

# Climate Change Update 6.2.17



## CURRENT CONTEXT

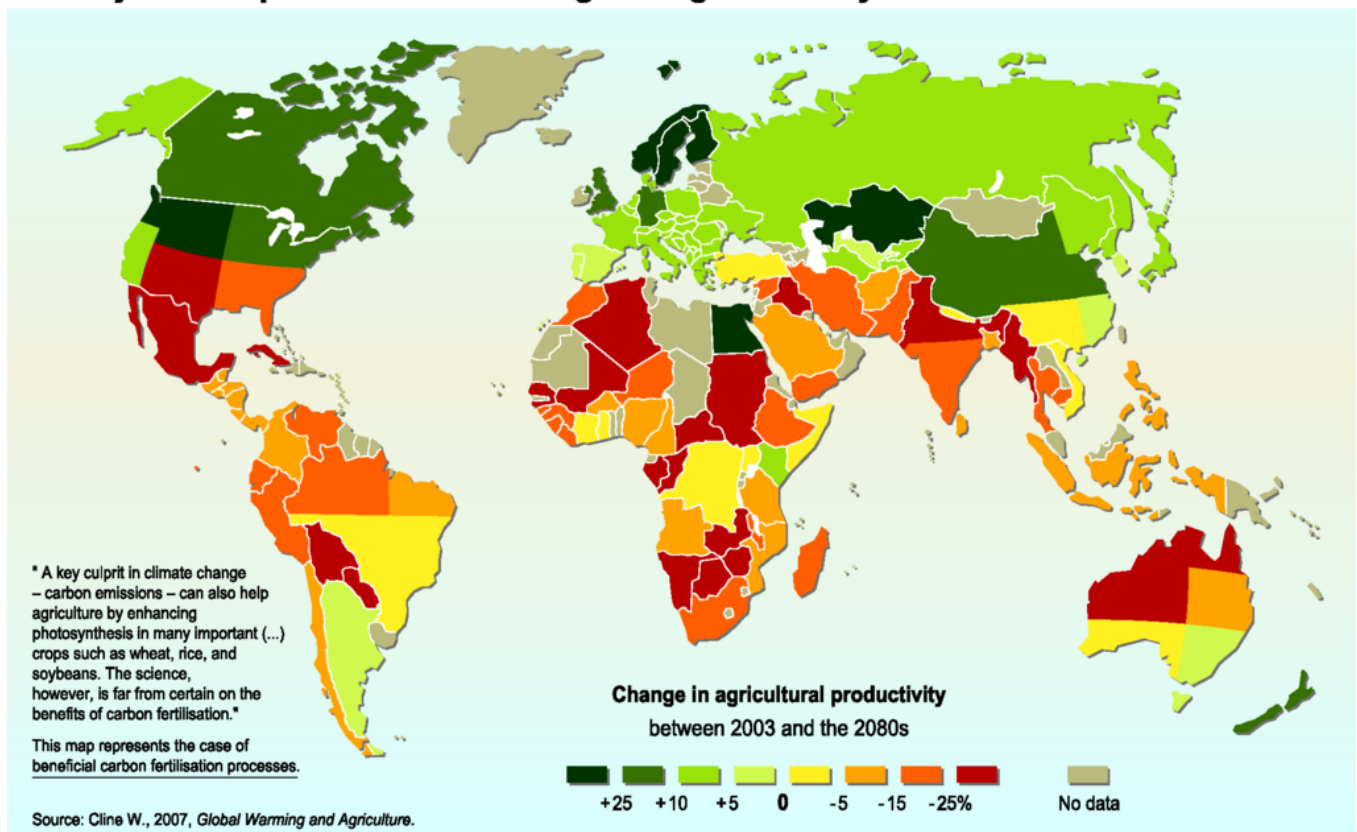
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In a move that created headlines worldwide, President Donald Trump chose to pull the United States out of the 2015 climate agreement signed by nearly all the world's nations. Trump expressed interest in a new agreement, as long it would be one he deems as "fair to the United States, its businesses, its workers, its people, its taxpayers." In his decision to withdraw the United States from the 2015 Paris Agreement, Trump argued that the Agreement's commitment to reduce greenhouse gas emissions is a poor economic deal for the United States. Many of his supporters are skeptical about climate change science, and believe that complying with the climate agreement would cause more oil and coal jobs to be lost than could be gained in the clean energy sector (wind, solar, geothermal, etc.). But what else is at stake, aside from sectors of the energy industry?

The majority of scientists from around the world maintain that **greenhouse gas** emissions contribute to a warming of the planet and are already affecting weather patterns and melting polar ice caps. Scientists believe that under threat are the very existence of low-lying coastal areas (where one billion, or around 1/7<sup>th</sup> of the world's population lives) and the viability of agriculture in many traditional growing regions. The higher the temperature rises, the more severe these developments will be. The United Nations Secretary General in 2015, Ban Ki-moon, opened the Paris climate talks with a challenge to nations to take "bold climate action" in order to increase "prosperity, security, and dignity for all." The outcome was an international commitment aimed at reducing warming to 2 degrees Celsius or less (through such measures as transitioning to more **renewable energy** sources). The agreement also requires regular assessments and reporting on each nation's progress. These measures alone will not arrest climate change, but are an important sign of a global commitment to continued progress along these lines.

In 2015, under the leadership of President Barack Obama, the United States took an active role in the Paris climate talks. As the leader of one of the world's greatest greenhouse gas emitters (second only to China), President Obama had already outlined new regulations for reducing pollution from American coal-fired plants. China, too, came to the climate talks prepared to make progress.

### Projected impact of climate change on agricultural yields



Map from the European Environment Agency.

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Unhealthy air, caused by pollution in parts of China, is helping to motivate that nation to reduce its dependence on coal. Generally speaking, the wealthier countries that have engaged in industrialization and have a high material standard of living (personal automobiles, air travel, etc.) have created the bulk of the world's pollution. The Paris talks placed a greater responsibility on these countries for reducing emissions and providing financial support for developing countries that face (or will face) potentially debilitating droughts, sea level rise, and other effects of climate change. The Paris Agreement also called for assistance for developing countries to transition to more environmentally-friendly production methods.

California governor Jerry Brown leads the world's eighth largest economy, and is a committed leader in combatting climate change. State environmental policies that he has helped put in place, as well as others developed over the past several decades, suggest that making moves toward renewable energy sources can happen without harming the economy, a common critique of environmental regulations. Indeed, in 2006, California instituted the nation's first comprehensive program to reduce greenhouse gas emissions while maintaining a strong economy and job growth that outpaces the national average. The state has also made renewable energy 25% of its power supply, and has established an extensive [cap](#)



Rapidly melting glacier in Antarctica. Sea level rise accompanies glacier loss. Image from Jet Propulsion Laboratory, NASA.

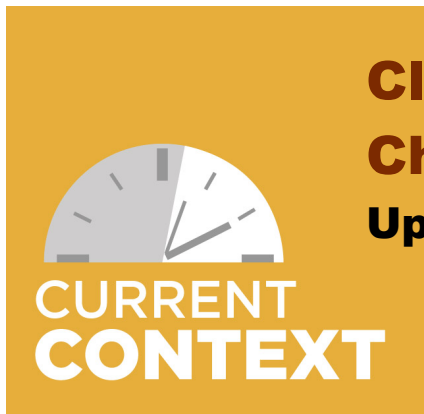
and trade program for polluting industries. A majority of Californians consistently rate climate change as a primary environmental concern, and drive almost half of the nation's electric vehicles. Governor Brown traveled to Paris to participate in the 2015 talks, and to join ranks with leaders from cities and regions around the world to commit to a 2-degree warming limit. Governor Brown has been a strong critic of President Trump's stance on environmental issues, and Brown has decided, in what he characterizes as the absence of national leadership on the issue, to maintain relationships with foreign nations committed to addressing climate change. Brown will attend an international clean energy summit in Beijing, China, scheduled for early June 2017.

Though climate change appears to be a relatively recent international concern, climate change awareness began long ago. Scientists first speculated about the impact of burning [fossil fuels](#) (coal, specifically) in the late nineteenth century. That century's industrial revolution saw the first large-scale use of fossil fuels to operate factories, railroads, and other machinery. The industrial pursuits that began in Western Europe and the United States soon spread to other parts of the world, precipitating a never-ending demand for fuel. By the end of the twentieth century, the cumulative impact of greenhouse emissions caused the international scientific community to reach consensus about the human causes of climate change.

The first international effort to address this issue occurred in Brazil in 1992. The setting made sense, as the enormous Amazon Rainforest, like all forests, offsets the impact of pollution by removing carbon dioxide from the atmosphere and releasing oxygen back into the atmosphere. A consistent challenge in international climate talks has been the lack of consensus among developed and developing nations alike about the type and extent of steps needed to address climate change. Reaching a commitment to counteract climate change requires overcoming (or outmaneuvering) the skeptics and opponents, and balancing the economic concerns associated with the daunting task of shifting away from industry's long-established fossil fuel dependency. International signatories to the Paris Agreement believe that these challenges are not only surmountable but absolutely necessary. The Paris Agreement entered into force in November 2016, with forward progress being made around the world on the hard work of making substantial and lasting change in greenhouse gas emissions. The extent to which the United States chooses to support this effort will significantly impact how successful worldwide climate action will be.

-Shelley Brooks, Ph.D., CHSSP Statewide Office

[Download](#) the December 2015 *Climate Change* edition.



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## A brief timeline on climate change:

**1712** - A British inventor creates a steam engine that runs on coal; sets the stage for the Industrial Revolution

**1824** - A French scientist detects the natural “greenhouse effect” that raises the temperature of the earth

**1896** - A Swedish scientist determines that burning coal can increase the greenhouse effect

**1927** - One billion tons per year of carbon emissions from industry and other fossil fuel burning

**1938** - A British engineer studies records from 147 weather stations around the world and determines that temperatures rose over the previous century, suggesting that the rise in CO<sub>2</sub> concentrations caused the warming

**1957** - Two scientists determine that the ocean will not absorb all the rising CO<sub>2</sub>, as many had believed

**1965** - A U.S. presidential advisory committee reports that the greenhouse effect is of “real concern”

**1972** - The United Nations holds its first conference on the environment, but focuses on chemical pollution, atomic bomb testing and whaling; climate change is only a minor topic of concern

**1975** - The term “global warming” is used in a scientific paper

**1987** - A global agreement known as the Montreal Protocol protects the ozone layer by restricting damaging chemicals

**1988** - The Intergovernmental Panel on Climate Change (IPCC) forms to collect and analyze data on climate change

**1989** - Six billion tons per year of carbon emissions from burning fossil fuels

**1992** - Earth Summit in Brazil brings agreement among governments to work to stabilize greenhouse gas concentrations in the atmosphere

## KEY TERMS

**Fossil fuels** - fuels such as coal, oil, and natural gas, formed from the remains of plants and animals that lived millions of years ago. This is a finite, non-renewable energy source.

**Greenhouse gases** - result from the burning of fossil fuels for industry, energy, and transportation, and trap heat in the atmosphere that contributes to rising temperatures and weather extremes. Carbon dioxide is one such gas, as is methane and chlorofluorocarbons (CFCs).

**Cap and trade program** – sets a limit on greenhouse emissions, which are lowered over time to further reduce pollution. The companies that conserve the most can sell their emission allowances to companies not yet energy-efficient.

**Renewable energy** - an energy source that is naturally replenished, not depleted, such as solar, wind, geothermal or hydroelectric action.

**1997** - Developed nations agree in the Kyoto Protocol to reduce emissions by an average of 5% over the next fifteen years; U.S. Senate refuses to ratify the treaty

**2006** - A report indicates that the current level of emissions could cause up to a 20% drop in global GDP, and costs to lower emissions would cost about 1% of global GDP

**2006** - Eight billions tons per year of carbon emissions from burning fossil fuels

**2006** - California passes the Global Warming Solutions Act, the nation’s first comprehensive program to reduce greenhouse gas emissions

**2009** - In Copenhagen, modest progress made on agreements meant to reduce global emissions

**2010** - Global meeting in Mexico to create agreements on climate change; a program established to help developing countries deal with the impacts of climate change

**2015** - Climate talks in Paris result in agreement from nearly all countries to work to continually reduce emissions, and to report regularly on progress

**2017** - President Donald Trump pulls the United States out of the climate agreement reached in Paris in 2015

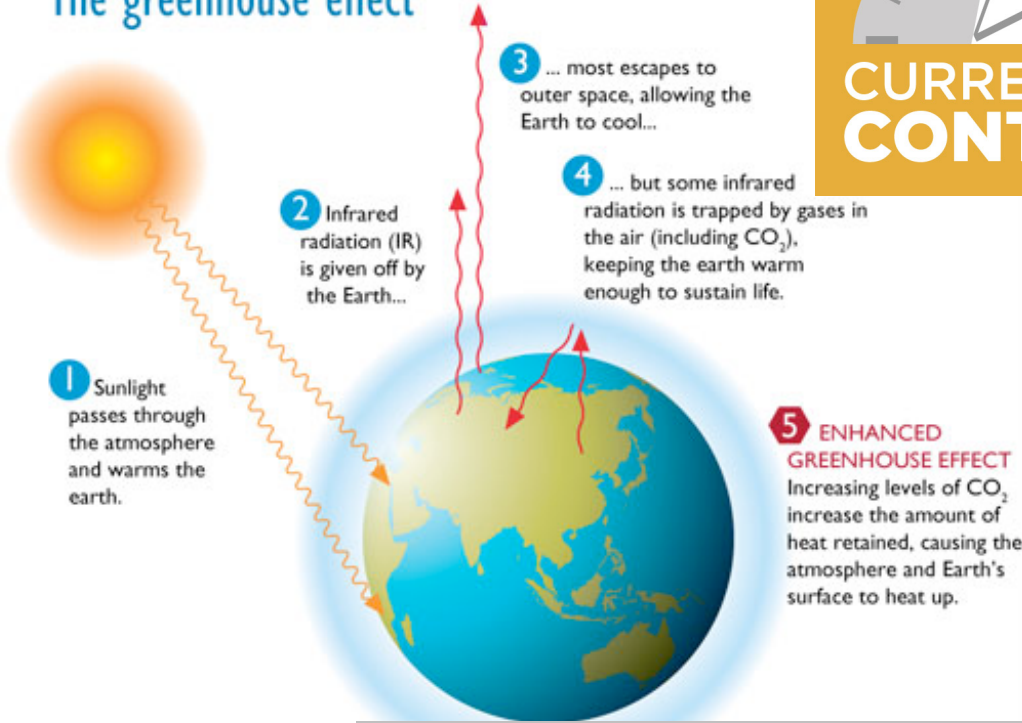
Timeline developed from PBS Now and the BBC. <http://www.pbs.org/now/science/climatechange.html> and <http://www.bbc.com/news/science-environment-15874560>





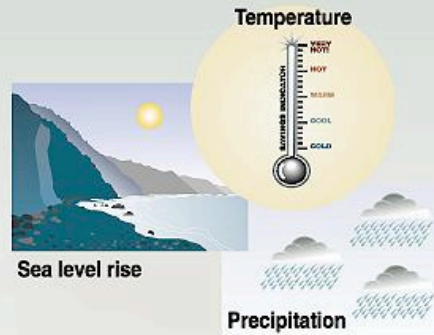
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### The greenhouse effect



Source: [CO2 Cooperative Research Centre](#)

### Potential climate changes impact



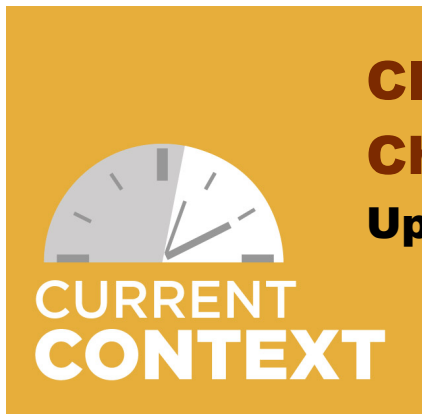
### Impacts on...

Health	Agriculture	Forest	Water resources	coastal areas	Species and natural areas
Weather-related mortality Infectious diseases Air-quality respiratory illnesses	Crop yields Irrigation demands	Forest composition Geographic range of forest Forest health and productivity	Water supply Water quality Competition for water	Erosion of beaches Inundation of coastal lands additional costs to protect coastal communities	Loss of habitat and species Cryosphere: diminishing glaciers

Source: United States Environmental Protection Agency

GRID Arendal UNEP  
Source: United States environmental protection agency (EPA).

GRAPHIC DESIGN : PHILIPPE REKACEWICZ



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CHSSP Teaching Blog: [Taking Action on Climate Change](#)

## Additional Resources\*

### United States Withdraws from Paris Agreement:

- Los Angeles Times: <http://www.latimes.com/politics/washington/la-na-essential-washington-updates-trump-s-decision-to-withdraw-from-paris-1496355576-htmlstory.html>
- New York Times: [https://www.nytimes.com/interactive/2017/05/31/climate/trump-climate-paris-agreement.html?em\\_pos=medium&emc=edit\\_up\\_20170602&nl=upshot&nl\\_art=6&nlid=72576062&ref=headline&te=1&r=0](https://www.nytimes.com/interactive/2017/05/31/climate/trump-climate-paris-agreement.html?em_pos=medium&emc=edit_up_20170602&nl=upshot&nl_art=6&nlid=72576062&ref=headline&te=1&r=0)
- Fox News: <http://www.foxnews.com/politics/2017/06/01/real-options-for-fake-climate-treaty.html>

### Paris Climate Talks:

- The Guardian: <http://www.theguardian.com/commentisfree/2015/dec/07/paris-climate-change-deal-summit-guide>
- The New York Times: [http://www.nytimes.com/2015/12/13/world/europe/climate-change-accord-paris.html?\\_r=0](http://www.nytimes.com/2015/12/13/world/europe/climate-change-accord-paris.html?_r=0)
- United National Conference on Climate Change: <http://www.cop21.gouv.fr/en/>

### History of Climate Change/National & International Response:

- Scientific American: <http://www.scientificamerican.com/article/discovery-of-global-warming/>
- The Washington Post: <https://www.washingtonpost.com/news/the-fix/wp/2015/12/01/congresss-long-history-of-inaction-on-climate-change-in-6-parts/>
- The San Francisco Chronicle: <http://www.sfchronicle.com/bayarea/article/Gov-Jerry-Brown-marches-California-climate-6660918.php>
- The New York Times: [http://www.nytimes.com/interactive/2015/11/28/science/what-is-climate-change.html?\\_r=0](http://www.nytimes.com/interactive/2015/11/28/science/what-is-climate-change.html?_r=0)
- Center for Climate and Energy Solutions: <http://www.c2es.org/international/history-international-negotiations>

### Educating about Climate Change:

- Education and the Environment Initiative (EEI) curriculum units (see 12th grade *Sustaining Economies and the Earth's Resources & Making and Implementing Environmental Laws*; 11th grade *Many Voices, Many Visions: Analyzing Contemporary Environmental Issues*; 10th grade *Britain Solves a Problem and Creates the Industrial Revolution*; 8th grade *Agricultural and Industrial Development in the United States (1877-1914)*; 4th grade *Reflections of Where We Live*: <http://www.californiaeei.org/curriculum/>
- The New York Times: [http://www.nytimes.com/interactive/2015/12/03/upshot/what-you-can-do-about-climate-change.html?\\_r=0](http://www.nytimes.com/interactive/2015/12/03/upshot/what-you-can-do-about-climate-change.html?_r=0)
- U.S. Environmental Protection Agency: <http://www3.epa.gov/climatechange/wycd/>
- United Nations and Climate Change: <http://www.un.org/climatechange/take-action/>

\*The resources listed above are provided for further research and do not imply an endorsement by the California History-Social Science Project or the University of California.

### Images:

Projected impact on agriculture: <https://www.eea.europa.eu/data-and-maps/figures/projected-impact-of-climate-change>  
Antarctica glacier: <https://www.jpl.nasa.gov/news/news.php?release=2014-148>