

## PART TWO: CLIMATE CHANGE & GLOBAL SECURITY

Climate change will exacerbate regional and local tensions in ‘hot-zones’ around the world. In these regions, the impacts of a changing climate will act as an accelerant of instability by multiplying problems like water scarcity, food shortages, and overpopulation.

As a global superpower with military forces deployed around the world, the interests of the U.S. and its allies will be impacted by a changing climate, especially in certain ‘hot-zones’ detailed within this chapter.

### In Brief

- The geopolitical consequences of climate change will be determined by how it affects and interacts with local political, social, and economic conditions as much as by the magnitudes of the climatic shift itself.
- A changing climate acts as an accelerant of instability around the world, exacerbating tensions related to water scarcity and food shortages, natural resource competition, underdevelopment and overpopulation.
- The near-term impacts of climate change are likely to have a disproportionate effect on poor countries with weak governance structures, particularly in Africa and Asia.
- Because the U.S. is a global power with strategic interests around the world, climate change is strategically important to the U.S. through the impacts it has on the regional stability of our allies.
- Climate change will cause an increase in frequency of disaster relief responses by U.S. and allied military forces.
- Though climate change will have global implications, there are specific ‘hot-zones’ that national security planners should focus on. These include Sub-Saharan Africa, South Asia, the Middle East, Latin America, the East Asia-Pacific, and the Arctic.

## The Geopolitical Consequences of Climate Change

The climate is changing – the shift in global climate is scientifically proven, though the extent of the projected change is a subject of debate. Predictions of weather and climate only tell us part of the story, though. The geopolitical consequences of climate change will be determined by how it affects and interacts with local political, social, and economic conditions as much as by the magnitudes of the climatic shift itself.<sup>1</sup>

Academic researchers have been debating the links between climate change and conflict for decades.<sup>2</sup> The academic consensus is that climate change alone is unlikely to be a primary cause of conflict, but it is an important secondary cause.

A changing climate will increase vulnerability by exacerbating tensions related to water scarcity and food shortages, natural resource competition, underdevelopment and overpopulation. It acts as an accelerant of instability, which may lead to violence. These disruptions will burden civilian and military institutions around the world, including the U.S. military.<sup>3</sup>

Climate change is an independent variable, but its impacts will be deeply interwoven with other variables that both increase and decrease security. For example, a climate change-related event may create a self-perpetuating crisis, especially if there are not structures in place to prevent such a crisis.

According to the National Intelligence Council (NIC), by 2025, “unprecedented economic growth, coupled with 1.5 billion more people, will put pressure on resources—particularly energy, food, and water—raising the specter of scarcities emerging as demand outstrips supply.”<sup>4</sup> For example, a food shortage exacerbated by increased temperatures and population can lead to conflicts over resources, which may drive human migration to a resource rich area. This may increase stress on food and water in that region, beginning the process again.

Climate change is one important variable in this long chain of events, even if it is never the sole cause of any specific problem.

The near-term impacts of climate change are likely to have a disproportionate effect on poor countries with weak governance structures, particularly in Africa and Asia.<sup>5</sup> During the next 10 years, many countries important to the U.S. will experience water problems such as droughts, floods and poor water quality.<sup>6</sup>

Weak states may risk failure or increased regional tensions from the inability to cope with sudden shocks (such as drought) and long-term stresses (such as decreased agricultural yield). Global climate change impacts are vital to U.S. security interests because they affect defense, diplomacy and economics.<sup>7</sup>

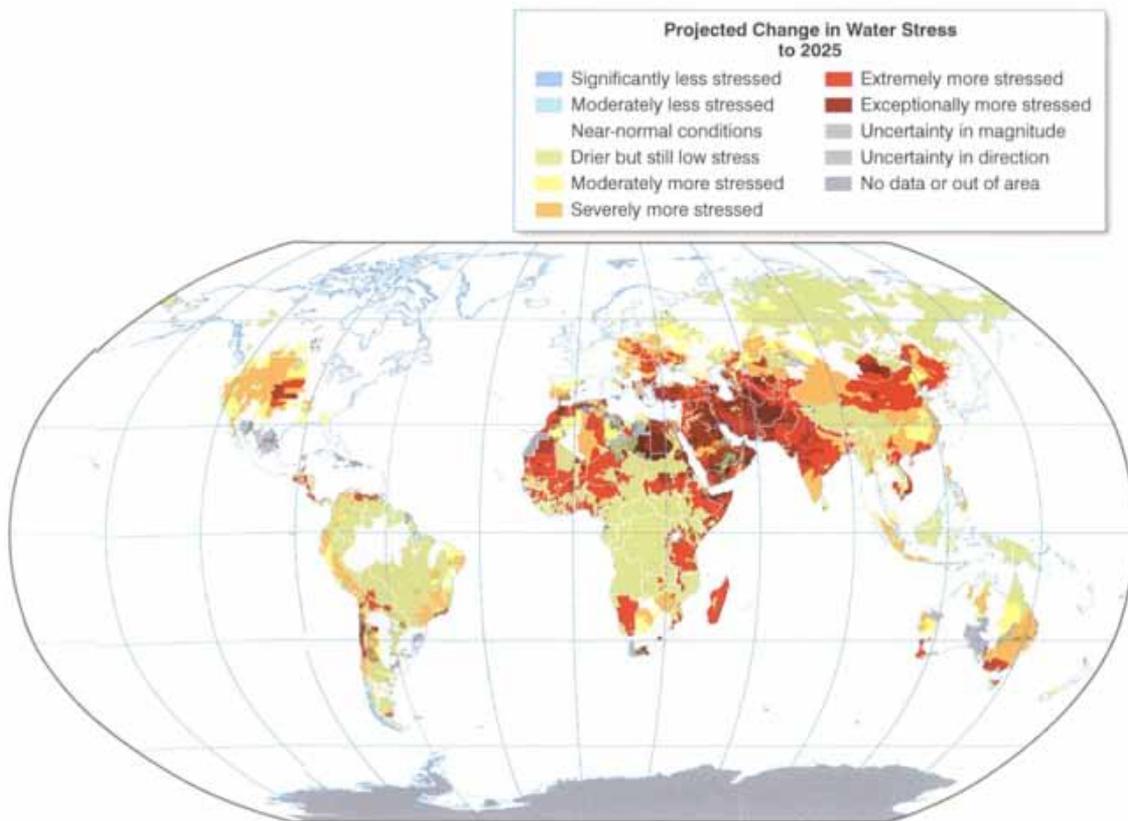
Because the U.S. is a global power with strategic interests around the world, these impacts require the attention

*“Climate Change is already a national security imperative. Combatant Commanders are preparing now for the consequences of climate change in their areas of operation. The destabilizing impacts in key regions of the world are indisputable and will likely only worsen in the years ahead.”*

**Lieutenant General  
Daniel Christman, USA (Ret.)**  
ASP Board Member

of security planners in Washington. The immediate instabilities linked with climate change will occur in the most vulnerable regions of the world where the U.S. has strategic interests. These include interests in fighting terrorism, such as in the Horn of Africa; securing energy or mineral imports, like in West and Central Africa; or ensuring peace along heavily militarized borders, like in South Asia. All the regions will be affected by climate change. Global climate change is strategically important to the U.S. through its impacts on the regional stability of our allies.

Climate change will also cause an increase in frequency of disaster relief responses by the U.S. military; an extreme event affects everyone globally. U.S. and foreign militaries have been increasingly deployed in disaster response capacity for extreme weather events including persistent droughts such as the East African drought in 2011 and the Russian wildfires in 2010. Responding to extreme weather events has become a frequent commitment by our armed forces and will likely continue to be in years to come as extreme weather events increase.



*SOURCE: National Intelligence Council Global Water Security, 2 February 2012*



## **A Regional Look at Global Climate Change and Areas of Insecurity**

Climate change is a global issue that has smaller-scale, regional impacts; its effects will be different across countries and regions.

How these local changes in weather and climate affect security in each region will depend on local socio-economic and political factors.

There is no ‘one-size-fits-all’ response.

Specific ‘hot-zones’ that American security planners should focus on include Africa, South Asia, the Middle East, Latin America and the South Pacific.

Though these are large areas with diverse populations and ecosystems, there are some generalizations about each that planners should make.

## Sub-Saharan Africa

- The U.S. military may face increasing international pressure to play a more prominent role in Africa as the effects of climate change become more pronounced through droughts, water scarcity and food scarcity.
- Increased U.S. support may include strengthening U.S. AFRICOM or allocating money for foreign aid to governments.
- The U.S. military may be required for troop support as weak states, including Somalia and Sudan, face economic and political pressure due to resource scarcity.
- In the case of extreme droughts, like the one in Somalia in 2011, the U.S. may need to provide humanitarian support for displaced peoples and those without food and water.

Africa is the continent most likely to suffer the worst effects of climate change due to its reliance on subsistence rain-fed agriculture, rapidly increasing population and the degradation of natural resources.<sup>8</sup>

The various regions of Africa will be impacted differently by the pressures of climate change, based on individual climate variations. However, these areas are all plagued by similar developmental and political issues that affect a society's ability to cope with environmental pressures.

According to Foreign Policy's 2011 "Failed States Index," 14 out of the top 20 countries are from Africa.<sup>9</sup> The list highlights Somalia (which tops the list), Chad and Sudan (which are listed in "critical" condition) because of factors such as uneven development, weakness of security apparatus and economic decline.

These same factors lead to the mismanagement of natural resources, which creates tension within individual nations.

Extreme droughts and food scarcity from climate change will, and already are, putting pressure on fragile states in Africa. Parts of Africa face a food production crisis, as much of the population relies on subsistence agriculture for income and survival.

Agriculture is the backbone of most African economies<sup>10</sup>; it is the largest contributor to GDP and accounts for 40% of the continent's foreign currency exchange earnings.<sup>11</sup>



A large percentage of countries in sub-Saharan Africa (SSA) already experience water stress because of insufficient and unreliable rainfall or changing rainfall patterns. An estimated 25% of the population (200 million people) currently experiences water stress.<sup>12</sup> As weather extremes increase, threats of water scarcity and food security will become more pronounced.

Decreased agricultural production and water shortages caused by climate change may lead to increased tension and migration, as seen in the Sahel, the region stretching across north-central Africa on the southern border of the Sahara desert.

Decreasing rainfall patterns, combined with intensive land-use have contributed to the desertification of the Sahel region, a “ground zero” for climate change due to its extreme conditions and vulnerability.

The Sahel has faced rapid population growth, poverty and instability for decades. Its population remains heavily dependent on natural resources for its livelihood and the impacts of climate change on food security and resource availability could be dramatic across the region.<sup>13</sup> For example, the recent uprising in Mali was partly induced by droughts and decreased agricultural productivity. This was exacerbated by the inability of the government to address these issues.



The Tuaregs, a traditionally nomadic pastoralist tribe, rose up against the government because of the intersection between drought and unaccountable government, even though Mali had been often cited as a democratic model in Africa.<sup>14</sup>

Many climactic impacts have begun to manifest themselves in sub-Saharan Africa, most notably the 2011 drought in Somalia which displaced hundreds of thousands of people<sup>15</sup> as well as the continued expansion of the Sahara desert.

As the effects of climate change become more intense and apparent in the region, tensions may rise over already stressed resources.

## South Asia

- With the increase of natural disasters and endemic poverty in South Asia, the region will be severely affected by climate change.
- The U.S. may need to provide disaster assistance to the millions who may be displaced by increased extreme weather.
- India is strategically important to the United States as a rising power. The tense relationship between India and Bangladesh and the potential for a large climate-induced migration must be watched carefully.
- The U.S. may be required to provide mediation or troop support if tensions turn to violence.
- The U.S. has strategic military interests in Pakistan and Afghanistan, with numerous military installations (including Diego Garcia air base) that could be compromised by climate change.

South Asia, including India, Bangladesh, Pakistan, Afghanistan, Iran, Maldives, Sri Lanka, Nepal and Bhutan, is one of the world's most poor and illiterate regions as well as the region with the highest levels of underdevelopment.<sup>16</sup>

It is home to nearly one fourth of the world's population, and it is among the world's most militarized regions, with India and Pakistan both sharing a long border and holding nuclear capabilities.<sup>17</sup>

Bangladesh has been ranked as the world's most vulnerable country to climate change, followed by India (2<sup>nd</sup>) and Nepal (4<sup>th</sup>), according to a new Asian Development Bank Report.<sup>18</sup> Approximately 135 million people live in the low elevation coastal zones in Bangladesh, India, the Maldives, Pakistan and Sri Lanka.<sup>19</sup>



Due to the geography of the region, these areas of South Asia will be increasingly affected by the effects of climate change. Poverty and underdevelopment are key factors in South Asia's vulnerability to climate change because they reduce people's capacity to cope with large-scale disasters as well as adapt for future disruptions.

The coastal zones of South Asia contain about 40% of the economic activity of the region and most of its critical economic infrastructure, including ports, fishing infrastructure and mangrove areas. An increase of severe weather, like cyclones, puts these areas at greater risk, ultimately affecting fragile government structures as the economy suffers.

Approximately 80% of the landmass of Bangladesh consists of a delta made up of a complex system of floodplains.<sup>20</sup> It is vulnerable to riverbank erosion and severe flooding, and the increased salinity of riverbeds. All of these factors affect the availability of seafood as well as increased salt intrusion into groundwater, which impacts agricultural viability. For example, just a 45 cm rise in sea level will potentially result in a loss of 10.9% of Bangladesh's territory, forcing some 5.5 million people to relocate.<sup>21</sup>

Attempts to implement adaptation measures are undermined by government corruption and mismanagement, leaving many at the mercy of the environment. Millions of Bangladeshis have migrated into India due to water diversions on the Ganges river. Migration has increased in recent years because of increased environmental erosion, causing the loss of livelihoods and decrease of fresh water sources.

Tensions with India are high after a 210 mile border fence was built to keep out migrants.<sup>22</sup> Should a large-scale environmental disaster occur, like a direct hit from a typhoon, millions of Bangladeshis will lose their homes, livelihoods and will likely migrate towards India and the already overcrowded cities of the region. South Asia is a vastly poor, conflict-prone area, and climate change will further exacerbate those tensions.

*Extreme droughts, rising sea levels and other environmental changes can trigger mass human migrations—and desperate people are disinclined to respect geopolitical borders or traditional ownership of assets.”*

**Norm Augustine**  
ASP Board Member



*A U.S. Marine Corps helicopter over the flooded region of Pakistan, 2010*

## Middle East and North Africa

- The Middle East faces severe water scarcity issues, which has led to droughts and food price spikes.
- These factors partially contributed to the Arab Spring, which required U.S. military and diplomatic support. As climate extremes increase, the U.S. may become increasingly involved in conflicts in the Middle East.
- The Middle East is a key region in the U.S. fight against terrorism and extreme climate changes may exacerbate global terrorism.
- Climate change aggravates existing poverty, social tensions, environmental degradation, and weak political institutions; these factors may impact the numbers of terrorist organizations, especially if the presence of the state weakens.



Water scarcity due to climate change will contribute to instability throughout the Middle East as water supplies shrink. The Middle East is stretched past its water limits and the water politics of the region has been described as a “hydropolitical security complex”.<sup>23</sup> Renewable water sources are already scarce in the arid region, yet 80% of fresh water is used in agricultural practices.<sup>24</sup>

As the climate changes, rainfall patterns become more variable and droughts intensify, food and water security tensions will increase. Rising food prices due to weak agricultural outputs, environmental degradation and migration from rural areas to over-crowded cities have been cited as factors that contributed to the Arab Spring, alongside political repression.<sup>25</sup> Water scarcity is deeply linked to food and economic insecurity and

may lead to social or political upheaval under certain circumstances.

The Middle East is already a politically charged region with overlapping security, ethnic, and religious conflicts. These tensions are multiplied by the interdependence of water sources. For example, Yemen is experiencing a major water crisis, limiting drinking water to one to two quarts per person per day in some regions. Agriculture uses 90% of Yemen's water resources,<sup>26</sup> increasing tensions between cities and the countryside in an already tense state.

The Jordan River and the Tigris and Euphrates Rivers link the water interests of multiple countries. 75% of all the water in the Middle East is located in Iran, Iraq, Syria and Turkey. Conflict in these countries has pushed water management down the priority level in recent years, so water security is at an all-time low.

Water is a potential political tool in this region. Turkey, the upstream state of both the Tigris and Euphrates with a vast dam infrastructure, can cut Syria and Iraq's water supplies.

In 1989, Turkey cut off the water flow to Iraq and Syria after Syrian President Assad increased his support for the PKK (the separatist Kurdistan Workers' Party).<sup>27</sup>

Political relationships between these countries have long been tense and the added pressure of naturally occurring droughts and water shortages caused by Turkey's control of water may have political and security consequences in the region.<sup>28</sup>



*The Atatürk Dam on the Euphrates River in Turkey*



## The Arab Spring and World Food Prices

One of the most important events over the past decade has been the Arab Spring of 2011 that brought down dictators in Tunisia, Libya, Yemen, and Egypt, and continues to reverberate through the region. Although the proximate cause of the unrest was the self-immolation of Mohamed Bouazizi, a fruit vendor in Tunisia, empirical evidence indicates that a spike in local food prices across the Arab world was responsible for setting the stage.<sup>1</sup>

Over the last two decades, there is a strong evidence that food price increases have led to increased political unrest.<sup>2</sup> By late 2010, global food prices had increased by 40% over the year, largely due to drought and wildfire in grain exporting regions of Russia and Eastern Europe, as well as by unprecedented floods in grain-importing Pakistan. Although few of the protesters in Tahrir Square or fighting in Benghazi would have said that they were fighting because of food prices, the empirical evidence shows that high prices made riots much more likely.

Syria is the most extreme example of how drought and food prices combined to foment unrest. The five years preceding the beginning of the unrest in the Spring of 2011 (2006-2010) saw a drought unparalleled in both length and severity in recent Syrian history.<sup>3</sup> Since at least 1900 (when modern recordkeeping began), droughts had only lasted one or two years at most. This drought caused an unprecedented mass migration of 1.5 million people from rural areas to urban centers.

The severity of the drought was increased by the inability of the Assad regime to prepare for or adapt to the extreme conditions. For decades, the Assad regime – both father and son – had ignored water conservation issues and agriculture in general.<sup>4</sup> When the drought destroyed farming communities, it sent new migrants to the cities – most of which were not from the ruling Alawite minority. This placed great strain on urban populations, and exacerbated ethnic and religious strife. This strain is evident in the ongoing conflict within Syria.

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## Latin America

- As a neighbor of the United States, the security of Latin America is a vital interest to the U.S. geographically, economically and politically.
- Climate change may affect weak political institutions in Colombia and Ecuador, as less glacial runoff will cause economic pressures through droughts and decreased crop yields.
- As food and water scarcity becomes a larger issue in Latin America, the U.S. may face pressures from migration or the U.S. military may be required to aid Latin American countries in the event of a major climate event.
- Agricultural markets are deeply integrated between the U.S. and Latin American, meaning that a major drought in the region would have impacts on food prices in the United States.

Latin America includes all of the continental countries of the Americas, from Mexico to Chile and Argentina. The Latin American population will increase to 838 million people by 2050,<sup>29</sup> up from approximately 590 million people at the end of 2011.<sup>30</sup> The region is expected to continue its rapid economic development, putting pressure on food and water resources.

Agriculture is an important aspect of the regional economy; it employs 30-40% of the workforce. Extremes in climate, specifically El Niño and La Niña episodes (variations in surface temperature of the Eastern tropical Pacific Ocean), affect agriculture in Latin America by increasing productivity during the warm (El Niño) phases and decreasing productivity during the cold (La Niña) phases.<sup>31</sup> In addition to this variability, the World Bank estimates that agricultural productivity in Latin America could fall 25% or more by the late 21<sup>st</sup> century due to climate change.

The Amazon rain forest is a defining feature of South America, covering 1.7 billion acres (7 million square kilometers) and affecting precipitation levels around the world.

There is growing evidence that the Amazon is at risk of reaching a “tipping point” due to deforestation and climate change. This would manifest as forest loss leading to a cycle of warmer temperatures and changes in rainfall, which could begin an irreversible process of turning the area into a grassland savannah. This “positive feedback loop” would accelerate climate change, as carbon released from deforestation contributes





*A satellite image of the mouth of the Amazon River in the afternoon, showing how the rainforest creates its own cloud cover each day*

to the decline of remaining forest fragments.<sup>32</sup> This would have global implications because, as the world's most significant carbon sink, the Amazon is critical to maintaining climate stability.

Finally, the glaciers of the high altitude Andes Mountains are at risk of vanishing completely. Higher temperatures are driving glacial melt in the Andean nations of Peru, Bolivia, Ecuador and Colombia.

These regions are dependent on glacial runoff during dry seasons to fuel hydropower plants, which accounts for 50-70% of their electricity supply;<sup>33</sup> provide drinking water for otherwise parched cities like Lima or Quito; and irrigate land for agriculture in what would be a desert.<sup>34</sup>

Glacial melt is an integral part of survival in the Andes and entire glaciers could disappear in 10 years due to rising temperatures; they are melting faster than they can replenish themselves.<sup>35</sup>

This may lead to social and economic strife as agricultural livelihoods are no longer supported, food becomes scarce and drinking water is limited. The melting glaciers are a regional issue that will affect all of Latin America with rising prices and potential migration, due to food and water scarcity.

## South East Asia and the Pacific

- The U.S. has strategic and economic interests in South-East Asia, specifically in terms of China's rise as a global economic power.
- A severe extreme weather event, or a series of them, could have consequences on the economic strength of the region, thereby affecting the global economy.
- The U.S. military has numerous military installations in South East Asia and the Pacific, which are threatened by sea-level rise.

South East Asia and the Pacific are vulnerable to climate change primarily because of their geography. The region is scattered with low-lying island nations that are threatened by rising sea levels. The South Pacific has roughly 25,000 islands alone,<sup>36</sup> with many islands like Singapore and islands in the Philippines and Indonesia that have extremely high population densities. The region is home to 25% of the world's population and 30% of the world's poor, making its people extremely vulnerable.<sup>37</sup>

Since the 1950s, natural disasters, including cyclones, earthquakes and droughts have occurred more frequently than ever before in the South Pacific; population and economic growth mean that they have had larger human impacts. To show the growth, 10 of the 15 most extreme natural disasters during this period have occurred in the past 15 years.<sup>38</sup> Natural disasters, like cyclones, can engulf entire cities and small islands, creating large-scale chaos and damage. Repeated events like this cause the contamination of fresh water supplies and a redistribution of fisheries. Each flood and extreme storm increases the salinity of fresh water and alters the biodiversity on land and sea, with direct effects on the economy, food and water security.<sup>39</sup>



Flooding from extreme events also increases the likelihood of spreading diseases like cholera, typhus, and dengue fever. As the climate changes, flooding is more likely as storms become increasingly unpredictable. In warm-weather environments like South-East Asia, the spread of disease is likely to be fostered by the weather and the increased potential for standing water.

By 2070, 9 out of 10 of the world's most populous cities will be in Asia, including low-lying mega-regions like Bangkok, Manila and Ho Chi Minh City. These cities are growing rapidly and their lack of infrastructure and density makes them particularly vulnerable to flooding and storms.

Higher tides and storm surges wash away underground soil that supports buildings and infrastructure.<sup>40</sup> Seasonal precipitation in the region could rise between 2 and 6% by 2050, putting affecting flood-prone areas in these Asian megacities.<sup>41</sup> As these cities on the coast become more vulnerable to the effects of climate change, so too will their economies and their people.

## Climate Change and the Arctic

- The melting of the Arctic is strategically important for the U.S. – one of five Arctic States – because it will open up new reserves for oil, natural gas, minerals, fishing, as well as transportation routes.
- The Arctic melt may have impacts on U.S. security due to the potential for competition over resources and territorial claims.
- The increased militarization of the Arctic may lead to questions about sovereignty and potential conflict with other countries vying for power in the region.

The Arctic is the region of the world most dramatically transformed by a warming climate. In the past century, the Arctic was only thought of by national security and foreign policy professionals as a superpower battleground between submarines or intercontinental bombers. Today, however, a changing climate is combining with new technologies to open up the Arctic to greater exploration and potential alteration than ever before. The global impact of Arctic resources and the Arctic climate have great strategic importance.

Since 1951, the Arctic has warmed roughly twice as much as the global average.<sup>42</sup> Greenland has warmed 1.5°C, double the global average of 0.7°C. Due to the rise in temperature, there was a 62% loss in the summer minimum volume of Arctic sea ice from 2000-2011. In 2012, Arctic sea ice passed its previous record low, falling below 1.6 million square miles for the first time.<sup>43</sup> If ice loss continues at this pace, some predict that the Arctic could be seasonally ice free by 2025 or sooner.<sup>44</sup>



Arctic warming has global climatic implications. The thawing of the Arctic ice creates a “positive feedback loop” where more exposed arctic water heats up faster than the ice, which in turn heats the air and melts more ice. If temperatures continue to increase in the Arctic, scientists predict southward permafrost thawing will occur at a rapid rate. Thawed permafrost could release 1.7 trillion tons of carbon into the atmosphere<sup>45</sup> (two and a half times as much carbon as is currently in the entire atmosphere) causing another positive feedback loop to accelerate temperature rise.

Recent evidence<sup>46</sup> shows that the Arctic’s oscillating Polar Vortex winds that normally trap cold air in the Arctic are being disrupted by Arctic warming. Cold Arctic air and extreme winter weather are shifting southward into North America, Europe and Asia due to warmer Arctic temperatures.

Because of melting ice, the Arctic’s vast untapped resources are becoming recoverable while its use as a passage

for trade and military movement is becoming a reality. The Arctic holds 22% of the world's undiscovered fossil fuels, including oil and gas.<sup>47</sup> Approximately 84% of these resources are expected to occur offshore, which has created political controversy and international tension over territorial claims.

Melting ice is opening up Arctic sea lanes; Canada's Northwest Passage and Russia's Northern Sea route are already in use. Widespread adoption of these routes could cut down on transportation costs and fuel use.<sup>48</sup> Both developments have strategic global implications that demand U.S. attention.

The melt in the north has been accompanied by a strategic decision by some Arctic nations to re-militarize their Arctic frontiers. Partly, this is recognition that, with the harsh conditions that energy exploration and freight shippers will face, only the military is capable of providing the search and rescue capability necessary to respond to crises. On the other hand, countries like Russia and Canada have engaged in military brinkmanship over areas of contested sovereignty.

Ultimately, the trend among Arctic nations appears to be towards cooperation. It is noteworthy that the Arctic Council, a forum of Arctic nations, signed a joint search-and-rescue agreement as their first treaty in May 2011.<sup>49</sup> However, with new players like China and the European Union looking to be involved in this area, there is the potential for conflicts over resources and access.



*The submarine USS Pogy surfaces through Arctic ice*

## Other Areas

This chapter has focused on certain ‘hot zones’ that security planners should focus on. These are areas that exist at the intersection of instability, America’s national interests, and vulnerability to climate change. Although the U.S. is a global superpower with forward deployed military and diplomatic personnel in every corner of the world, planners cannot focus on preparing for every eventuality.

Allies like Japan, European countries, or Australia will undoubtedly be affected by climate change. However, it is beyond the scope of this paper to discuss specific impacts because they are unlikely to harm America’s national security or global stability over the medium term; there is no foreseeable scenario in which American troops are deployed in response to a drought in Australia or a flood in France, for instance.

Over the medium to long term, the worry for American planners should be that the combination of an ongoing fiscal crisis, decades of reduced military budgets, and reduced capacity due to domestic impacts of climate change will sap the ability of allied European or Asian nations to work alongside American military and diplomatic assets in response to security crises of all sorts – whether caused by climate change or not.

An important caveat to this should be Southeastern Europe, including the Balkans and Greece. This region has a climate that is more akin to the northern Middle East (especially Turkey, Syria, and Lebanon) than the rest of Europe. Greece has also suffered through a long economic recession, while the countries in the Balkans like Kosovo or Bosnia would not exist without economic and security support from outside powers like NATO and the European Union. Like in the Middle East, control of water resources is a source of power, and changes in those water resources could provoke conflict among ethnic and religious communities; a conflict that still only lies just beneath the surface.

On the other hand, Central Asia, to include the former Soviet Republics of Central Asia, was not included as a ‘hot zone’ in this report because America has limited influence in the region. The use and control of water resources have been a consistent source of strain between upstream and downstream countries like Tajikistan and Uzbekistan, and climate change flows from the glaciers that feed the transboundary rivers of the region.<sup>50</sup>

### Special Cases: Russia and China

Both China and Russia are not covered as climate security ‘hot zones’ by this report because there is very little likelihood that American national security assets will have to respond to climate-related events in either of these countries. That does not mean that climate change does not threaten these countries’ domestic security, or their citizen’s personal security; as briefly detailed below, it clearly does. However, America’s military planners should not plan for addressing the security-related impacts of climate change within either country over the medium term; just as the Pentagon would not expect the Chinese People’s Liberation Army to be preparing to respond to a drought in the American Midwest or for the Russian Fleet to support a humanitarian response to a hurricane in New Orleans.

#### Russia

Russia’s large landmass, stretching from the plains of Europe across Siberia to the Northwestern Pacific, is a generally continental climate that features bitter cold winters and short, hot summers. For many years, Russia was identified – not least by its own policymakers – as one of the few winners from climate change.<sup>51</sup> It was thought that a longer growing season would help food production, milder winters would reduce heating

needs, and ice melt in the Arctic would open new areas to fossil fuel exploration.

The heat wave of the summer of 2010 changed that calculus. July 2010 featured extended temperatures higher than at any time in the historical and archeological record. Thousands of people were killed by wildfire, pollution, and – in a purely Russian twist – drowning from swimming after drinking too much vodka.<sup>52</sup> After more than two months of unremitting temperatures well above average, wildfires raged across seven Russian regions, causing an estimated \$15 billion in damages.

Although originally a domestic issue, the Russian heatwave and drought caused a transnational food security crisis. The drought itself destroyed 30 million tons of grain, cutting the harvest by a third.<sup>53</sup> This loss was compounded on world markets when the Russian government banned all grain exports in an effort to keep domestic food prices low. This spurred a food price increase in late 2010 that saw prices rise by over 40% in less than a year. The impact this price rise had on food importing nations in the Middle East and North Africa is detailed in the section “The Arab Spring and World Food Prices.”

## China

China is a large country that defies generalizations about its climate. It stretches from tropical in the South, mountainous in Tibet, cold and dry in Manchuria, and a high desert inland. The one common factor in this variety is that the rapid economic growth of the country over the last thirty years is combining with a changing climate to dramatically alter China’s diverse landscapes.

China’s government, including its Armed Forces, after years of skepticism, now sees that climate change threatens China’s national security. They believe it will cause an increase in the frequency of extreme weather events will undermine water security in areas already suffering from endemic overuse of water, and may increase tensions around its borders.<sup>54</sup> This threatens the quality of life of China’s citizens.

China’s ruling Communist party has become acutely sensitive to social unrest caused by the externalities of economic growth – like pollution – and is prioritizing efforts to mitigate the security impacts of climate change on China. One of the most controversial and ambitious projects to mitigate these impacts is the “South-North Water Transfer Project,” a \$62 billion effort to divert over 40 billion cubic meters of water per year from the Yangtze River in the south to the dry regions along the Yellow River and north to Beijing.

China’s seaside megacities like Shanghai, Hong Kong, Guangzhou, Shenzhen, Hangzhou, Tianjin, Dongguan, and Shantou – all of which have more than 7 million people – share the vulnerabilities of other Asian megacities listed in the “East Asia and the Pacific” section: they feature low lying infrastructure that is vulnerable to flooding, a gradual subsidization (sinking) of the land due to increasing urbanization, and they lie in the direct path of extreme weather events, like typhoons.

*“The ice caps are melting. Seas are rising. Deserts are spreading. Storms are more frequent, more violent and more destructive. And pollution, famine and natural disasters are killing millions of people every year. These are changes that many experts thought were still years down the line, but climate change is radically altering our planet at a rate much faster than even the pessimists expected.”*

**Senator John Kerry**  
ASP Board Member

## **Summation**

Climate change will impact every country and every society around the world.

No report could detail every possible interaction between the impacts of climate change, physical factors like water and food availability and social factors like governance and corruption.

Climate change will act as an accelerant of instability in all of these areas, and more.

One of the important lessons security planners should expect from a changing climate is to plan for the unexpected.

Resilience and an ability to adapt will be the key methods for preventing the real impacts of climate change from causing a collapse in security.

However, planners should expect that, in a globally interconnected world, the impacts of climate change on one area will have spillover effects on other, unknown areas elsewhere.

Furthermore, American security planners should not think that this is simply a problem that will affect the rest of the world.

In the next chapter, we discuss how climate change will harm the security of the American Homeland.

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