

# Positives and negatives of global warming

**What The Science Says:**
The negative impacts of global warming on agriculture, health, economy and environment far outweigh any positives.

**Climate Myth: It's not bad**
"Two thousand years of published human histories say that warm periods were good for people. It was the harsh, unstable Dark Ages and Little Ice Age that brought bigger storms, untimely frost, widespread famine and plagues of disease." (Dennis Avery)

The best way to put this in perspective is to compare the positives of global warming to the negatives (note - this list is by no means comprehensive - please feel free to suggest additional papers in the comments below):

## Positives

## Negatives

## Agriculture

- Improved agriculture in some high latitude regions (Mendelsohn 2006)
- Increased growing season in Greenland (Nyegaard 2007)
- Increased productivity of sour orange trees (Kimball 2007)

## Agriculture

- Decreasing human water supplies, increased fire frequency, ecosystem change and expanded deserts (Solomon 2009)
- Decline in rice yields due to warmer nighttime minimum temperatures (Peng 2004, Tao 2008)
- Increase of Western United States wildfire activity, associated with higher temperatures and earlier spring snowmelt (Westerling 2006)
- Encroachment of shrubs into grasslands, rendering rangeland unsuitable for domestic livestock grazing (Morgan 2007)
- Decreased water supply in the Colorado River Basin (McCabe 2007)
- Decreasing water supply to the Murray-Darling Basin (Cai 2008)

## Health

- Winter deaths will decline as temperatures warm (HPA 2007)

## Health

- Increased deaths to heatwaves - 5.74% increase to heatwaves compared to 1.59% to cold snaps (Medina-Ramon 2007)
- Increased heat stress in humans and other mammals (Sherwood 2010)
- Spread in mosquite-borne diseases such as Malaria and Dengue Fever (Epstein 1998)
- Increase in occurrence of allergic symptoms due to rise in allergenic pollen (Rogers 2006)

## Arctic Melt

- An ice-free Northwest Passage, providing a shipping shortcut between the Pacific and Atlantic Oceans (Kerr 2002, Stroeve 2008)

## Arctic Melt

- Loss of 2/3 of the world's polar bear population within 50 years (Amstrup 2007)
- Less compacted ice, hazardous floes and more mobile icebergs posing increased risk to shipping (IICWG 2009)
- Drying of arctic ponds with subsequent damage to ecosystem (Smol 2007)

Warming causes methane to escape from Arctic regions, contributing additional greenhouse warming. The following have been observed:

- Melting of Arctic lakes leading methane bubbling (Walter 2007)
- Leakage of methane from the East Siberian Shelf seabed sediments (Shakhova 2008)
- Escape of methane gas from the seabed along the West Spitsbergen continental margin (Westbrook 2009)

## Environment

- Increased vegetation activity in high northern latitudes (Zhou 2001)
- Increase in chinstrap and gentoo penguins (Ducklow 2006)
- Increased plankton biomass in the North Pacific Subtropical Gyre (arguably ENSO/PDO might be dominant influence) (Corno 2006)
- Recent increase in forest growth (McMahon 2010)
- Bigger marmots (Ozgul 2010)
- Increased Arctic tundra plant reproduction (Klady 2010)

## Environment

- Rainforests releasing CO2 as regions become drier (Saleska 2009)
- Extinction of the European land leech (Kutschera 2007)
- Decrease in Adélie penguin numbers (Ducklow 2006)
- Disruption to New Zealand aquatic species such as salmonids, stream invertebrates, fishes (Ryan 2007)
- Oxygen poor ocean zones are growing (Stramma 2008, Shaffer 2009)
- Increased mortality rates of healthy trees in Western U.S. forest (Pennisi 2009)
- More severe and extensive vegetation die-off due to warmer droughts (Breshears 2009)
- Increased pine tree mortality due to outbreaks of pine beetles (Kurz 2008, Bentz 2010)
- Increased risk of coral extinction from bleaching and disease driven by warming waters (Veron 2009, Carpenter 2008)
- Decline in lizard populations (Sinervo 2010)
- Decline in global phytoplankton (Boyce 2010)
- Decline in global net primary production - the amount of carbon absorbed by plants (Zhao 2010)

## Ocean Acidification

**Note:** this is not caused by warming temperatures but by the oceans absorbing more carbon dioxide (Dore 2009).

- Oceans uptake of carbon dioxide, moderates future global warming (Orr 2005)

## Ocean Acidification

- Substantial negative impacts to marine ecosystems (Orr 2005, Fabry 2008, Kroeker 2010)
- Inhibiting plankton development, disruption of carbon cycle (Turley 2005)
- Increased mortalities of sea urchins (Miles 2007)
- Threat to fish populations (Munday 2010)

## Glacier Melt

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- Severe consequences for at least 60 million people dependent on ice melt for water supply (Barnett 2005, Immerzeel 2010)
- Contribution to rising sea levels (Pfeffer 2008, Vermeer 2009)

## Economical

- Increased cod fishing leading to improved Greenland economy (Nyegaard 2007)

## Economical

- Economic damage to poorer, low latitude countries (Mendelsohn 2006)
- Billions of dollars of damage to public infrastructure (Larsen 2007)
- Reduced water supply in New Mexico (Hurd 2008)
- Increased risk of conflict (Zhang 2007) including increased risk of civil war in Africa (Burke 2009)
- Drop in primary productivity due to unprecedented warming at Lake Tanganyika (Tierney 2010)

## Sea Level Rise

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- Hundreds of millions displaced within this century (Dasgupta 2009)
- Coastal erosion in Nigeria (Okude 2006)

**Update July 2015**:

Here is a related lecture-video from Denial101x - Making Sense of Climate Science Denial

Additional video from the MOOC

Interviews with various experts

Skeptical Science explains the science of global warming and examines climate misinformation through the lens of peer-reviewed research. The website won the Australian Museum 2011 Eureka Prize for the Advancement of Climate Change Knowledge. Members of the Skeptical Science team have authored peer-reviewed papers, a college textbook on climate change and the book Climate Change Denial: Heads in the Sand. Skeptical Science content has been used in university courses, textbooks, government reports on climate change, television documentaries and numerous books.