Obama administration to devote more military resources to the Arctic. He recently convinced Secretary of Defense Ashton Carter to pledge to develop an operations plan that will determine what forces would be necessary to successfully defend American interests in the event of conflict there. As of now, however, the U.S. military is doing little to expand its presence north of the Arctic Circle, even as its competitors invest heavily in the region. For more on how climate change helped to spark Syria’s civil war, see ScientificAmerican.com/jun2016/holland Extreme weather can worsen poverty, leading to uprisings that can destabilize nations, allowing terrorists to expand. The U.S. intends to cut this chain of causation. June 2016, ScientificAmerican.com 65 WILL THE NEXT PRESIDENT CARE? It has taken a long time for foreign policy and national security experts to persuade the U.S. military to prepare for a changing climate. The looming question is whether the early efforts will continue when a new president takes o³ce in January 2017. The issue of climate change remains frustratingly political, with many Republicans dismissing it altogether. Another pressing question is whether the military will devote enough money to climate-related efforts. The Arctic approach is not encouraging. The main source of funding for civilian-assistance operations by the DOD is the Overseas Humanitarian, Disaster and Civic Aid program, but its annual appropriation has declined to about $100 million even though the mission has been expanding. Ultimately the truth always wins: the climate is changing, and the military commands will have to deal with its effects. It is certainly better to plan in advance for possible threats than to respond after the fact. Right now the military will not suffer a sneak attack from climate change-two of the six commands, at least, are starting to face the threat head-on. Whether that is enough to continue to cut the chain from climate change to conflict is uncertain.

MORE TO EXPLORE:

Climate Security Report. Catherine Foley and Andrew Holland. American Security Project, 2012. [www.americansecurityproject.org/climate-security-report](http://www.americansecurityproject.org/climate-security-report)

2014 Climate Change Adaptation Roadmap. U.S. Department of Defense, June 2014.

Response to Congressional Inquiry on National Security Implications of Climate- Related Risks and a Changing Climate. U.S. Department of Defense, July 2015.

[http://archive.defense.gov/pubs/150724-congressional-report-on-nationalimplications- of-climate-change.pdf](http://archive.defense.gov/pubs/150724-congressional-report-on-nationalimplications-%20of-climate-change.pdf%20)

FROM OUR ARCHIVES Syria’s Climate Refugees. John Wendle; March 2016.

THREATS:



Drought weakened Nigeria, bolstering terrorist group Boko Haram, which kidnapped 276 schoolgirls.



Destructive storms, such as Super Typhoon Haiyan in the Philippines, can compromise a Pacific nation's ability to stand up to Chinese assertiveness.



Dwindling Arctic sea ice allows Russian ships to control more territory.