

Climate Change

The Facts

Climate change is backed by science.

Burning fossil fuels releases billions of tons of carbon dioxide changing our climate.

Carbon dioxide acts like a blanket, trapping the sun's heat.

Our climate is changing at a rate higher than at anytime in all of human history.

If we reduce our carbon dioxide emissions we can slow the rate of change.

Physical Impacts

Global land and sea temperatures are rising.

The incidence of droughts, wildfires and flooding are increasing globally.

Glaciers and the permafrost are melting.

Ice at the North and South Poles is melting and breaking up.

Hurricanes, cyclones and typhoons are increasing in severity and frequency.

Fresh water resources are diminishing.

Social Impacts

Rising sea levels are flooding some areas.

Droughts are effecting our food supply.

Severe weather is contributing to loss of life, homes and livelihoods.

Disease carrying insects are moving into new areas as temperature increases.

Populations of insects, like the pine beetle are exploding with devastating effect.

Poor countries like Africa will be among the most severely disadvantaged as they have few resources to adapt to climate change.

Rivers have less regular flow, and water for drinking and crops is drying up.

Key Indicators for Climate Changes

Carbon Dioxide

Carbon dioxide (CO₂) is an important heat-trapping (greenhouse) gas, which is released through human activities such as deforestation and burning fossil fuels, as well as natural processes such as respiration and volcanic eruptions.

Global Temperature

Global surface temperatures show that the Earth has warmed since 1880. Most of this warming has occurred since the 1970s, with the 20 warmest years having occurred since 1981 and with all 10 of the warmest years occurring in the past 12 years.

Arctic Sea Ice

Arctic sea ice is now declining at a rate of 11.5 percent per decade, relative to the 1979 to 2000. The oceans have absorbed much of the increased greenhouse heat, with the top 2,300 feet of ocean showing warming of 0.302°F since 1969.

Land Ice

Data from NASA's Grace satellites show that the land ice sheets in both Antarctica and Greenland are losing mass. Between 2002 and 2005,

Greenland lost 36 to 60 cubic miles of ice per year, while Antarctica lost about 36 cubic miles of ice.

Glaciers are retreating almost everywhere around the world — including in the Alps, Himalayas, Andes, Rockies, Alaska and Africa.

Sea Level

Sea level rise is caused by two factors related to global warming— the added water coming from the melting of land ice and the expansion of seawater as it warms up.

Global sea level rose about 6.7 inches in the last century. The rate in the last decade, however, is nearly double that of the last century.

Extreme events

Since 1950 the number of record high temperature events in the United States has been increasing, while the number of record low temperature events has been decreasing. The U.S. has also witnessed increasing numbers of intense rainfall events, hurricanes and tornados.

source: **NASA Goddard Space Flight Center** <http://climate.nasa.gov/>

