



THE CLIMATE IS CHANGING:
WE CAN'T ESCAPE REALITY.

Confused about the science of climate change?

This myth-busting fact sheet helps to set the record straight.

Fact 1: There is strong scientific consensus that humans are causing climate change

The National Academies of Science from 19 countries (including the USA, UK, Australia, China and India), the Intergovernmental Panel on Climate Change (of more than 2,000 scientists from around the world) and the World Meteorological Organization, all agree that climate change is caused by human activities. In one survey, 97.4% of climate scientists actively publishing climate papers endorsed the consensus position.

Climate scientists back up their opinions with research and data, just like any other field of science. Climate research is peer reviewed by experts in their field, thoroughly assessing the quality and validity of the data, methods, results and conclusions of their studies.

Fact 2: Our greenhouse gas emissions are causing climate change.

The earth's climate has changed in the past. Changes in the earth's orbit, the activity of the sun, or levels of greenhouse gases can all change the amount of energy entering and leaving the earth, so shifts in their balance mean that the earth warms or cools.

Retracing climate changes over millions of years shows that when levels of heat-trapping greenhouse gases increase (for example due to massive eruptions) the earth gets warmer. This time, it's us: Human activities, mainly burning fossil fuels and clearing forests, have released billions of tons of CO₂ and other gases into the atmosphere over the last 200 years. Atmospheric CO₂ concentrations have increased by 30% over this time. Natural factors alone cannot explain the changes we are seeing. For example, the activity of the sun has actually decreased slightly over the last 40 years, while temperatures have risen worldwide.

Another key difference between natural cycles and what's currently happening is the *speed* of the changes. At the moment the changes are about 10 times faster than natural changes recorded in ice cores over the last 800 000 years.

Fact 3: Multiple, independent measurements show the earth is warming.

Temperature data from weather stations and balloons, ocean probes, boreholes and satellites all show evidence of a rise of about 0.8°C in global mean temperature since 1900 - more than half of which has occurred since 1979. Further evidence of warming is seen in reductions in snow cover, Arctic sea ice and the ice mass of Antarctica, retreat of glaciers, longer growing seasons, and shifts in distributions of animals and plants.

And in Australia - the Bureau of Meteorology has reported that since 1950, temperatures have risen on average by about 1°C with an increase in the frequency of heat waves, a decrease in the numbers of frosts and cold days, and changes in rainfall patterns.



Fact 4: It will be cheaper and more effective in the long term to fight climate change now, than to adapt to it.

We do not yet know exactly how severe the impacts of climate change may be on society - or how much they'll cost. What we do know is that if we act now, the costs of mitigating climate change are small (~1% of GDP per year to 2050). But if we wait, the costs of acting on climate change will rise to at least 20% of GDP per year by 2050, according to Stern and Garnaut. The sooner we act, the cheaper and easier it will be to transition to a low-carbon economy, and the less extreme our climate will become.

Fact 5: Increased carbon dioxide and hotter temperatures are not always good for plants.

Free Air Carbon Enrichment (or FACE) tests have been performed to check how increased CO₂ levels affect plant growth. They show that some plants perform better in carbon rich environments (e.g. invasive vines!) but these effects are only seen in some species, and are often only temporary. When combined with temperature increases, any positive effects can be reversed because the plants struggle to photosynthesise and survive in hotter climates. Additionally, climate change is likely to cause water shortages in many places, including Australia, and this will mean less water for agriculture, forestry and native ecosystems.

Fact 6: Water vapour is another important greenhouse gas, and its effects are exacerbated by increased levels of CO₂

Water vapour is the most abundant greenhouse gas, and the amount of water vapour in the atmosphere depends on temperature – for every 1°C rise in temperature, the atmosphere can hold 6% more water vapour! As CO₂ is causing a rise in temperature, this in turn increases the amount of water vapour in the air. So increasing the amount of CO₂ in the atmosphere causes warming directly, but also means the atmosphere can hold more water, leading to even more warming! This is what we call a positive feedback loop.

There you have it – the reality of the climate science.

Still curious or want more info? We got our information from the sources below.

Skeptical Science website www.skepticalscience.com

The Garnaut Review www.garnautreview.org.au

Climate Skepticism: The Top 10 BBC News. 12 November 2007
http://news.bbc.co.uk/2/hi/in_depth/629/629/7074601.stm

Climate change: a guide for the perplexed. New Scientist, 16 May 2007 by Michael Le Page
www.newscientist.com/article/dn11462-climate-change-a-guide-for-theperplexed.html

The Copenhagen Diagnosis, 2009: Updating the World on the Latest Climate Science.
www.copenhagendiagnosis.com

UQ Climate for Change is a group of students and staff at the University of Queensland who came together to raise awareness & generate action on issues of environmental sustainability, and most urgently, on climate change.

If you want to be involved, visit our website, <http://groups.google.com/group/uqclimateforchange>, come to our weekly meetings on 12pm Tuesdays under the trees in the Great Court, near the Goddard Building, or contact Jess Walsh on 0408 194 674.

