

# Issue Brief: The Impacts of Climate Change

*An Analysis of How Climate Change can Make or Break Our Great Nation and How We Can Influence It- By Shannon Kaminski*

The United States of America is a world leader because of its updated urbanization, its great influence, and its tendency to remain number one in innovative technologies and breakthroughs. As the US remains on top in CO2 emissions internationally, why is it moving backwards in sustainability? This issue brief intends to explore the impacts of climate change and establishes a course of action with sustainable and alternative energies that will keep the United States on top. The slow heating process of climate change is not as worrisome as the extreme weather conditions it sparks, and the instability that our great country risks from these effects.

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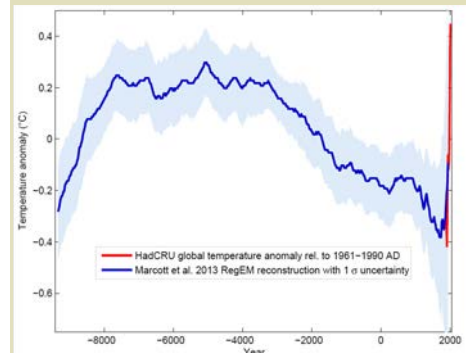
## I. Overview

Climate Change has emerged as a growing point of significance in America, as well as the world. Its significance, and even its legitimacy is questioned by many, and has recently, under change of federal power been completely discredited. In order to appeal to the US Congress and policymakers, this issue brief will first prove the existence of Climate Change, with real facts, and discredit the myths. Extreme weather and rising water levels are the two main points of discussion to have a thorough understanding.

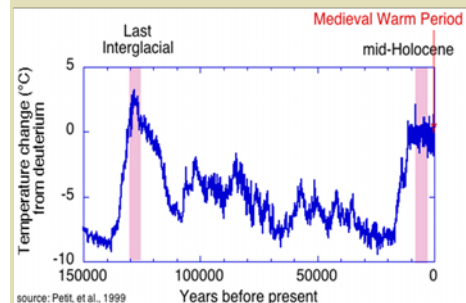
### Extreme Weather

A most common misconception of Climate Change is the simple assumption that the Earth is getting warmer and is heating at a very fast rate. The Earth has a natural global warming cycle that oscillates up and down for

The Earth's  
natural heat cycle

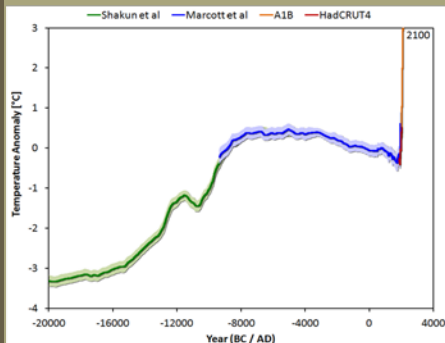


Above shows the Earth's latest  
heat cycle (warm) in the last 8,000  
years.

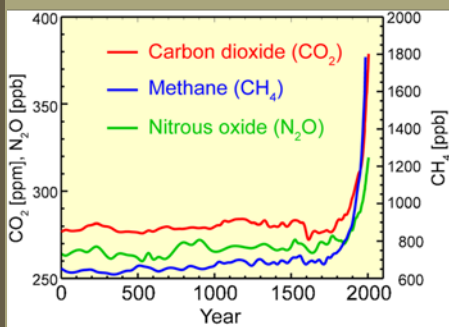


Above shows the oscillation in the  
last 150,000 years.

## Global Warming Visuals



Above: Global Warming since last Ice Age (20,000 years)



Above: Atmospheric Composition Changes (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O) from 2000 years ago to now.

different causes, and over a factor of hundreds of thousands of years<sup>i</sup>. In other words, the Earth naturally has a cycle of warm years, and cool years, where the graph of the average temperatures over thousands of years will steadily move up and down. This cycle identifies as the Holocene<sup>ii</sup>. The graph in the sidebar shows a reconstruction of warming since the last Ice Age, which peaked 20 thousand years ago. Notice how the end of it, leading to 2100, shows an extreme standard deviation from the intended Holocene cycle, where the graph tips up in an extremely unnatural curve.

*"We are catapulting ourselves way out of the Holocene."*

Marcott et al<sup>iii</sup>, a leading Earth Scientist specializing in research in glacial geology, paleoclimatology, and geochemistry, dryly stated the way in which humanity's tendencies are making dramatic changes on our Earth.

This graph directly shows that the increase in greenhouse gases caused by humans have deviated Earth from its natural, slow cooling cycle. The second graph in the sidebar shows the changing atmospheric composition. Undeniable, is the steep increase in greenhouse gases carbon dioxide, methane, and nitrous oxide.

So what does this mean for us? How does leading our Earth's cycle out of its natural Holocene affect us?

Having an abundance in warm days results in more frequency of extreme weather conditions that are considered a rarity<sup>iv</sup>. Extreme weather can have many contributing factors, but human cause is a main factor. Computer models of the climate that include both natural forces as well as human influences are consistent with observed global trends in heat waves, warm days and nights, and frost days over the last four decades<sup>v</sup>. We know that heat related extremities are on the rise, like the killer European heat wave of 2003, and the Russian heat wave of 2010. We know there has been an increase of precipitation, both rain and snow. We know that heat waves are longer and stronger

than they used to be; we know that there are more, longer lasting droughts, and the bottom line is, all of these effects are directly relative to human cause<sup>vi</sup>.

So, contrary to the belief that the only effect of global warming is, well, global warming, there are many more effects than that—including weather that may just act as a punishment on humans for ill treatment of our mother Earth. We will revisit extreme weather later in the issue brief to discuss what it means for our nation.

## Rising Water Levels

Rising water levels are another pressing effect that has resulted from climate change. Warmer averages in temperature, and deviating conditions from the Earth's normal cycle cause ice caps that have been around for thousands of years to break down and melt. This process builds up sea levels and has an impending risk on America's most beloved coasts and most strategic military water bases.

According to NASA's climate research, every decade, the amount of Arctic ice decreases by 13.3%<sup>vii</sup>. On the right, see the satellite observations that show the dramatic change of Arctic Ice levels—2012 holds the lowest amount on record. Satellite data shows that Earth's polar ice sheets are decreasing by 281.0 gigatonnes per year. Related to Arctic Ice amounts diminishing are rising sea levels, which, according to NASA, have risen over 7 inches in the past 100 years, and are rising by 3.4 milliliters per year<sup>viii</sup>. These levels are the result of two factors: melting ice caps and the expansion of water as it warms.

Rising sea levels are extremely heinous for experts to accurately measure—the amount of resources that are available today have greater abilities to come closer to accurately representing just how fast future sea levels will rise. But a lot more than a computer equation or satellite observations go into the process because if Greenland and Antarctica rapid ice flows are taken into account—which together have enough ice to raise sea levels by 65%, most projections of sea levels are very conservative, as they only take all the world's mountain glaciers into account<sup>ix</sup>. Predicting the future is very problematic, but Steve Nerem at University of Colorado says,

## Annual Arctic Ice Minimum Level Changes



Above: 1978

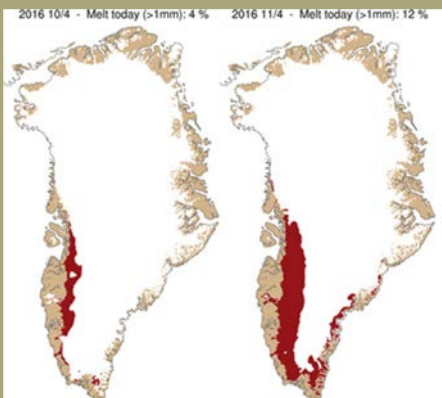
Below: 2012



## Ice Shelves are becoming increasingly unstable.



Above shows unstable ice caps in Greenland.



Above is an illustration of rapid expansion of ice melt on Greenland over only 2 days in April 2016.

*"We all think we're committed to a meter of sea level rise. We just don't know exactly how quickly."*

Scientists can all at least agree on this, however as years progress, and the warm spring sun melts the bottle cap that keeps the bottle of water from seeping into the ocean uncontrollably, estimates of sea levels in the future are rapidly rising. "When the Intergovernmental Panel on Climate Change (IPCC) put out its last report in 2013, the consensus was for under a meter (3.3 feet) of sea level rise by 2100. In just the last few years, at least one modeling study suggests we might need to double that<sup>x</sup>."

Why should rising sea levels matter? Because some of our country's strongest economic and military places are on the coast or in the middle of the ocean.

Despite scientists' lack of confidence in projections of future sea levels, it has been made clear by dramatically rapid ice melts in Greenland and the Arctic (see second image in side bar) that ice could melt slowly over centuries to come, or they could drastically plummet in a matter of just 50 to 100 years<sup>xi</sup>.

## II. Effects on America

The scientific aspect of this issue brief has established the very real effect of humans on climate change, and in turn, the warming and deviation from the Earth's natural cycle, as well as melting of significant ice caps and shelves, we will turn our focus to how these changes will play a role in our great nation's future. This issue brief will focus on national instability, including military and economic instability.

## National Instability

First, we proved how climate change warms the Earth and increases the amount of extreme weather that occurs. The term extreme weather refers to any weather that is not normal—in other words, weather that is rare. This could be anything from 70-degree days in the middle of February, to hurricanes and irregularly big storms.

The warm days in February may not cause national instability; however, big storms and hurricanes increase economic stresses and put resources at risk of scarcity of water and food production.

Evidence by example is the best way to describe this scenario. The first example goes back to Hurricane Katrina. A hurricane and subsequent flood that goes down in US history as the most destructive storm of all time. The costs of damage cost over \$96 billion<sup>xii</sup>, and insurance covered over \$80 billion of the losses. It left 118 million cubic yards of debris in its wake—cleanup efforts were a completely new project in themselves. A huge setback to federal costs and another setback to the infrastructure of New Orleans. It caused an evacuation of 75% of the Gulf's 819 manned oil platforms, which reduced America's oil production by a third<sup>xiii</sup>. University of North Texas Professor Bernard Weinstein estimated that Katrina cost \$250 billion.

A similar example is the awesome tsunami and earthquake that hit Japan in 2011, costing \$300 billion in damage, and having lasting effects on infrastructure, namely the Fukushima Nuclear Power Plant, which began leaking radioactive material into surrounding waters, and suffered a Level 7 nuclear meltdown after the tsunami struck<sup>xiv</sup>.

Additionally, the earthquake in Haiti in January 2012 left 1.5 billion people homeless, 220,000 people dead, and a devastating lack of resources like water and food<sup>xv</sup>.

## Devastating Effects of Storms

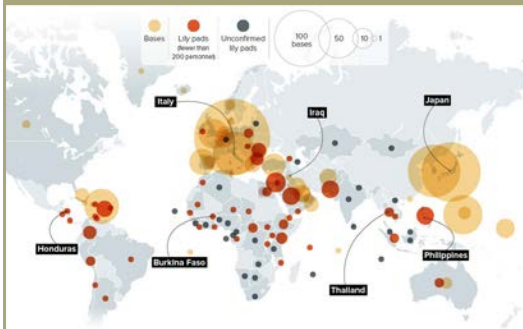


Above shows the floods in Hurricane Katrina's wake. ([www.climatecentral.org](http://www.climatecentral.org))



Above shows Japan's tsunami effects, including the sludge and fires that broke out.





US international military bases around the world.

No, natural storms cannot be prevented; however warmer weather leaves more moisture in the air, a main proponent in the formation of storms. So, with increasingly warm weather within our climate, it is only natural that an increasing amount of extreme storms begin to occur. Since 1980, risk of economic loss due to floods has increased by over 160 percent and to tropical cyclones by 265 per cent in OECD countries. In fact, risk of economic loss due to floods and cyclones in the OECD is growing faster than GDP per capita<sup>xvi</sup>.

For the wellbeing of our country's economy alone, it is clear a change has to be made.

Additionally, rising sea levels pose a huge threat as it exacerbates erosion, and leads to loss of land and coastal industries<sup>xvii</sup>. More importantly, the US military and coast guard is at an alarming risk with rising sea levels. Over 300 coast guard bases rest on domestic coastal territories, another 200+ military bases of the US navy, air force, army, and marine corps that are located overseas are at risk of being nonexistent within our lifetimes!

Climate change isn't just about respecting our planet anymore. It's about protecting our country from extreme conditions and rising sea levels that have the potential to utterly destroy our socio-economic and militant stability. Our great nation is at risk of being swept from number one in the world as it refuses to accept climate change as a reality. For this reason, the following solutions should be implemented

immediately, for the lasting longevity and prosperity of the United States of America.

### III. The Solutions

The United States' newly inaugurated federal government has put the focus of climate change in the back seat, eliminated the EPA from the official website of the White House, and attempting to undo Obama's Clean Power Plan—a plan that regulates America's greenhouse gas emissions. It is the administration's legal duty to regulate climate-causing emissions<sup>xviii</sup>. Furthermore, if America expects to remain on top internationally, it needs to implement a plan to become sustainably independent.

#### Focus On Sustainability

One of the most important actions that the federal government must take is to put its main focus on sustainability.

The current policy makers have put sustainability plans in the back seat, in order to make creating jobs the main priority, however, if policy makers incorporated sustainability into its plans, even more, lasting jobs could be created. Implementing solar and wind energies, and continuing alternative energy research, would be able to increase jobs, and it would also help our society become more intelligent, while deeply helping the environment and economy.

The main goal should be to get our country to be 100% independent in sustainability.

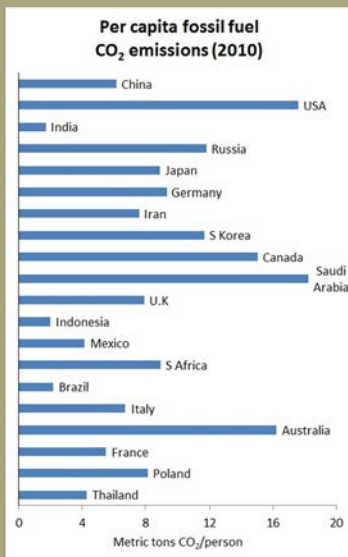
Denmark has plans to be 100% sustainable by 2050<sup>xix</sup>, and it's already producing too much

#### Sustainable Management Jobs- Average Salaries



This info graph shows the opportunities available now to management positions surrounding sustainability, an industry that will grow substantially in the future.





The US is leading in fossil fuel emissions, and it must make a change immediately.

energy for itself, so it actually sends the surplus back into the grid and makes money from surrounding countries.

Copenhagen is the world's first carbon neutral capital, as 40% of its population bicycles to work. It is also the world-leader in wind-turbine technologies. The US should use Denmark's plans to work towards an independently sustainable country.

If America could be completely independent from offshore resources, could you imagine how easily its economy would flourish?

## Work Closely with Scientists

Bill Nye, a noteworthy scientist, known for his Grammy-Award winning show "Bill Nye the Science Guy" stated that "You can't tie any one event to the overall changing of the world's climate, but these are absolutely consistent with the mathematical models of the Earth's atmosphere," and that it's up to the next generation to rise up and come up with the solutions.

The US government needs to spend time with leading scientists in the field that have data and research already completed on the best ways to reduce CO<sub>2</sub> emissions, and the most effective new forms of energy.

The Environmental Protection Agency (EPA)<sup>xx</sup> is taking several steps towards a healthier Earth, including partnering with organizations and other countries to reduce greenhouse gas emissions, cut wasted energy, and saving money. Collecting data and evaluating policy are more actions that make a huge difference.

Alternatively, U.S. Global Change Research Program<sup>xxi</sup> is getting the country ready to adapt to the change of our environment, and aims to facilitate engagement between scientists and decision makers—a vital step in connecting the science behind the regulations. It also guides and coordinates scientific efforts and provides access to relevant research. Policy makers must gain this information in order to make intelligent decisions about how to approach the complex issue of climate change.

## Re-evaluate the Clean Power Plan

The Clean Power Plan is a historical rule meant to decrease the carbon footprint of power plants.

*“With strong but achievable standards for power plants, and customized goals for states to cut the carbon pollution that is driving climate change, the Clean Power Plan provides national consistency, accountability and a level playing field while reflecting each state’s energy mix. It also shows the world that the United States is committed to leading global efforts to address climate change<sup>xxii</sup>.”*

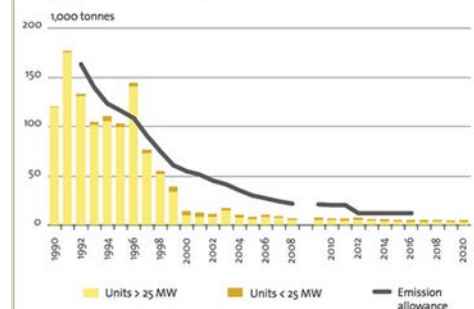
In January 2017, the US denied reconsideration and Administrative Stay of the Clean Power Plan, because it lacked legal regulations to be reconsidered. This has set the US back in gaining momentum to a sustainable society, and it is vital for our policy makers to update its status and pass a newly revised Clean Power Plan rule that has stricter guidelines, by lowering carbon pollution standards, and focuses on adding a required amount of solar/wind power facilities by a 2021. Also, minimizing the amount of cars powered by gas in order to help reduce greenhouse emissions, aside from regulating big power plants. This plan will be similar to that of Denmark’s sustainability plan, and it will make a huge difference in our society.

## Conclusion

Following this plan will move America ahead of other countries in sustainability and keep it at the top,

## Denmark’s Decreasing Emissions from 1990-2020

Figure 9 SO<sub>2</sub> emissions from electricity and CHP generation in Denmark.



setting precedents for other countries to follow. It will also protect some of our biggest assets, including military and food/water resources, as well as economic stability. Setting sustainability as a priority and using it in tangency with creating new jobs will increase the intelligence of our society and reduce the amount of jobs that require college degrees, while increasing job opportunity in an industry that is exponentially growing. Getting decision makers to work more closely with scientists will give decision makers the extra edge that they need to make insightful policies that will make significant differences in helping the environment. Finally, reediting and reevaluating the Clean Power Plan to make it more up-to-date, more strictly regulated, and more closely related to Denmark's Clean Energy Plan will spark America's return to number one in sustainability, and set a precedent for the rest of the world to do the same.

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