

Climate Change and the Threats to the American Midwest

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# Climate Change and the Threats to the American Midwest



American Security Project

## Briefing Paper

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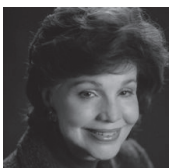
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# Climate Change and the Threats to the American Midwest

The climate is changing – the shift in global temperatures and their impacts on weather patterns is scientifically proven, though the extent of future change is subject to uncertainty about future emissions and the sensitivity of the system to increasing concentrations of emissions.

Climate change presents threats to national security because it is a “threat multiplier” or an “accelerant of instability” – it influences a range of other, already existing threats. For example, a food shortage exacerbated by increased temperatures and population could lead to conflicts over resources, which may drive human migration to a more resource-rich area. This may increase stress on food and water resources in that region, beginning the process again.

Climate change is real and happening now – and it is not just a threat to stability around the world – it threatens America’s homeland security as well. American policymakers often overlook that the U.S. should lead in climate change adaptation and mitigation because the homeland is directly threatened by climate change. Climate change will harm America’s infrastructure, agriculture, economy and population; these directly affect America’s homeland and the security of its citizens.



## The Climate of the Midwest

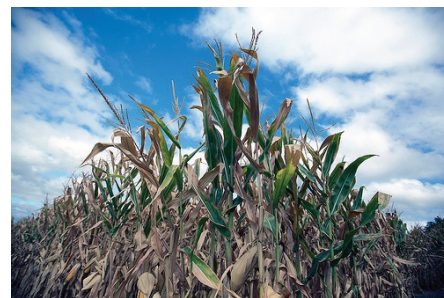
For the purposes of this report, the Midwest reaches from Missouri in the southwest to Ohio in the east, Minnesota in north and Michigan in the West. Iowa, Wisconsin, and Indiana round out the states. This is America’s industrial and agricultural heartland.

The region is home to 66 million people. Its climate is marked by hot, humid summers and very cold winters, though the coldest periods of winter have become less frequent over the past few decades, as snow and ice arrive later in the fall and melt earlier in the springtime. However, extreme winter weather is still possible, and even common, due to the continental climate system and the periodic influences of cold Arctic air. Predictions for future climate are uncertain, given average temperatures could increase up to 3°F in the next few decades and may increase up to 10°F (5.6°C) by the end of the century.<sup>1</sup>

## Agriculture

In the next few years, agriculture in parts of the Midwest could benefit slightly from warming temperatures in the region resulting in longer growing seasons. However, these benefits will be counteracted by extreme weather events.

More frequent heat waves, floods, and droughts, as well as larger populations of harmful insects, will likely place additional stress on the region's agricultural production.



This presents a paradox: in good years, there is a chance of a bumper crop, but in bad years, agriculture could be significantly harmed. This is evident from two recent years: in 2013 – a good year for growth – Iowa produced 2.2 billion bushels of corn, while in 2012 – a year featuring extreme heat and drought – Iowa produced only 1.88 billion bushels of corn on the same amount of land.<sup>2</sup>

These extreme events, compounded with other factors from climate change, like water availability, will result in serious challenges for farmers.

## Risks to the Great Lakes

The surface water temperature of the Great Lakes has also been steadily increasing, impacting the timing and extent of ice cover and the availability of dissolved oxygen. This will upset ecosystems and the fisheries that rely on them.

Increased temperature may cause an increase of harmful algae blooms that place native fish populations at risk. Changes in the Great Lakes' water levels will have a large impact on coastal features such as beaches and dunes, and will create vulnerabilities for coastal ecosystems, infrastructure, and communities.<sup>3</sup>



## Extreme Rainfall

More frequent heavy downpours will strain drainage and wastewater systems unless they are rebuilt during the next century. Flooding along the region's major rivers, including the Mississippi River, has serious consequences for waterfront communities and on transportation as many levees in the region are in poor condition.<sup>4</sup>

Between heavy rainfall events, there will likely be longer periods without precipitation. Increased evaporation during warmer summers could increase the likelihood of water shortages or drought.



## Public Health

Greater frequency of heat waves, decreased air quality, and greater risk of waterborne disease, especially given the aging municipal water systems in the region, are of concern for the public health of the people in the region. For example, climate change could increase heat-related deaths, increase the risks of spreading certain diseases, and worsen air quality.<sup>5</sup>

If greenhouse gas emissions increase at a higher rate, the average annual number of heat-related deaths in Chicago is projected to quadruple by the middle of century.<sup>6</sup> Ticks and mosquitoes will survive in greater numbers as winters become milder, increasing the risks of spreading diseases such as Lyme disease and West Nile virus.

## Building a 21st Century Vision of Sustainable Security in the Midwest

While the impacts of climate change on the Midwest could be acute, and the threats are high, the opportunities are also great.

With world-class businesses, educational institutions, and the world's most efficient farmers, the region has an opportunity to build an economy that is resilient to changes. With institutions like Argonne National Laboratory and universities, both public and private, working on building new, carbon-free energy systems, there is a growing base that will be able to reduce the emissions causing climate change.

The private sector is increasingly investing in clean energy, ranging from Advanced Biofuels facilities, like POET-DSM's Project LIBERTY in Emmetsburg, Iowa, to wind farms across the region; from research on cutting edge batteries to auto manufacturers across the region building more cleaner, more fuel efficient vehicles.



It is important to note that those who present addressing climate change as only a cost to business are presenting a false choice. With proper risk analysis and management, we can address the challenges of climate change – and no one knows that better than the military.

We can increase mission effectiveness and reduce the footprint at the same time: the Midwest can help lead the way.

[www.NationalSecurityandClimateChange.org](http://www.NationalSecurityandClimateChange.org)

Endnotes

1. "Midwest Impacts & Adaptation." US Environmental Protection Agency. <http://www.epa.gov/climatechange/impacts-adaptation/midwest.html> (accessed October 10, 2014).
2. "Frequently Asked Questions, Iowa's Corn Production" Iowa Corn Board, [http://www.iowacorn.org/en/corn\\_use\\_education/faq/](http://www.iowacorn.org/en/corn_use_education/faq/) (accessed October 10, 2014).
3. Julie A. Winkler, Jeffrey A. Andresen, Jerry L. Hatfield, David Bidwell, and Daniel Brown, "Climate Change in the Midwest: A Synthesis Report for the National Climate Assessment" <http://glisa.umich.edu/news/climate-change-midwest-synthesis-report-national-climate-assessment> (accessed October 10, 2014).
4. *ibid.*
5. Jacob, D. J., and D. A. Winner, 2009: Effect of climate change on air quality. *Atmospheric Environment*, 43, 51-63, doi:10.1016/j.atmosenv.2008.09.051 <http://www.sciencedirect.com/science/article/pii/S1352231008008571> (accessed October 10, 2014).
6. "Midwest Impacts & Adaptation." US Environmental Protection Agency. <http://www.epa.gov/climatechange/impacts-adaptation/midwest.html> (accessed October 10, 2014).

The American Security Project (ASP) is a nonpartisan organization created to educate the American public and the world about the changing nature of national security in the 21st Century.

Gone are the days when a nation's security could be measured by bombers and battleships. Security in this new era requires harnessing all of America's strengths: the force of our diplomacy; the might of our military; the vigor and competitiveness of our economy; and the power of our ideals.

We believe that America must lead in the pursuit of our common goals and shared security. We must confront international challenges with our partners and with all the tools at our disposal and address emerging problems before they become security crises. And to do this we must forge a bipartisan consensus here at home.

ASP brings together prominent American business leaders, former members of Congress, retired military flag officers, and prominent former government officials. ASP conducts research on a broad range of issues and engages and empowers the American public by taking its findings directly to them via events, traditional & new media, meetings, and publications.

We live in a time when the threats to our security are as complex and diverse as terrorism, nuclear proliferation, climate change, energy challenges, and our economic wellbeing. Partisan bickering and age old solutions simply won't solve our problems. America – and the world - needs an honest dialogue about security that is as robust as it is realistic.

ASP exists to promote that dialogue, to forge that consensus, and to spur constructive action so that America meets the challenges to its security while seizing the opportunities that abound.



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