Climate Change

CURRENT CONTEXT

CALIFORNIA history-social science PROJECT CHSSP

World leaders recently met in Paris to craft an historic agreement regarding climate change. For the first time, nearly every nation committed to reducing its greenhouse gas emissions that contribute to a warming of the planet. Such warming is already affecting weather patterns and melting polar ice caps that lead to sea level rise. What is at stake? Scientists believe that under threat are the very existence of low-lying coastal areas (where one billion, or around 1/7th of the world's population lives) and the viability of agriculture in many traditional growing regions. The greater the temperature rise, the more severe these developments will be.

United Nations Secretary-General Ban Ki-moon opened the Paris conference with these words: "You are here today to write the script for a new future. A future of hope and promise – of increased prosperity, security and dignity for all." He encouraged nations to see climate change as a threat to all of humanity, and to see "bold climate action" as in the interest of everyone. 186 signatories agreed to implement measures in their countries aimed at eventually reducing the warming to 2 degrees Celsius or less (such 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.

The United States and China, the largest emitters of greenhouse gases, came prepared to make progress at the conference. President Obama had already outlined new regulations for reducing pollution from American coal-fired plants. Meanwhile, unhealthy air in parts of China motivated 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, and can also use assistance to transition to more environmentally-friendly production methods.

California, the world's eighth largest economy, has both great responsibility and great ambition to be a leader in combatting climate change. Its efforts suggest that making moves toward renewable energy sources (solar, wind, geothermal, etc.) 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 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 Jerry Brown traveled to Paris to participate in the talks, and to join ranks with leaders from cities and regions around the world to commit to a 2-degree warming limit.

Though the momentum appears to be a recent phenomenon, 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. In the United States climate change has become a partisan issue, with many Republicans arguing against the climate change science. 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. The Paris agreement represents the international belief that these challenges are not only surmountable but absolutely necessary. Now comes the hard work of making substantial and lasting change in greenhouse gas emissions.

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

Climate Change

CURRENT CONTEXT

CALIFORNIA history-social science PROJECT CHSSP

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 CO2 concentrations caused the warming

1957 - Two scientists determine that the ocean will not absorb all the rising CO2, 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

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.

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

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

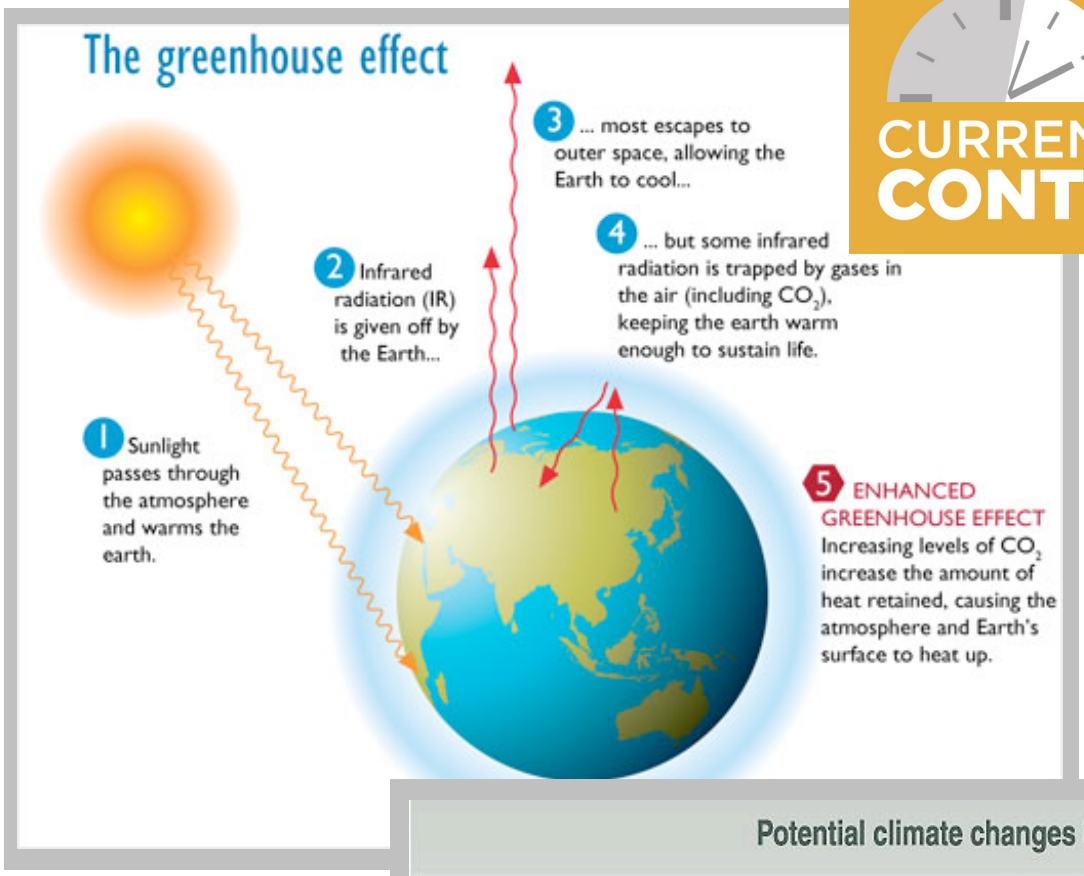
2006 - California passes the Global Warming Solutions Act, the nation's first comprehensive program to reduce greenhouse gas emissions

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

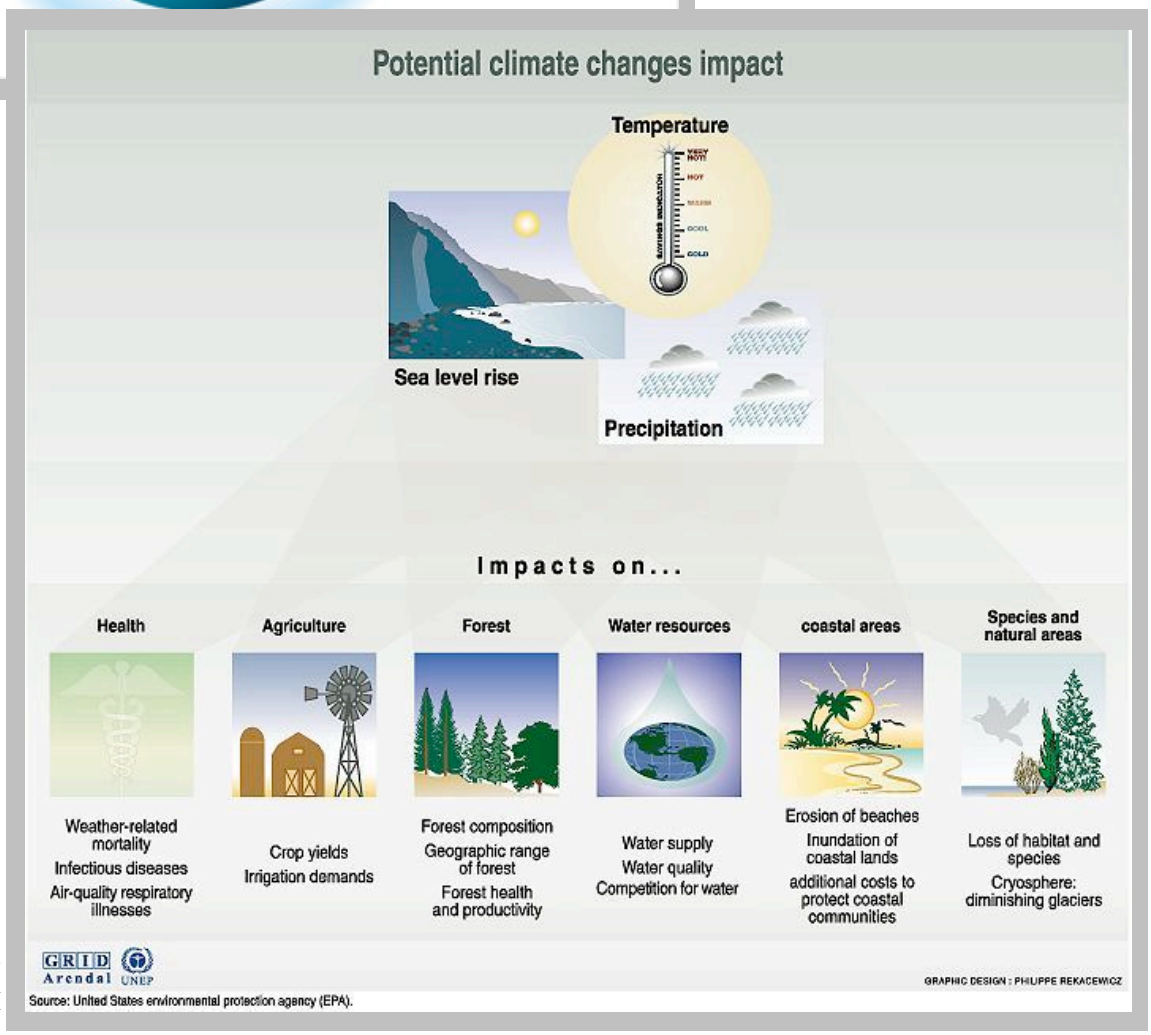
2010 - Global meeting in Mexico to create agreements on climate change; a program established to help developing countries deal with the impacts of climate change

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

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



Source: CO2 Cooperative Research



Source: United States Environmental Protection Agency

CALIFORNIA history-social science PROJECT CHSSP

CHSSP Teaching Blog: *Taking Action on Climate Change*

Additional Resources*

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
- 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
- Center for Climate and Energy Solutions: http://www.c2es.org/international/history-international-negotiations

Educating about Climate Change:

- The New York Times: 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.