




Common Questions on Climate Change

A temperature increase of 1.5°F since 1850 doesn't sound like much. Why are scientists so concerned?

Small changes in average temperature can have big effects.

-  **1.5°F is an average increase, so some areas of the Earth have warmed more than others.** Seasonal temperatures also increase unequally, with winter temperatures increasing more than summer temperatures^{1,2}.
-  Some parts of the Arctic have already warmed more than 5°F, causing permafrost and ice sheets to melt. In contrast, tropical regions have experienced little warming².
-  Coral reef bleaching (where stressed corals expel their symbiotic algae) may occur at sea temperatures 1.8°F above average summer maximum temperatures³.




Quiz yourself!

When the average temperature in New England was 9°F cooler, what was a typical day in Boston like?

- A. Same as today
- B. More fall and winter days
- C. Similar to northern Canada
- D. Under a mile-high ice sheet

I've heard that global warming is part of a natural cycle. Isn't the temperature increase just part of the variation?

It is true that temperature and carbon dioxide levels have fluctuated over time:

-  In the last 650,000 years, the concentration of CO₂ in the atmosphere has ranged between 180 to 300 parts per million (ppm). Our current atmospheric CO₂ concentration is much higher, at 380 ppm, and is continuing to increase²!
-  In the last 10,000 years, the average temperature of the Earth's surface has not varied by more than 2°F.²
-  The *rate* of warming is increasing. For the past 50 years, global surface temperatures have been increasing by 0.2°F. This is nearly **twice the rate of temperature increase** from the past 100 years².




Quiz yourself!

Which animal's habitat has already been affected by climate change?

- A. Polar Bear
- B. Mosquito
- C. Coral Reefs
- D. All of the above

Isn't there a debate within the scientific community over the causes and effects of climate change?

Contrary to reports in the popular media, there is little scientific debate about the main points of climate change.

-  A survey of 928 peer-reviewed scientific articles found that **none of the articles disagreed with the consensus** that climate change is caused by human carbon emissions⁴.
-  The Intergovernmental Panel on Climate Change (IPCC) reported in 2007 that the temperature increases we have observed so far are **"very likely" (better than nine to one odds) caused by human heat-trapping gas emissions**².
-  Although different climate models do not produce identical predictions, they agree on the general patterns of warming, and on many aspects of precipitation patterns.




Quiz yourself!

Carbon dioxide (CO₂) emissions affect the atmospheric CO₂ concentration. If we reduce emissions by 30% this century, how would this affect atmospheric CO₂ concentrations?

- A. Decrease by 30%
- B. No change
- C. Continue to rise, but at a slower rate

If climate change is going to happen in the future, why is it an important issue now?

Climate change has already started, and slowing or reversing the process will take a long time.

-  From 1995 to 2006 the Earth's surface had 11 of the 12 warmest years since 1850²
-  Even if we only emitted heat-trapping gases at year 2000 levels, the Earth's surface would continue to warm at about 0.2°F per decade²
-  **There won't be a simple solution** to the problem of climate change, so it is imperative to take action now.

Quiz yourself!

The Clean Air Act of 1990 regulates the emissions of pollutants such as sulfur dioxide, a cause of acid rain. What is one possible effect of sulfur dioxide reduction on climate change?

- A. The rate of global warming could increase
- B. With cleaner air, global warming will become less of a problem

Created by Joy Cookingham for the Boston Area Climate Experiment (2007)
References
1 Hayhoe et al. (2007), *Clim Dyn* 28:381-407
2 IPCC (2007) Fourth Assessment Report Summary for Policymakers
3 Hughes et al. (2003) *Science* 301:929-933
4 Oreskes (2004), *Science* 306:1686