



This is the print version of the [Skeptical Science](http://sks.to/icecollapse) article '[Greenland ice sheet won't collapse](http://sks.to/icecollapse)', which can be found at <http://sks.to/icecollapse>.

The past tells us Greenland's ice sheet is vulnerable to global warming

What The Science Says:

When Greenland was 3 to 5 degrees C warmer than today, a large portion of the Ice Sheet melted.

Climate Myth: Greenland ice sheet won't collapse

"A July 6, 2007 study published in the journal Science about Greenland by an international team of scientists found DNA "evidence that suggests the frozen shield covering the immense island survived the Earth's last period of global warming," according to a Boston Globe Article. ... [T]he study indicates "Greenland's ice may be less susceptible to the massive meltdown predicted by computer models of climate change, the main author ... said in an interview. ... The study found "Greenland really was green, before Ice Age glaciers enshrouded vast swaths of the Northern Hemisphere...somewhere between 450,000 and 800,000 years ago," according to the article. ([Marc Morano](#), discussing the views of Eske Willerslev)

Climate change skeptics like Marc Morano employ gross exaggeration to dismiss or diminish the potential disruption that climate change is likely to bring about. In the [Inhofe EWP press blog](#), Morano made much of this statement:

"...evidence that suggests the frozen shield covering the immense island survived the Earth's last period of global warming"

Irrespective of what it means to claim the ice sheet 'survived' (a rather unqualified claim since survival could be taken to mean that 99% or 1% of the ice was left), it is generally recognised that a complete melt-down of the Greenland ice sheet is far less likely than partial melting. The time-scales over which such a dramatic and complete failure could occur must also be reckoned in centuries rather than decades. Given how much uncertainty surrounds even the accurate measurement of negative mass balance (how much the ice is reducing per year), projections on the century scale are too speculative to be helpful when considering the current problem, which is sea level rise.

Sea level rise will depend on how much water is currently held in the Greenland ice sheet, because the sheer volume of water is so immense that even a small loss of ice will produce considerable rises in sea level – and concerns about loss of mass from ice sheets focuses on sea level rise because this is one of the most serious threats climate change may invoke.

So let's consider the ice sheets, individually and collectively. Estimates suggest that if the Greenland ice sheet was to melt away to nothing, sea levels would rise around 7 metres. To put that a different way, a loss of just one percent of the ice cap would result in a sea level rise of 7cm. Consider this in context: if the West Antarctic Ice Sheet (WAIS) were to melt, this would add around 6 metres to sea levels. If the East Antarctic Ice Sheet (EAIS) were to melt, seas would rise by around 70 metres. So a mere **1% loss** of ice from these three sources would produce a likely increase in sea levels of around 83cm - from these ice formations alone.

It is important when considering the impact of ice sheet mass balance to bear in mind that a global phenomenon like climate change will produce negative mass balance at both poles, and the shrinking glaciers will also contribute to sea level increases.

While the complete disappearance of Greenland's ice sheet is hard to predict and the probability lower than a partial collapse, it is clear that even a relatively small loss of ice through melting will produce considerable, and very disruptive, increases in sea levels.

Basic rebuttal written by [GPWayne](#)

Update July 2015:

Here is a related lecture-video from [Denial101x - Making Sense of Climate Science Denial](#)

[see video at [this link](#).]



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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.



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