

## Banner Links

### Great Acceleration

The huge increase in the burning of fossil fuels is only one major environmental impact.

According to the International Geosphere-Biosphere Programme, the earth is currently undergoing something called The Great Acceleration which recognizes that many human activities reached take-off points sometime in the 20th Century and sharply accelerated towards the end of the century. The last 60 years have without doubt seen the most profound transformation of the human relationship with the natural world in the history of humankind.”

<http://www.igbp.net/globalchange/greatacceleration.4.1b8ae20512db692f2a680001630.html>

### Climate Danger: Political Instability

Global conflicts and wars are likely to increase because of declining amounts of land, water, and food. At the Global Security Forum in 2015, John Brennan (former Director of the CIA) linked climate change with political unrest. He explained: “Of the most immediate concern, sharply reduced crop yields in multiple places simultaneously could trigger a shock in food prices with devastating political effect, especially in already-fragile regions such as Africa, the Middle East and South Asia.”

<http://www.nationalobserver.com/2015/11/17/news/climate-change-drives-political-instability-ciadirector>

### Climate Danger: Tipping Points

Tipping points are the threshold at which the amount of greenhouse gases emitted triggers a feedback loop that in turn releases even more greenhouse gas. Example: Permafrost is a frozen layer of soil that contains frozen carbon. As temperatures increase, the permafrost melts and releases the huge amount carbon dioxide or methane, which warm up the Earth even more.

<https://insideclimatenews.org/news/10042017/permafrost-climate-change-arctic-carbon-release>

### Climate Danger: Extreme Weather

In general, higher global temperatures mean stronger storms, more precipitation, and higher sea levels will exacerbate storm surges. Hurricane Harvey benefited from unusually toasty waters in the Gulf of Mexico. As the storm roared toward Houston in August 2017, sea-surface waters near Texas rose to between 2.7 and 7.2 degrees Fahrenheit above average. These waters were some of the hottest spots of ocean surface in the world. The tropical storm, feeding off this unusual warmth, was able to progress from a tropical depression to a category-four hurricane in roughly 48 hours.

<https://www.theatlantic.com/science/archive/2017/08/did-climate-change-intensify-hurricane-harvey/538158/>

### Climate Danger: Extinction

More frequent and intense drought, storms, heat waves, rising sea levels, melting glaciers and warming oceans can all harm animals and plants. Climate change destroys wildlife habitats, food sources, and environmental cues. According to the center of Biological Diversity the earth is currently experiencing the worst spate of species die-offs since the loss of the dinosaurs 65 million years ago. The center also predicts 30 to 50 percent of all species are heading toward extinction by mid-century. These ecosystems are so delicately balanced and interconnected that the extinction of one species can seriously affect another. <https://www.worldwildlife.org/threats/effects-of-climate-change>

### Climate Danger: Heat

Higher temperatures can reduce crop yields and drive up energy usage, and heat waves are the No. 1 weather-related killer in the U.S. For example, more than 3,000 New Yorkers could die each year from increased heat in 2070 up from 300 in 2006. People in South Asia, where one-fifth of the world's people live, could face summer heat waves that are impossible to survive without protection. These are also among the poorest regions in South Asia. Many are dependent on subsistence farming that requires long hours of hard outdoor labor.

<http://news.nationalgeographic.com/2017/08/south-asia-heat-waves-temperature-rise-global-warming-climate-change/>

(<http://www.climatecentral.org/news/climate-change-is-increasing-extreme-heat-globally-17120>).

### Climate Danger: Sea Level Rise

One of the most dire impacts of anthropogenic climate change is a rise in the global sea level caused by the melting of glaciers and land-based ice caps, as well as a smaller increase from expansion due to the higher temperature of the water itself. Some locations experience greater rise than others because of local terrain, local hydrological factors, and oceanic currents, among other regional factors. Unfortunately, many large cities are located on coastlines that are particularly vulnerable to sea level rises. As seawater reaches farther inland, it can cause destructive erosion, wetland flooding, aquifer and agricultural soil contamination, and lost habitat for fish, birds, and plants.

<http://www.nationalgeographic.com/environment/global-warming/sea-level-rise/>

<http://climate.org/sea-level-rise-risk-and-resilience-in-coastal-cities/>

### Climate Danger: Food supply

Climate change, and its impacts on extreme weather and temperature swings, is projected to reduce global production of corn, wheat, rice and soybeans by 23 percent in the 2050s.

Across Africa, yields from rain-fed agriculture could decline by as much as 50% by 2020. Likewise, 1 degree Celsius of ocean warming could cause fish to grow as much as 30 percent smaller; a change of 2 degrees C could make them 45 percent smaller. Big, active fish like tuna could see even greater effects, according to the study.

[https://www.scientificamerican.com/article/warming-waters-could-mean-smaller-fish/?utm\\_source=twitter&utm\\_medium=social&utm\\_campaign=sa-editorial-social&utm\\_content&utm\\_term&sf109457540=1](https://www.scientificamerican.com/article/warming-waters-could-mean-smaller-fish/?utm_source=twitter&utm_medium=social&utm_campaign=sa-editorial-social&utm_content&utm_term&sf109457540=1)

<http://www.dailyclimate.org/tdc-newsroom/2017/may/climate-change-could-cut-into-major-crop>

<http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-chapter5.pdf>

<https://insideclimatenews.org/news/21082017/rising-temperature-agriculture-crop-yields-climate-change-impact>

### **Climate Danger: Amazon Forest Dieback**

The Amazon removes billions of tonnes of carbon dioxide from the atmosphere each year, but is now struggling to do so because of deforestation and climate change induced droughts. As temperatures rise, the forest that was once a major carbon sink is becoming a major producer.

[http://wwf.panda.org/what\\_we\\_do/where\\_we\\_work/amazon/amazon\\_threats/climate\\_change\\_amazon/](http://wwf.panda.org/what_we_do/where_we_work/amazon/amazon_threats/climate_change_amazon/)

### **Climate Danger: Boreal Forest Fires**

As a direct result of global increase in temperature, Boreal forest fires in North America and Eurasia are burning longer and hotter. *In California the forest fire season has increased by more than two months since 1970; making it now seven months long.* According to Ralph Kahn at NASA: "Boreal forests store about 30 percent of the world's carbon. When they burn, they put that carbon in the atmosphere, creating a vicious cycle that will likely lead to more fires."

<http://www.cbc.ca/news/technology/boreal-forest-being-driven-to-tipping-point-by-climatechange-study-finds-1.3198892>

<http://globalforestatlas.yale.edu/climate-change/climate-change-boreal-forests>

### **Climate Danger: Arctic Collapse**

Ice in the Arctic plays a huge role in regulating the climate. It reflects sunlight back into space, which cools itself and sends cold air and water currents down over the rest of the planet. Global warming is causing Arctic ice to melt which is having a significant impact on global weather

patterns. [http://e360.yale.edu/features/as\\_arctic\\_ocean\\_ice\\_disappears\\_global\\_climate\\_impacts\\_intensify\\_wadhams](http://e360.yale.edu/features/as_arctic_ocean_ice_disappears_global_climate_impacts_intensify_wadhams)

### **Climate Danger: Public Health**

According to the Center for Disease Control, changes in disease vectors, malnutrition, heat related illness, and mental health impacts are just a few of the ways climate change will affect human health around the world. A recent study estimates climate change kills 1,000 children every day and 400,000 people a year. <http://daraint.org/wp-content/uploads/2012/09/CVM2ndEd-FrontMatter.pdf>

### **Climate Danger: Ocean Acidification**

Earth's oceans have been absorbing carbon dioxide emissions. According to National Geographic: "When carbon dioxide dissolves in the ocean, carbonic acid is formed. This leads to higher acidity, mainly near the surface, which has been proven to inhibit shell growth in marine animals like clams, lobster, krill, and oysters. ....Greenhouse gas emissions have already raised the pH by 30 % and the oceans will be 150% more acidic by the end of the

century. <http://www.nationalgeographic.com/environment/oceans/critical-issues-ocean-acidification/>

#####

### **Climate Impact: Syria**

Climate change helped spark the violence in Syria. Just before the war began, the most severe drought on record drove up food prices and forced 1.5 million rural residents into Syria's already-packed cities--- just as the country was also accepting immigrants fleeing from the Iraq war. <http://news.nationalgeographic.com/news/2015/03/150302-syria-war-climate-change-drought/>

### **Climate Impact: India**

Throughout the last decade, climate change has caused severe droughts in once fertile parts of India. Soaring temperatures have gripped parts of southern and northern India in an extreme heat wave which has killed more than 500 people, with the government at times advising people not to go to work between 10 a.m. to 4 p.m. The hottest place in India in one recent heat wave was Allahabad, a city in the northern state of Uttar Pradesh, which saw mercury rise to 47.7 degrees Celsius (117.8 Fahrenheit) while the capital Delhi recorded a high of 43.5C (110.3F).

<https://www.theguardian.com/environment/2017/jul/31/suicides-of-nearly-60000-indian-farmerslinked-to-climate-change-study-claims>

### **Climate Impact: Burundi**

Hunger caused by climate change in Africa is becoming an increasingly dire issue with every passing year. According to Oxfam, 39 million people in Southern Africa do not have enough to eat due to droughts and flooding brought to their nations by the climate-change induced "super" El Niño. Burundi was hit especially hard; this small country was recently rated "hungriest in the world" by Global Citizen. If conditions continue as they are predicted to, many of the people of this area will be forced to migrate or adopt radical new farming practices. Many will likely die before either

happen. <https://www.oxfam.org/en/grow/5-things-you-need-know-about-climate-change-and-hunger>

### **Climate Impact: Peru**

Peru is struggling with the loss of its glaciers. Natural glacial runoff has supplied the nation with water for drinking, agriculture, and hydroelectricity. However, due to climate change, they have been melting at unprecedented rates--- having lost over 40% of the original mass since 1970. Peru's capital Lima, with nine million inhabitants, is the world's second most populous desert city, after Cairo. Even before climate change, it was severely hydrologically challenged and utterly dependent on Andean runoff.

<http://www.perusupportgroup.org.uk/peru-climate-change-water.html>

#### **Climate Impact: The Great Lakes**

Climate change is already apparent in Lake Erie, where algal blooms are now a yearly hazard. Over the last few decades, climate change has caused this region to get more rain and less snow which has increased phosphorus runoff from farms to enter the lakes, and trigger the blooms. According to the National Oceanic and Atmospheric Administration, the blooms will only get worse and that, "future land use and climate change could drastically exacerbate algal blooms." <http://greatlakesecho.org/2017/05/24/the-state-of-the-great-lakes-what-to-expect-from-climatechange/>

#### **Climate Impact: South Africa**

While humans had a huge hand in accelerating climate change, many other species are paying a high price. A recent study suggested that climate change is having major adverse effects on aardvark food sources. Aardvarks all over Southern Africa are starving as their prey dies out in droughts. This is especially troublesome because Aardvarks are what is known as a keystone species. This means that other animals rely on the work they do and it is estimated that 27 animals use aardvark diggings. <https://phys.org/news/2017-07-climate-aardvark-areas.html>

#### **Climate Impact: California**

Devine Simpson of Alameda, California has suffered from severe asthma since she was just three-- and she is not alone. Between 2001 and 2009, the number of patients diagnosed with asthma rose by 4.3 million, according to CDC reports. Recent studies blame this epidemic on climate change. Erratic weather patterns cause plants to release more pollen earlier and longer, making it difficult to breathe. Air pollution from vehicles, worsened by climate change, could also be behind the increasing number of cases in the U.S.

<https://www.scientificamerican.com/article/climate-change-may-speed-asthma-spread/>

#### **Climate Impact: Australia**

In the great barrier reef, climate change has caused unusually hot waters. This has forced corals to release symbiotic algae from their tissue (a process called bleaching). Without the algae --their source of food-- corals become weak. Amidst current climate conditions, coral are not given enough of an opportunity to rebound before the next bleaching episode, and most die.

We are losing the biggest structure made by living organisms on our planet and one of the seven wonders of the world. <http://news.nationalgeographic.com/2017/04/great-barrier-reef-climate-change-coral-bleaching/>

#### **Climate Impact: Brazil**

In Brazil, this baby who suffers from microcephaly and Guillain-Barré syndrome was born. Both diseases are congenital brain abnormalities, and both are caused by mothers contracting the Zika virus during pregnancy. The initial Brazilian outbreak of Zika was driven by a fierce El Niño, and higher temperatures than usual. Many prevalent human infections, including malaria, dengue fever, and cholera, are climate sensitive. In some cases, such as with malaria and dengue fever, this is in part because the disease is transmitted by mosquitoes which cannot survive if temperatures are too low.

<http://www.chgeharvard.org/topic/climate-change-and-infectious-disease>

Increases in precip....temp increase spread....tse tse?

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5300271/>

#### **Climate Impact: China**

In the Pearl River Delta of China, climate change is contributing to a dramatic increase in flooding. Individual cities in the region have spent over \$100 million on flood damage alone. Moreover, floods have caused tens of thousands of people to lose their homes and ruined vast swaths of farmland. Global flooding is predicted to triple by 2030, increasing annual economic flooding costs from \$83 billion to \$438 billion. <http://www.lincolnst.edu/publications/articles/urban-development-climate-change-chinas-pearlriver-delta>