

IPCC climate trends: blueprints for tipping points in Earth's climate

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DISCLOSURE STATEMENT

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The IPCC reports are the most authoritative source of climate information we have. EPA/BERTIL ENEVAG ERICSON / TT SWEDEN OUT

The Intergovernmental Panel on Climate Change **Fifth Assessment Report**, authored by 209 lead authors, 50 review editors from 39 countries, and more than 600 contributing **authors from 32 countries**, with feedback from many hundreds of reviewers, is an authoritative summary of the scientific peer reviewed literature relating to climate science, global warming and future trends in the atmosphere-ocean system.

It is a document humanity can only ignore at its own peril.

There mean global warming of the atmosphere since 1850 reached about 0.9C (above pre-industrial). This translates to mean warming over the continents of **about 1.5C** and,

during 1986-2005, over 3C in **polar regions**. Once the masking effect of sulphur aerosols is discounted, the mean global climate has **already exceeded 2C**.

Warming of the ocean accounts for more than 90% of the extra energy absorbed by Earth during 1971-2010. The warming is directly related to the rise in radiative forcing/energy of the Earth system (see Figures 1 and 2). Temperature increases in ocean depths above 700m and below 700m are shown in Figure 3.

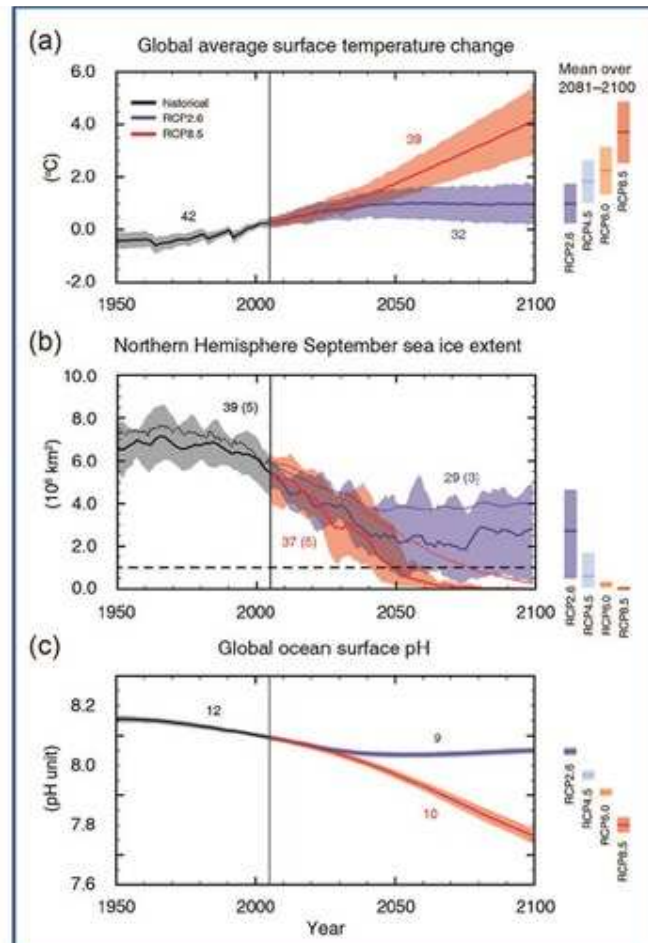


Figure 1: past and future climate trends (a) mean global temperature; (b) Northern Hemisphere sea ice extent; © ocean pH. IPCC - http://www.climatechange2013.org/images/uploads/WGIAR5-SPM_Approved27Sep2013.pdf

The AR5 report exposes the **myth** global warming has halted over the last 20 years or so. A **combination** of rising sulphur aerosol emissions from around 2001, a decline in sunspot activity and La-Nina events resulted in a relative lull in warming, while peak temperatures were reached in 2005 and 2010 and warming of the oceans continued (see Figure 3).

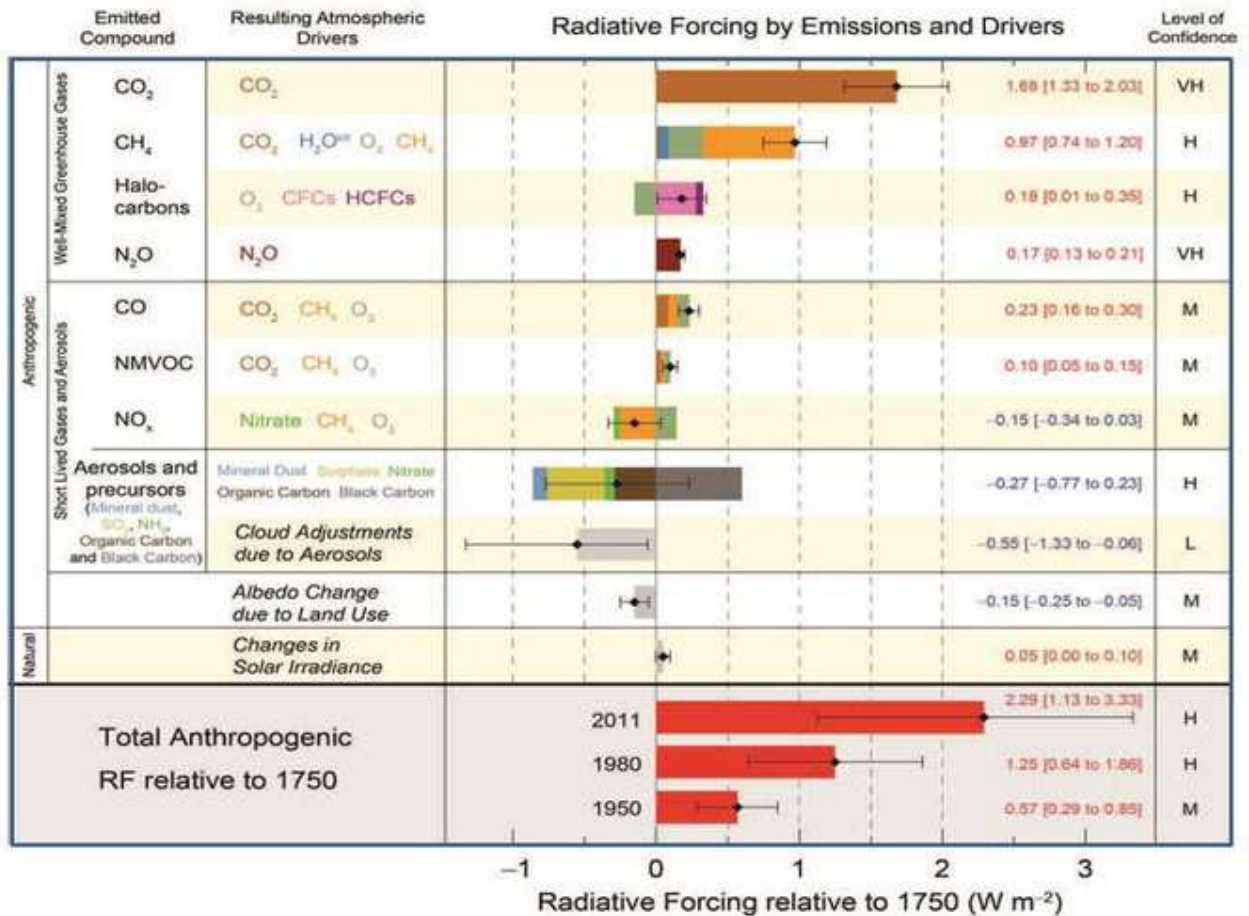


Figure 2: global mean positive and negative radiative forcings since 1750. Global average radiative forcing estimates and ranges for anthropogenic carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) and other important agents and mechanisms. The net anthropogenic radiative forcing and its range are also shown.

AR5 future climate projections may convey an impression future temperature rise can be expressed by smooth or gradual trajectories, as in Figure 1. Such a gradual rise might allow sufficient time to mitigate further warming. But the role of sulphur dioxide emissions in mitigating future temperature rise depends on industrial practices and thus remains unclear. Reduction in sulphur emissions associated with clean air policies resulted in temperature spikes about 1975, which could happen again.

The extreme rates of global warming experienced since about 1975 result in feedback effects from warming oceans, drying land sectors, release of methane from permafrost and Arctic lakes and release of CO₂ from fires. A continuation of these processes is bound to bring on a synergy of warming processes and potential irreversible tipping points in the climate system.

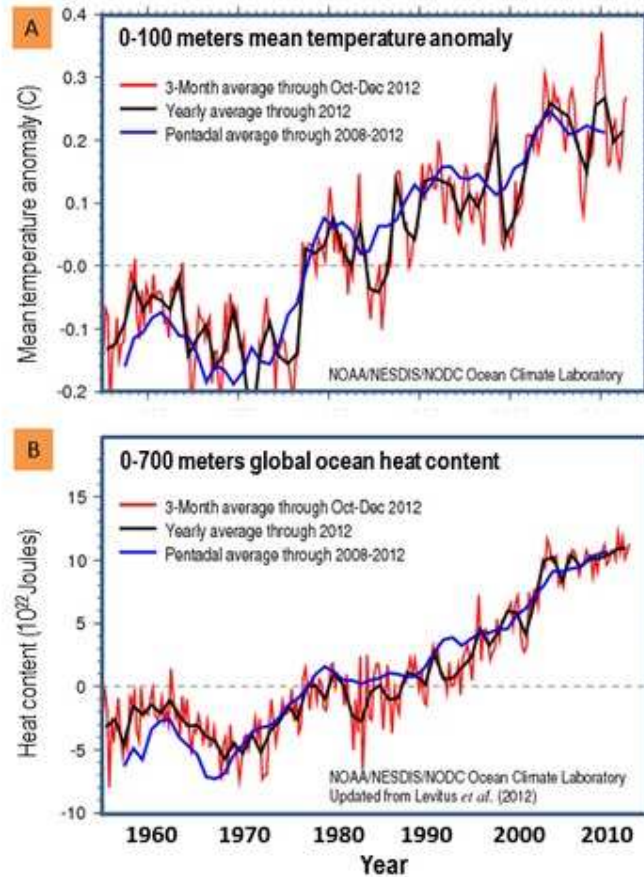


Figure 3: ocean temperatures and heat contents: a) 0–100 m depth mean temperature anomaly; b) 0–700 m depth global ocean heat content. zoomable= http://www.nodc.noaa.gov/OC5/3M_HEAT_CONTENT/index3.html

The rate at which climate forcing (change in energy/heat) in the atmosphere/ocean/cryosphere system rose between 1850-2005 (about 0.01 Watt/m²/year) is more than an order of magnitude faster than during the last glacial termination 17,000 – 10,000 years ago (about 0.00045 Watt/m²/year).

The lesson from the history of the atmosphere/ocean system is that abrupt climate changes at rates such as at present resulted in mass extinction of species. According to Kevin Trenberth, chief scientist of the National Center for Atmospheric Research in Boulder, Colorado:

Some of the human-induced changes are occurring 100 times faster than they occur in nature ... And this is one of the things that worries me more than climate change itself. It's actually the rate of change that's most worrying... Ecosystems are not prepared for this jolt ... And neither are many human endeavours, built around assumptions about how hot it's going to be, how much it's going to rain on our croplands, and how high the seas will rise.

The AR5 report says CO₂ or CH₄ release from thawing permafrost to 2010 are in the range of 33–400 gigatonnes of carbon. But not enough focus is drawn to this factor. **David Wasdell**, Director of the Meridian Institute, made this point earlier, stating: *The Feedback Crisis in Climate Change highlights the all-too-real possibility of runaway climate change, driven by the naturally occurring positive feedback loops of the biosphere. It raises issues of the most fundamental and urgent nature for the world community and calls in question the effectiveness of current strategic responses to global warming.*”

The role of fire as a major feedback to global warming has not received enough focus in the AR5 report. **According to** Professor of Environmental Change Biology, **David Bowman**, natural and anthropogenic forest and bushfires release 2 to 4 gigatonnes of carbon per year.

He says, “*Currently all sources of fire (landscape biomass) cause CO₂ emissions equal to 50% of those stemming from fossil-fuel combustion (2 to 4 PgC year⁻¹ versus 7.2 PgC year⁻¹)*”. With rising temperatures, a distinction between “natural” and “anthropogenic” fires is obscured. The AR5’s absence of focus on fire as a major feedback remains inexplicable.

Climate change in the 20th and 21st centuries constitutes an unprecedented **event horizon**— a shift of state in the terrestrial atmosphere. In a new paper **Hansen et al state** “Burning all fossil fuels, we conclude, would make most of the planet uninhabitable by humans, thus calling into question strategies that emphasize adaptation to climate change.”

No amount of media and internet spin can alter the essential evidence for runaway climate change presented by the AR5 report, nor the consequences for future generations and nature. Even before publication of the AR5 a loud chorus of critics emerged all over the media, none of whom are raising any valid scientific points.

As pointed out **by Andy Pitman**, those who deny the science will not indicate which evidence will convince them climate science and the IPCC are essentially correct. But for the rest of us, ignoring the evidence of AR5 would be imprudent in the extreme.

Good planets are hard to come by.