Why climate change is a national security risk

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National Guard members on their way to do search and rescue after Hurricane Sandy. Credit: Photo: Georgia National Guard

Climate change is affecting practically everything on Earth, from natural systems to human endeavors. National security is no exception. The

National Intelligence Council has found that "climate change will increasingly exacerbate risks to U.S. national security interests as the physical impacts increase and geopolitical tensions mount about how to respond to the challenge."

The U.S. Defense Department recognizes that climate change is a "threat multiplier" as it exacerbates existing environmental stresses and security risks. In a 2021 Department of Defense report, Secretary of Defense Lloyd Austin said that almost everything the U.S. Defense Department (DOD) does to defend the American people is jeopardized by climate change—the department's strategies, plans, capabilities, missions, and equipment—and the risks are growing, especially since the world is not on track to meet its Paris Agreement goals. The risks lie not only within U.S. borders; our partner countries impacted by climate change affect American national security interests as well, he said.

Jason Bordoff, director of Columbia University's Center on Global Energy Policy, goes further. "DOD and the wider national security community need to broaden their definition of 'climate risk,'" he said. "There's been plenty of analysis conducted on the exposure and risk to military infrastructure from rising sea level, storms, etc., but there will also be less direct impacts of climate change, such as competition over critical minerals or political instability in resource-rich nations as fossil fuel use eventually dwindles."

Here is a look at the national security challenges posed by climate change.

Direct threats

Infrastructure

Sea-level rise and extreme weather are affecting both the military's

infrastructure and its supply chains. Installations and facilities near coasts are eroding and flooding.

In 2013, Fort Irwin in California experienced flash flooding that cost over $65 million in damages. In Virginia, the Norfolk Naval Station, the world's largest naval base, experiences routine flooding during rainstorms and high tides. This impacts the Navy's ability to conduct operations in the Atlantic Ocean, and hampers its work on ships and submarines in the shipyard. U.S. military bases on Guam and the Marshall Islands are also vulnerable to sea-level rise. Damage from 2018's Hurricane Michael shut down Tyndall Air Force Base in Florida for months; rebuilding it was estimated to cost $3.6 billion. Rising temperatures and extreme precipitation at Whiteman Air Force Base in Missouri can prevent stealth nuclear bombers from taking off.

Global supply chains are also disrupted by extreme weather, which may hinder the military's ability to access critical supplies. Technology sectors such as artificial intelligence, autonomous systems, and semiconductors are essential to U.S. national security. But in 2021, severe flooding in Malaysia, a major hub for semiconductor assembly and packaging, disrupted the supply chain, contributing to a global semiconductor shortage.

Extreme weather makes outdoor training and military exercises difficult and can affect the maintenance and effectiveness of weapons systems and other equipment. This means existing and new equipment will need to be redesigned to enable it to operate in all climate conditions. Weather conditions can also limit the amount of land available for training and reduce water supplies. Heat waves and other extreme weather can decrease personnel productivity and impact military members' health.

Demand for military resources

The physical impacts of climate change increase the frequency, scale, and complexity of defense operations and make them more costly.

Because natural disasters are increasing, the military is being called on more frequently as first responders for disaster and humanitarian relief and must respond to situations beyond their usual scope. For example, between 2016 and 2021, the number of National Guard personnel days spent fighting wildfires increased by 162,000 as droughts have lengthened fire seasons. During Hurricane Sandy, the DOD helped distribute 6.2 million meals, 7.8 million gallons of fuel, medical supplies, and other staples.

Indirect threats

Displacement and civil unrest

Climate change also affects food and water security, degrades the environment, increases the spread of diseases, and disrupts essential services like electricity production. These impacts can drive migration. One study found that if we continue our fossil fuel use trajectory, the probability of multiple simultaneous droughts could increase from the late 20th century average by 40 percent by 2050 and 60 percent by late century.

These droughts could potentially affect 120 million people around the world, triggering crop failures, threatening water supplies, and forcing people to migrate. The World Bank has warned that 143 million people particularly in South Asia, sub-Saharan Africa, and Latin America could end up migrating due to climate impacts.

As migrants enter countries or regions unprepared to deal with them, tensions rise. As we already see on the U.S. southern border, migrants from Guatemala, El Salvador, Honduras, Mexico, Venezuela, and other

nations fleeing poverty, violence, and extreme weather are causing enormous political turmoil.

Climate impacts contribute to poverty, social inequality, political instability, and violence. Weak governments have trouble meeting their people's basic needs, so civil unrest increases. These conditions can lead to shifts in the regional balance of power or result in the failure of states. In some of these cases, the U.S. military may be called upon to come to the aid of its partners to restore stability.

Joshua Fisher, director of the Advanced Consortium on Cooperation, Conflict, and Complexity at Columbia Climate School, said that most of the conflicts he sees in the world are not directly driven by climate change.

"What climate change is doing is impacting already vulnerable societies," he said. "So if there are tensions, if there are large sectors of the population who are marginalized, by and large those same sectors of society are going to be impacted disproportionately by climate change. This opens up a mechanism where climate change can further marginalize and harm already vulnerable people. And that can be the mechanism that leads to increased conflict."

Conflicts around decarbonization

According to a National Intelligence Council report, tensions are also likely to grow as countries argue about how to reduce greenhouse gas emissions to meet the Paris Agreement goals. The conflict will be about which countries bear more responsibility to act and to pay, due to their historic emissions.

"As pressure to decarbonize increases, you can expect more animosity between the developed and developing worlds as poorer countries

wonder, rightly so, why the richer countries, who have created the climate crisis in the first place, are now asking them to limit their consumption of fossil fuels," said Bordoff.

Developing countries will continue to demand more money from developed countries, which have failed to mobilize the promised $100 billion a year by 2020. The UN estimates that developing countries will need at least $300 billion per year by 2030 just for adaptation. Meanwhile, countries that rely on fossil fuels to support their economies see the energy transition as a threat and are attempting to slow progress towards decarbonization.

"The pressure of the energy transition may, if not managed carefully, increase geopolitical tensions, creating new risks to energy security," said Bordoff. "Many of these tensions will be seen in who is wielding influence in the emerging clean energy economy, and who the winners and losers are in a shrinking fossil fuel economy."

Competition for resources

Efforts to achieve decarbonization will hasten the race to secure resources. For instance, as countries try to reduce their own vulnerability by becoming greener and more energy self-sufficient, the demand for rare minerals for batteries and solar panels will increase. According to Bordoff, to get to net-zero emissions by 2050, the demand for critical minerals will go up sixfold. Competition between countries to acquire and process the minerals needed for renewable energy technologies could result in conflict.

"One example of this is a recent rift in the U.S.-E.U. relationship, where we've seen historical allies at odds over perceived unfair protectionism in new clean energy investments," said Bordoff. "Another is the heightened tensions between China and the West with regards to critical minerals,

batteries, or solar panels, with Western leaders concerned about China's dominance over the production of clean energy and the potential weaponization of this market dominance. The longer the world takes to get to net zero, the worse these problems will get."

The Arctic

The melting Arctic ice is opening up the Northwest Passage between the Atlantic and Pacific Oceans.

This could lead to competition for sea lanes for commercial shipping between the United States, Russia, China, and Canada. Countries are also vying for the region's unclaimed land, fish, natural gas, minerals, and other resources.

Most legal matters in the region are determined by the Arctic Council, which is made up of the United States, Russia, Canada, Finland, Sweden, Denmark, Norway, and Iceland. Other countries, such as China, Germany, and India, are considered observer countries. Because the Arctic Council's resolutions are nonbinding, however, it has no enforcement power. Consequently, as military and commercial activity in the region grows, so too could the risk of miscalculation and conflict.

Geoengineering

The U.S. intelligence community is also increasingly concerned about geoengineering, which is now being discussed more often as a viable option for dealing with climate change. This is particularly the case with solar geoengineering, which involves sending reflective sulfur dioxide particles into the atmosphere to reflect solar radiation away from Earth and imitate the cooling effect of a volcanic eruption.

Research on geoengineering is being done around the world, particularly in the United States, China, and India. As there is currently no international governance for geoengineering, it's conceivable that in the future, a single country suffering from climate impacts could decide to conduct geoengineering on its own. This could cause weather patterns around the world to shift, disrupt monsoons, degrade the ozone layer, or trigger droughts that affect agriculture; it could also be weaponized. This could exacerbate tensions between countries or even lead to war.

What the military is doing

It is now DOD policy to consider climate change in all its operations, activities, business processes, decision making, and resource allocation to ensure that military forces continue to be capable and effective.

The DOD is investing $3.6 billion to enhance the resilience of its infrastructure, improve its energy and water capacities, and modernize its operations.

This includes funding for microgrids, energy storage, and renewable energy, electric vehicles, and charging installations. $106 million will be used to improve the energy efficiency of operations. $1.3 billion will be invested into research and development in cutting-edge technology and prototypes of new conveyances. $54 million will go toward incorporating climate impacts into war games and exercises to ensure that the military can operate in all conditions.

"In a warming climate, you're going to see rising seas threaten critical infrastructure, growing geopolitical tensions, larger flows of migration away from the most climate-vulnerable nations, civil conflict driven by resource scarcity, and new venues for conflict," said Bordoff. "Each one of these by themselves would be worrying, but having them play out simultaneously will cause not only a drain on limited resources to

counteract them, but will exacerbate today's worsening geopolitical trends."

He added, "Military leaders need to devote more attention to some of these more complex consequences of climate change so that they can better prepare for them."

The DOD is one of the only organizations in the world with the ability to move materials anywhere around the world in 24 hours, according to Fisher. "And so understanding the national security interest we have in preventing conflicts from escalating into outright violence should be one of the DOD's priorities," he said.

The DOD should look at areas that are vulnerable to climate change, as well as at near- and mid-term forecasts for risks in various regions. "They should utilize the resources they have to prevent conflict, not with military action, but rather by supporting rule of law programs or emergency support, or providing provisions, to try to prevent conflicts from escalating."

Fisher has been impressed with the DOD's handling of the topic of climate change. "The DOD has been able to be frank and sober about it, but understand that it is a national security threat, and treat it as such, rather than getting mired in the politics of it," he said. "The more they can maintain that focus, the better I think they'll be."

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