



Statement for the Record

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FOR A HEARING ON

“The National Security Implications of Climate Change”

BEFORE THE

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Chairman Schiff, Ranking Member Nunes, and distinguished members of the Committee, thank you for the opportunity to discuss the Intelligence Community's (IC) assessment of the national security implications of climate change.

Changing climate is just one of a multitude of factors—alongside things like demographics, economic and political factors, and technology—that the IC considers when it examines global strategic trends and the potential threats they pose to U.S. national security. The IC does not assess the direct effects of climate change on the U.S. homeland, nor does it evaluate the science behind the scientific reports. To inform our judgments, we rely on reports produced by U.S. federal science agencies, peer-reviewed scientific journals, and reports from international scientific organizations. Complexities in Earth's systems, uncertainties in modeling, and the unpredictability of human choices make it difficult to project when and where specific disruptive events and other climatological effects will have the most significant national security effects.

Climate Trends and National Security

These scientific assessments, which indicate that Earth's atmosphere and oceans are undergoing a long-term warming trend, the rate of which will depend on greenhouse gas emissions, raise critical national security questions. Studies indicate rising temperatures can amplify extreme events such as heatwaves, heavy precipitation, storm surges, droughts, wildfires, and some tropical cyclones. Other effects, which already are in evidence, include rising sea levels, melting glaciers and ice sheets, thawing permafrost, soil degradation, ocean acidification and deoxygenation, animal and plant species redistribution, coral bleaching, and changes in ocean and atmospheric circulations.

We assess that such impacts from climate change almost certainly will have an increasingly significant direct and indirect effect on the social, political, economic, and security challenges faced by the United States and other countries during the next few decades. The combination of other environmental stresses and human activities makes it challenging to discern the national security implications of climate change in isolation. In many cases, climate change is likely to exacerbate existing stresses, such as water or food shortages that worsen social and political conditions in a country.

In particular, the effects of climate change are likely to exacerbate existing challenges, including:

- The potential for political and economic unrest in some countries.
- Social and political tensions in both partner nations and elsewhere.
- Food prices and availability.
- Countries' investments and economic competitiveness.
- Stress on US military operations and basing.
- Risks to human and animal health.
- The drivers of disruptive human migration.

We assess that the security risks for the United States, linked to climate change for the next several years, will arise primarily from distinct extreme weather events and from worsening pre-existing problems, such as water and food security, around the world. During the next 20 years and beyond, climate change will increasingly compound extreme events on top of broader climate stresses.

Implications for Specific Topics of Interest

The specific topics the Committee has asked us to testify about are among those the IC has been exploring that are likely to be affected by climate change.

Effect on the stability of countries

In the coming two decades, we assess that an increasing number of countries will encounter climate-related hazards—such as extreme weather events disasters, drought, or infrastructural damage—that stress their capacity to respond, cope, or adapt. We already have seen water crises exacerbate social unrest in and emigration from fragile states in the Middle East and North Africa, such as Syria and Libya, in part by aggravating the effects of other factors, such as preexisting socioeconomic grievances and ineffective government institutions, according to a joint UN-World Bank study. With continued rising temperatures, more countries are likely to face such challenges with greater frequency, increasing the risk of unrest, migration, and interstate tension.

- Countries with weak political institutions, poor economic conditions, or where other risk factors, such as political strife are already present probably will be the most vulnerable to climate-linked instability or migration and the hardest pressed to respond to and recover from a crisis.
- According to a 2018 USAID-funded report, 26 of the 39 states with the highest or high state fragility have a large number of people or large proportion of the population facing high risk from the effects of climate change. Burma, Egypt, India, Nigeria, and Democratic Republic of Congo have the greatest number of people in highly exposed areas.

Competition over resources

Disputes over land and water resources increasingly trigger social violence and internal conflict, particularly when they build on preexisting social and political grievances. More frequent extreme weather events, ranging from droughts to intense rainfall, would significantly threaten agricultural production and increase food price volatility. As the climate changes, disputes over water and access to arable land are likely to grow, prompting more such local conflicts.

- In 2018, disputes over access to water and grazing land were a factor that fueled conflict between farmers and herders in Mali that reportedly killed 25 people. Also in 2018, water protests in southern Iran turned violent when security forces opened fire on demonstrators.
- Ocean warming is likely to adversely affect marine fish populations, particularly in East Asia and in the North Sea. Disputes over fishing rights and access have become major points of contention for countries that rely heavily on fishing for food or income.
- Long-term climate effects—such as more very hot days and nights and changing precipitation patterns—will compound land, water, and energy constraints to raise food prices. Heatwaves

and reduced precipitation threaten livestock directly and reduce fertility, pasture yields, milk production, and disease resistance.

Changing conditions in the Arctic

We assess that changing conditions in the Arctic will have significant security, economic, and social implications for both Arctic and non-Arctic states. For example, longstanding scientific research by the National Oceanic and Atmospheric Administration states that warming rates in the Arctic are more than twice as fast as the rest of the Earth, which means the Arctic could be free of ice cover in the summer by 2030-2040. An increasingly navigable Arctic makes the region more consequential for economic and security reasons.

- The region is likely to attract increased commercial activity, such as mining, energy exploitation, transportation, and fishing.
- The melting of sea ice would drastically shorten routes between Asia, Europe, and North America.
- The Arctic—which could contain well over 90 billion barrels of oil, 1,700 trillion cubic feet of natural gas, and 44 billion barrels of liquid natural gas—will draw continued interest in offshore drilling, although large-scale exploitation faces commercial challenges for the foreseeable future.

Russia and China are dramatically increasing their activities and investment in the Arctic. Russia in 2017 pledged \$2.7 billion to develop its continental shelf, and longer openings of the Northern Sea Route (NSR) could advantage Russian liquefied natural gas exports to Asian markets that U.S. companies are seeking to develop. China has invested in new gas infrastructure projects and icebreakers, and its cargo ships are increasingly transiting the NSR.

Human migration

In some regions, climate-related hazards are likely to contribute to migrations that exacerbate social and political tensions, some of which could overwhelm host governments and populations. As sudden extreme weather—such as floods, heatwaves, and severe tropical storms—becomes more frequent this almost certainly will increase the number of displaced people, with effects felt in particular in regions that are unaccustomed to or unprepared for such events and areas that have already absorbed large influxes of migrants, such as the Levant and Sahel. Rising sea levels and unexpectedly large storm surges could threaten small island states and low-lying coastal regions, including many megacities, with flooding and saltwater contamination of freshwater.

- The World Bank estimates that significant levels of warming could push tens of millions of people in Sub-Saharan Africa, South Asia, and Latin America to migrate within their countries by 2050.

Effect on U.S. bases and force posture

We assess that climate-related phenomena will continue to affect some military capabilities and facilities globally, including military bases and training ranges, as we have already seen in the Marshall Islands. U.S. bases in the Marshall Islands are expected to be flooded annually by 2040, if

the global sea level continues to rise at its current rate, according to a study led by the U.S. Geological Survey. U.S. and allied military installations, operations, and supply networks are vulnerable to recurrent climate events such as higher temperatures, rising sea levels, flooding, drought, wildfires, and changing Arctic conditions. These factors might also increase demands for humanitarian assistance and disaster response from the United States and its allies and partners.

China's role on climate change

China seeks to boost its image as a leader in combating climate change, despite its role as the largest carbon emitter and its continued support for high-emissions development globally. China remains the world's largest coal consumer and is building mostly low efficiency, coal-fired power plants abroad. Although China played a pivotal role in 2015 to broaden the scope of commitments by developing countries under the UN Framework Convention on Climate Change process, and was the first emerging market country to announce a "nationally determined contribution" for the Paris Agreement, we do not expect Beijing's targets to impose significant costs to the Chinese economy.

- China seeks to establish itself as a renewable energy superpower, and touts its more than \$100 billion in annual investments in green technologies. China is now the world's largest producer, exporter, and installer of solar panels, wind turbines, batteries and electric vehicles, and controls 29 percent of global renewable energy patents.

Climate geoengineering

Unilateral efforts by countries or groups to test or deploy geoengineering—a largely theoretical field exploring how to moderate the impacts of climate change through methods such as injecting aerosols into the stratosphere or chemically altering the reflectivity of clouds—have the potential to heighten tensions among states. The authority of actors to conduct such activities with global implications would be in dispute. Further, it may be impossible to fully attribute outcomes to geoengineering activities, rather than from natural variability or other emissions of greenhouse gases.

Global governance and multilateral responses

Political disputes among nations and various stakeholders are hampering international policy-driven efforts to reduce emissions, leading some countries to look for alternative ways to increase international pressure on countries. Some adversely affected countries and interest groups may take their grievances outside of the UN Framework Convention on Climate Change-led process and seek redress through international judicial mechanisms. For example, since 2011 several small island states have proposed seeking an advisory opinion from the International Court of Justice related to climate change.

Other adverse effects on human security

Health: We assess that extreme heat will add to global health threats in the coming years by contributing to deaths from cardiovascular and respiratory disease, particularly among the elderly. Warming trends, in combination with more rainfall and flooding, are likely to increase the frequency of water-borne diseases and diseases transmitted by insects and snails. Extended transmission seasons of important vector-borne diseases are likely to occur across a potentially larger geographic range.

Terrorist recruitment

Terrorist groups have exploited natural disasters and water and food shortages in countries including Iraq, Nigeria, Pakistan, Somalia, and Syria to boost recruitment and support among local populations. Food, water, and land shortages often spark conflict or create grievances, which are among the many issues that terrorist groups are able to exploit to gain recruits or safe haven.

Closing:

Climate change and its resulting effects have wide-ranging implications for national security, presenting risks and challenges for the U.S. The IC plays an important role in identifying and analyzing these implications for policymakers. Thank you for the opportunity to appear before the Committee today to share our assessments, and I look forward to your questions.