

Global Warming Myths and Facts



MYTH: The science of global warming is too uncertain to act on.

FACT: There is no debate among scientists about the basic facts of global warming.

The most respected scientific bodies have stated unequivocally that global warming is occurring, and people are causing it by burning fossil fuels (like coal, oil and natural gas) and cutting down forests. The U.S. National Academy of Sciences, which in 2005 the White House called "the gold standard of objective scientific assessment," issued a joint statement with 10 other National Academies of Science saying "the scientific understanding of climate change is now sufficiently clear to justify nations taking prompt action. It is vital that all nations identify cost-effective steps that they can take now, to contribute to substantial and long-term reduction in net global greenhouse gas emissions." ([Joint Statement of Science Academies: Global Response to Climate Change \[PDF\]](#), 2005)

The only debate in the science community about global warming is about how much and how fast warming will continue as a result of heat-trapping emissions. Scientists have given a clear warning about global warming, and we have more than enough facts — about causes and fixes — to implement solutions right now.

MYTH: Even if global warming is a problem, addressing it will hurt American industry and workers.

FACT: A well designed trading program will harness American ingenuity to decrease heat-trapping pollution cost-effectively, jumpstarting a new carbon economy.

Claims that fighting global warming will cripple the economy and cost hundreds of thousands of jobs are unfounded. In fact, companies that are already reducing their heat-trapping emissions have discovered that cutting pollution can save money. The cost of a comprehensive national greenhouse gas reduction program will depend on the precise emissions targets, the timing for the reductions and the means of implementation. An independent MIT study found that a modest cap-and-trade system would cost less than \$20 per household annually and have no negative impact on employment.

Experience has shown that properly designed emissions trading programs can reduce compliance costs significantly compared with other regulatory approaches. For example, the U.S. acid rain program reduced sulphur dioxide emissions by more than 30 percent from 1990 levels and cost industry a fraction of what the government originally estimated, according to EPA. Furthermore, a mandatory cap on emissions could spur technological innovation that could create jobs and wealth. Letting global warming continue until we are forced to address it on an emergency basis could disrupt and severely damage our economy. It is far wiser and more cost-effective to act now.

MYTH: Water vapour is the most important, abundant greenhouse gas. So if we're going to control a greenhouse gas, why don't we control it instead of carbon dioxide (CO₂)?

FACT: Although water vapour traps more heat than CO₂, because of the relationships among CO₂, water vapour and climate, to fight global warming nations must focus on controlling CO₂.

Atmospheric levels of CO₂ are determined by how much coal, natural gas and oil we burn and how many trees we cut down, as well as by natural processes like plant growth. Atmospheric levels of water vapour, on the other hand, cannot be directly controlled by people; rather, they are determined by temperatures. The warmer the atmosphere, the more water vapour it can hold. As a result, water vapour is part of an amplifying effect. Greenhouse gases like CO₂ warm the air, which in turn adds to the stock of water vapour, which in turn traps more heat and accelerates warming. Scientists know this because of satellite measurements documenting a rise in water vapour concentrations as the globe has warmed.

The best way to lower temperature and thus reduce water vapour levels is to reduce CO₂ emissions.

MYTH: Global warming and extra CO₂ will actually be beneficial — they reduce cold-related deaths and stimulate crop growth.

FACT: Any beneficial effects will be far outweighed by damage and disruption.

Even a warming in just the middle range of scientific projections would have devastating impacts on many sectors of the economy. Rising seas would inundate coastal communities, contaminate water supplies with salt and increase the risk of flooding by storm surge, affecting tens of millions of people globally. Moreover, extreme weather events, including heat waves, droughts and floods, are predicted to increase in frequency and intensity, causing loss of lives and property and throwing agriculture into turmoil.

Even though higher levels of CO₂ can act as a plant fertilizer under some conditions, scientists now think that the "CO₂ fertilization" effect on crops has been overstated; in natural ecosystems, the fertilization effect can diminish after a few years as plants acclimate. Furthermore, increased CO₂ may benefit undesirable, weedy species more than desirable species.

Higher levels of CO₂ have already caused ocean acidification, and scientists are warning of potentially devastating effects on marine life and fisheries. Moreover, higher levels of regional ozone (smog), a result of warmer temperatures, could worsen respiratory illnesses. Less developed countries and natural ecosystems may not have the capacity to adapt.

The notion that there will be regional "winners" and "losers" in global warming is based on a world-view from the 1950's. We live in a global community. Never mind the moral implications — when an environmental catastrophe creates millions of refugees half-way around the world, Americans are affected.

MYTH: Global warming is just part of a natural cycle. The Arctic has warmed up in the past.

FACT: The global warming we are experiencing is not natural. People are causing it.

People are causing global warming by burning fossil fuels (like oil, coal and natural gas) and cutting down forests. Scientists have shown that these activities are pumping far more CO₂ into the atmosphere than was ever released in hundreds of thousands of years. This buildup of CO₂ is the biggest cause of global warming. Since 1895, scientists have known that CO₂ and other greenhouse gases trap heat and warm the earth. As the warming has intensified over the past three decades, scientific scrutiny has increased along with it. Scientists have considered and ruled out other, natural explanations such as sunlight, volcanic eruptions and cosmic rays. (IPCC 2001)

Though natural amounts of CO₂ have varied from 180 to 300 parts per million (ppm), today's CO₂ levels are around 380 ppm. That's 25% more than the highest natural levels over the past 650,000 years. Increased CO₂ levels have contributed to periods of higher average temperatures throughout that long record. (Boden, Carbon Dioxide Information Analysis Center)

As for previous Arctic warming, it is true that there were stretches of warm periods over the Arctic earlier in the 20th century. The limited records available for that time period indicate that the warmth did not affect as many areas or persist from year to year as much as the current warmth. But that episode, however warm it was, is not relevant to the issue at hand. Why? For one, a brief regional trend does not discount a longer global phenomenon.

We know that the planet has been warming over the past several decades and Arctic ice has been melting persistently. And unlike the earlier periods of Arctic warmth, there is no expectation that the current upward trend in Arctic temperatures will reverse; the rising concentrations of greenhouse gases will prevent that from happening.

MYTH: We can adapt to climate change — civilisation has survived droughts and temperature shifts before.

FACT: Although humans as a whole have survived the vagaries of drought, stretches of warmth and cold and more, entire societies have collapsed from dramatic climatic shifts.

The current warming of our climate will bring major hardships and economic dislocations — untold human suffering, especially for our children and grandchildren. We are already seeing significant costs from today's global warming which is caused by greenhouse gas pollution. Climate has changed in the past and human societies have survived, but today six billion people depend on interconnected ecosystems and complex technological infrastructure.

What's more, unless we limit the amount of heat-trapping gases we are putting into the atmosphere, we will face a warming trend unseen since human civilization began 10,000 years ago. (IPCC 2001)

The consequences of continued warming at current rates are likely to be dire. Many densely populated areas, such as low-lying coastal regions, are highly vulnerable to climate shifts. A middle-of-the-range projection is that the homes of 13 to 88 million people around the world would be flooded by the sea each year in the 2080s. Poorer countries and small island nations will have the hardest time adapting. (McLean et al. 2001)

In what appears to be the first forced move resulting from climate change, 100 residents of Tegua island in the Pacific Ocean were evacuated by the government because rising sea levels were flooding their island. Some 2,000 other islanders plan a similar move to escape rising waters. In the United States, the village of Shishmaref in Alaska, which has been inhabited for 400 years, is collapsing from melting permafrost. Relocation plans are in the works.

Scarcity of water and food could lead to major conflicts with broad ripple effects throughout the globe. Even if people find a way to adapt, the wildlife and plants on which we depend may be unable to adapt to rapid climate change. While the world itself will not end, the world as we know it may disappear.

MYTH: Recent cold winters and cool summers don't feel like global warming to me.

FACT: While different pockets of the country have experienced some cold winters here and there, the overall trend is warmer winters.

Measurements show that over the last century the Earth's climate has warmed overall, in all seasons, and in most regions. Climate sceptics mislead the public when they claim that the winter of 2003–2004 was the coldest ever in the north-eastern United States. That winter was only the 33rd coldest in the region since records began in 1896. Furthermore, a single year of cold weather in one region of the globe is not an indication of a trend in the global climate, which refers to a long-term average over the entire planet.

MYTH: Global warming can't be happening because some glaciers and ice sheets are growing, not shrinking.

FACT: In most parts of the world, the retreat of glaciers has been dramatic. The best available scientific data indicate that Greenland's massive ice sheet is shrinking.

Between 1961 and 1997, the world's glaciers lost 890 cubic miles of ice. The consensus among scientists is that rising air temperatures are the most important factor behind the retreat of glaciers on a global scale over long time periods. Some glaciers in western Norway, Iceland and New Zealand have been expanding during the past few decades. That expansion is a result of regional increases in storm frequency and snowfall rather than colder temperatures — not at all incompatible with a global warming trend.

In Greenland, a NASA satellite that can measure the ice mass over the whole continent has found that although there is variation from month to month, over the longer term, the ice is disappearing. In fact, there are worrisome signs that melting is accelerating: glaciers are moving into the ocean twice as fast as a decade ago, and, over time, more and more glaciers have started to accelerate. What is most alarming is the prediction, based on model calculations and historical evidence, that an approximately 5.4 degree Fahrenheit increase in local Greenland temperatures will lead to irreversible meltdown and a sea-level rise of over 20 feet. Since the Arctic is warming 2-3 times faster than the global average, this tipping point is not far away.

The only study that has shown increasing ice mass in Greenland only looked at the interior of the ice sheet, not at the edges where melting occurs. This is actually in line with climate model predictions that global warming would lead to a short-term accumulation of ice in the

cold interior due to heavier snowfall. (Similarly, scientists have predicted that Antarctica overall will gain ice in the near future due to heavier snowfall.) The scientists who published the study were careful to point out that their results should not be used to conclude that Greenland's ice mass as a whole is growing. In addition, their data suggested that the accumulation of snow in the middle of the continent is likely to decrease over time as global warming continues.

MYTH: Accurate weather predictions a few days in advance are hard to come by. Why on earth should we have confidence in climate projections decades from now?

FACT: Climate prediction is fundamentally different from weather prediction, just as climate is different from weather.

It is often more difficult to make an accurate weather forecast than a climate prediction. The accuracy of weather forecasting is critically dependent upon being able to exactly and comprehensively characterise the present state of the global atmosphere. Climate prediction relies on other, longer ranging factors. For instance, we might not know if it will be below freezing on a specific December day in New England, but we know from our understanding of the region's climate that the temperatures during the month will generally be low. Similarly, climate tells us that Seattle and London tend to be rainy, Florida and southern California are usually warm, and the Southwest is often dry and hot.

Today's climate models can now reproduce the observed global average climates over the past century and beyond. Such findings have reinforced scientist's confidence in the capacity of models to produce reliable projections of future climate. Current climate assessments typically consider the results from a range of models and scenarios for future heat-trapping emissions in order to identify the most likely range for future climatic change.

MYTH: As the ozone hole shrinks, global warming will no longer be a problem.

FACT: Global warming and the ozone hole are two different problems.

The ozone hole is a thinning of the stratosphere's ozone layer, which is roughly 9 to 31 miles above the earth's surface. The depletion of the ozone is due to man-made chemicals like chlorofluorocarbons (CFCs). A thinner ozone layer lets more harmful ultraviolet (UV) radiation to reach the earth's surface.

Global warming, on the other hand, is the increase in the earth's average temperature due to the buildup of CO₂ and other greenhouse gases in the atmosphere from human activities.

See the [in-depth scientific report \[PDF\]](#) on the myths and facts of global warming by Dr. James Wang and Dr. Michael Oppenheimer.

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