

# Straight Talk on Global Warming

**W**ASHINGTON, DC—In 1998, the Northern Hemisphere's climate was warmer than it has been anytime in the past 1,000 years. Now the debate on global warming is heating up. If you're like most people, you've probably heard a lot of opposing views about global warming. Some say it's a menace, others claim it's a myth. Who's right?

To help make sense of these diverse views, the U.S. Environmental Protection Agency has summarized some of the most commonly heard misunderstandings about global warming, together with responses based on the best available scientific research.

**Myth:** *Scientists aren't sure that the world is really getting warmer.*

**Reality:** Skeptics question scientists' conclusion that the world has warmed by about 1 degree Fahrenheit over the past 100 years. Instead of attributing this apparently hotter climate to global warming, the skeptics blame some of the warming trend on the expansion of cities around formerly rural or suburban weather monitoring stations. According to these skeptics, heat generated by urban areas has caused an artificial or imagined warming trend. But researchers have found that ground-based temperature records show the same global warming trends even when adjusted for data from urban weather stations. Other skeptics consider the measured warming to be part of natural short-term cycles of temperature variation. But the longer the warming trend continues, the more difficult it is to attribute it to natural variation.

**Myth:** *Emissions of greenhouse gases from human activities are so tiny in comparison with natural sources that humans can't have any effect on climate.*

**Reality:** Natural sources of heat-trapping greenhouse gases like carbon dioxide are largely balanced by natural "sinks" for greenhouse gases, like oceans and forests that remove the gases from the atmosphere by absorption. People are adding more to the atmosphere than these sinks can absorb and at the same time are removing the forests. We know this because greenhouse gases released by the burning of fossil fuels carry a chemical "fingerprint" that scientists can use to trace the source of emissions. These chemical tracers show that the increase in carbon dioxide in the atmosphere over the past century has been caused by people.

**Myth:** *Satellite-based temperature readings, which show a cooling trend, are more accurate than the ground-based temperature record, which indicates a warming trend.*

**Reality:** The satellite data provide estimates of temperatures from ground level to 4 miles in altitude. One new study suggests that when the satellite data are corrected to take into account changes in the satellite's orbit, a slight warming trend results.

**Myth:** *Rising emissions of greenhouse gases will stimulate plant growth, acting as a natural brake on global warming as thriving crops and forests absorb more carbon dioxide out of the atmosphere.*

**Reality:** Although studies have shown that carbon dioxide does indeed stimulate plant growth, nature is more complicated than the laboratory. Plants and natural ecosystems are likely to respond in diverse ways to changes in carbon dioxide and climate. Increases in carbon dioxide may cause some plants to be less nutritious to humans and animals. Most studies also point to the increased risk of droughts from global warming in the Midwest and other key agricultural regions.

These changes in rainfall patterns may override any benefits from increased carbon dioxide.

**Myth:** *We can't even predict next week's weather accurately, so computer models can't possibly forecast global warming.*

**Reality:** Climate models are very different from the models used by daily weather forecasters. They are global rather than local in scope, and they are used to simulate past and future average weather conditions over long timeframes, such as 100 years or more. The climatic changes that the models have "predicted" for the 20<sup>th</sup> century correspond well with actual observed changes in temperature and precipitation.

Climate modelers understand the limitations of models, but the evidence for global warming so far is compelling. Most places in the world already are experiencing changes in temperature and precipitation in ways that the models have predicted for global warming. The six warmest years on record have all occurred in the 1990s. Global mean sea level has risen by 4 to 10 inches over the last 100 years. Along the U.S. Gulf and Atlantic shores, sea level has risen about 1 foot in the last 100 years. A significant number of mountain glaciers are melting in many parts of the world, permafrost in Alaska is thawing, and Arctic sea ice is in retreat.

The existence of uncertainty does not mean that global warming is not a serious problem. Uncertainty is part of all scientific research. The evidence gathered by scientists suggests that it would make sense to develop reasonable solutions that will ensure a safer future.

For more information on global warming, Visit EPA's global warming website at <http://www.epa.gov/globalwarming>.