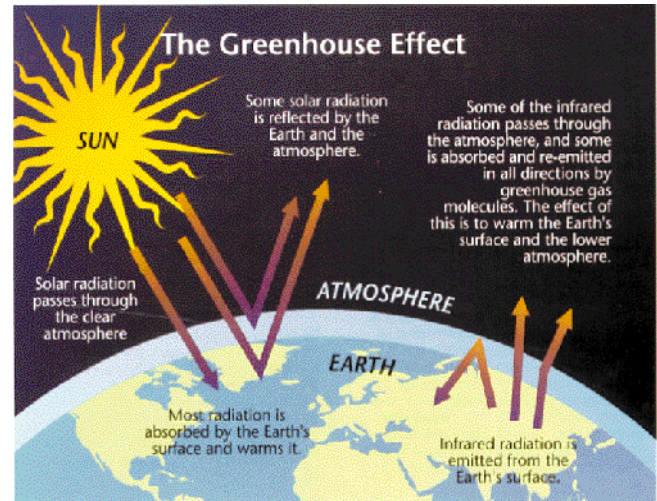


Global Warming and Climate Change

What is global warming?

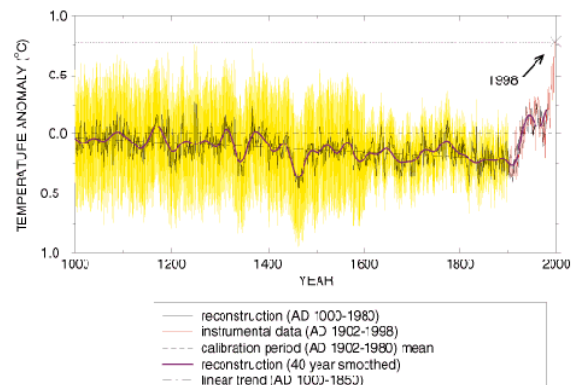
- ✓ **Global warming refers to a rise in average global temperature due to human activities: namely, the emissions of greenhouse gases produced by the burning of fossil fuels, and land-use changes like deforestation.**
- ✓ Scientists predict that higher temperatures will probably be accompanied by an increase in extreme weather events such as flooding and drought, as well as global sea-level rise. **While the first signs of global warming are apparent now, a sharp reduction of greenhouse gas emissions can significantly slow global warming.**

Los Alamos National Laboratory 1998



How does global warming function?

- ✓ Heat from the sun passes through our atmosphere where it is absorbed by the Earth's surface. Some of that heat is reflected back to space. Greenhouse gases in our atmosphere trap a portion of this reflected heat, preventing it from escaping, thus keeping Earth warmer than it otherwise would be. A majority of this greenhouse effect is natural, maintaining Earth's average temperature at about 60°F (15°C). Without the natural greenhouse effect, Earth's average temperature would be closer to 0°F (-18°C).
- ✓ **The atmospheric concentrations of several greenhouse gases are rising as a result of human activity.** Carbon dioxide, the most important human-made greenhouse gas, is released primarily by the burning of fossil fuels like coal, oil, and natural gas; CO₂ concentration has risen by 30% over its value in pre-industrial times. Concentrations of other greenhouse gases have also risen; methane levels have more than doubled and nitrous oxide (NO_x) levels are increasing as well.
- ✓ **There is a worldwide consensus among climate scientists that global average temperature has risen about 1°F (0.4°C-0.8°C) in the past 140 years.** Assessments by the U.S. National Academy of Sciences and the United Nations' Intergovernmental Panel on Climate Change (IPCC) find that most of the warming of the past 50 years is likely due to the accumulation of greenhouse gases. The graph at right shows constant temperatures over the past thousand years, with a marked rise in temperature since 1880.



Global Warming and Climate Change

What is the future of global warming?

- ✓ **According to the IPCC, Earth may warm by 2.5°F to 10.4°F (1.4-5.8°C) by the end of this century, potentially making our planet warmer than at any time since dinosaurs were dominant.**
- ✓ **Scientists project that Earth could experience the fastest warming in the history of civilization during the 21st century.** Such a global temperature rise would be associated with significant climate change impacts. The difference in global average temperature between modern times and the last ice age – when much of Canada and the northern United States were covered with a thick ice sheet – was only about 9°F (5°C). A temperature rise of similar magnitude could have serious, potentially devastating effects on society and ecosystems.

How are governments addressing this problem?

- ✓ **International agreements have called for a reduction in the emissions of greenhouse gases to reduce the effects of future global warming.** While the pace and magnitude of future climate change are still uncertain, there is widespread agreement among scientists and government officials on the key aspects of global warming. This consensus led to negotiation and signing of the United Nations Framework Convention on Climate Change at the 1992 Earth Summit held at Rio de Janeiro. The treaty embodied a voluntary commitment by industrial countries to return their emissions to 1990 levels by year 2000. The treaty was strengthened in 1997 by addition of the Kyoto Protocol, which calls for mandatory reductions of emissions by industrial countries (e.g., 7% below 1990 levels for the U.S. based on average emissions for the period 2008-2012).
- ✓ **Over 100 countries, including the European Union, Canada and Japan, have ratified the Kyoto Protocol.** It is expected to go into effect in early 2003.
- ✓ **The United States, the biggest emitter of greenhouse gases in the world, has refused to ratify the Kyoto Protocol.**

For more information go to www.environmentaldefense.org/go/globalwarming