



Fact or Fiction (1 of 2)

1. The Earth's climate is changing due to global warming.

Supported by science. Over the past 100 years, the average surface temperature on Earth has increased by more than 0.8° C (1.4° F) (NRC, 2012). This average increase in global surface temperature is known as global warming and can create other changes in climatic conditions, such as changes in precipitation trends and extreme weather events. This change is over and above the changes that happen due to solar activity and planetary orbit. Most climatologists believe the long-term changes in land ice in the Arctic and sea level rise are the first signs that our climate is changing due to global warming.

2. Climate change will affect regions of the Earth differently, with some areas becoming wetter and others becoming drier.

Supported by science. Increases in greenhouse gas emissions result in more heat being trapped in Earth's atmosphere. This increase in heat will mean more evaporation from Earth's surface, which can reduce soil moisture and increase drought in some places, while increasing rainfall and extreme storm events in others. Polar regions are projected to experience a greater degree of temperature change than tropical regions.

3. The impacts of climate change will not really affect people or the systems we depend upon (such as food, water, places to live, etc.), just temperature.

Not supported by science. Even though global warming affects temperature directly, the climate system is deeply interconnected and a variety of weather-related impacts are likely, such as long-term alterations to precipitation patterns, reduction in sea ice, increase in sea level, and higher frequency of extreme weather events. These changes affect ecosystems that people depend on. Changes in temperature and precipitation affect the ability to grow food throughout the world. Global sea level rise affects coastal habitats for both humans and wildlife. Climate change alters the frequency and intensity of weather events, such as extreme heat and cold periods, droughts, floods, winter storms, thunderstorms and tornados, and hurricanes, all of which affect humans and the environmental systems on which we depend.

4. Sea level rise is mostly caused by melting icebergs and ice sheets.

Not supported by science. The rise in sea level is attributed to two main causes: ocean expansion due to warmer temperatures and the melting of glaciers and polar land ice. Like any body of liquid, a warmer ocean expands as the molecules move at greater speeds, and bigger oceans lap higher along shorelines. Sea levels are also affected by melting glaciers and polar land ice—both of which originate on land and therefore contribute additional water to the ocean when melted. On the other hand, melting sea ice (ice already in the ocean, such as icebergs and ice sheets), does not contribute to changes in sea level because the ice is already displacing water in the ocean and, therefore, does not contribute to overall changes in the volume of the ocean when melted.

5. Burning fossil fuels is the only cause of global warming.

Not supported by science. Global warming is caused by a combination of human and natural factors. The increase in burning fossil fuels since the Industrial Revolution is one of the main causes, but other factors such as land-use changes from an increasing human population also contribute to global warming.



Fact or Fiction (2 of 2)

6. Seasonal melting of Arctic Sea ice and glaciers is evidence of climate change.

Not supported by science. Arctic Sea ice melts every year due to a change in season. To measure whether the overall extent of sea ice is changing, scientists compare the extent of ice during the same months over several years.

However, when comparing extent of winter ice in the Arctic, large negative trends are now found in nearly all of the peripheral seas, with the exception of the Bering Sea. If this long-term trend is statistically significant, it will be evidence of climate change.

7. The greenhouse effect is a natural process that supports life on Earth.

Supported by science. The greenhouse effect is a natural process that supports life on Earth. It can be thought of as a blanket that insulates Earth. Energy from the sun hits Earth, and while some of this solar radiation is absorbed at the planet's surface, some is re-radiated back toward space. The re-radiated energy either returns to space or is "trapped" by greenhouse gases. This trapped heat warms Earth's surface and the lower atmosphere.

8. Many climate scientists disagree about the causes of climate change.

Not supported by science. Studies indicate that between 97 and 99 percent of climate scientists agree that human activities are responsible for most of the climate changes being observed. Public opinion about climate change is influenced by many factors and although scientists agree, the general public in the United States does not currently have consensus regarding climate change.