



This is the print version of the [Skeptical Science](http://sks.to/seaice) article '[Arctic sea ice loss is matched by Antarctic sea ice gain](http://sks.to/seaice)', which can be found at <http://sks.to/seaice>.

## How does Arctic sea ice loss compare to Antarctic sea ice gain?

### What The Science Says:

Arctic sea ice loss is three times greater than Antarctic sea ice gain.

### Climate Myth: Arctic sea ice loss is matched by Antarctic sea ice gain

In fact, the global sea-ice record shows virtually no change throughout the past 30 years, because the quite rapid loss of Arctic sea ice since the satellites were watching has been matched by a near-equally rapid gain of Antarctic sea ice. Indeed, when the summer extent of Arctic sea ice reached its lowest point in the 30-year record in mid-September 2007, just three weeks later the Antarctic sea extent reached a 30-year record high. The record low was widely reported; the corresponding record high was almost entirely unreported. ([Chris Monckton](#))

Have Arctic ice losses truly been balanced by Antarctic gains? The first point to clarify is that we are talking about floating sea ice, not to be confused with land ice. Land ice at both poles and in glaciers around the world is [sliding into the ocean at an accelerating rate](#). This net loss of land ice is contributing to sea level rise.

However, Monckton is clearly referring to sea ice. The rapid decline of Arctic sea ice has indeed coincided with an increase in Antarctic sea ice. But do these two opposite trends cancel out as Monckton suggests? In reality, the upward Antarctic trend is only slight compared to the plummeting Arctic trend. [Tamino has crunched the numbers](#) and found the Arctic trend is in fact more than three times faster than the Antarctic one. The net result is a statistically significant global decrease of more than a million km<sup>2</sup> or a few percent – would you agree with Monckton that this is “virtually no change”?

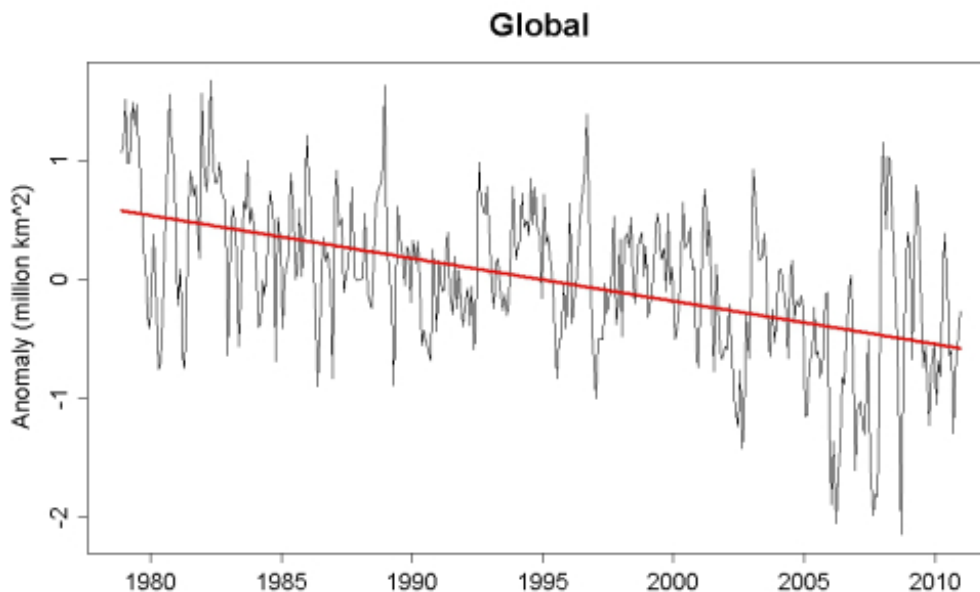


Figure 1: Global sea ice extent since 1979. (Image source: [Tamino](#). Data is from US [National Snow and Ice Data Center](#).)

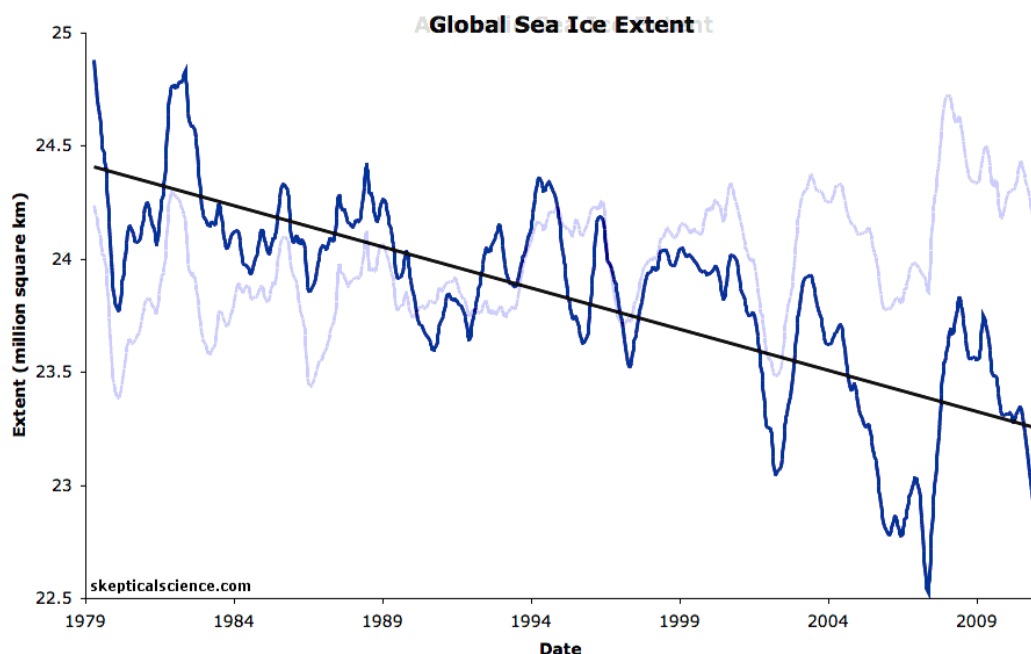


Figure 2: National Snow and Ice Data Center ([NSIDC](#)) Antarctic, Arctic, and global (sum of the two) sea ice extents with linear trends. The data is smoothed with a 12-month running average.

Sea ice area data [shows the same thing](#) as extent data.

## Summer and Winter, Apples and Oranges

Monckton compares the Arctic summer to the Antarctic winter, not the most appropriate comparison. Sea ice grows and shrinks seasonally because [polar latitudes have vastly more daylight hours in summer than in winter](#). When ice melts, it makes the surface less reflective and amplifies the warming ([as is currently occurring in the Arctic](#)), but this effect can only make a difference when the Sun is up. Thus the most important time of year for sea ice is its annual minimum which occurs at the end of the summer: September in the Arctic but February in the Antarctic.

So how do the two compare?

## Sea Ice Extent at Minimum Months

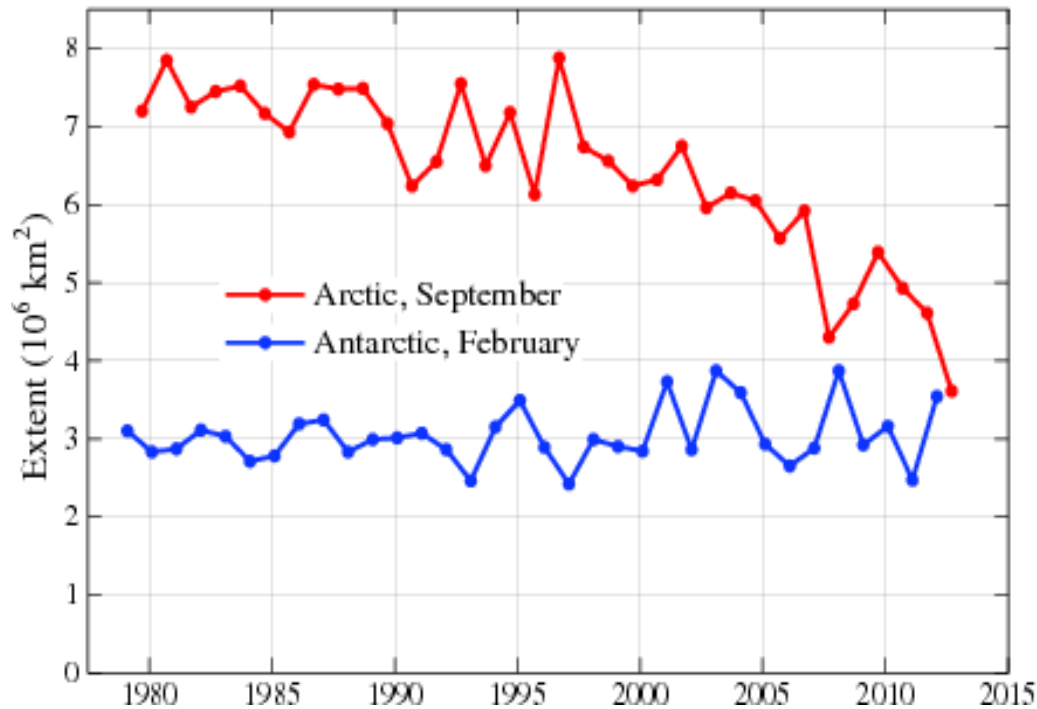


Figure 3: Minimum sea ice extent since 1979 in the Arctic and Antarctic. (Image source: [James Hansen](#). Data is from US [National Snow and Ice Data Center](#).)

While the summer Arctic has lost an extent of about 2.5 million km<sup>2</sup> (equivalent to the area of Western Australia), the summer Antarctic growth is only 0.3 million km<sup>2</sup> (about the size of Victoria). Even that slight upward trend is less than the year-to-year variability; although 2003 and 2008 tied for the highest February extent, 2006 was third lowest. Again, the real world contradicts Monckton's assertion that changes in the Arctic are being balanced out by the Antarctic.

### The Third Dimension

Furthermore, Monckton fails to mention that Arctic sea ice is not only shrinking in extent but also has been thinning rapidly. Although its lowest *extent* was in 2007, its *volume* has continued declining since then, hitting another record low in 2010:

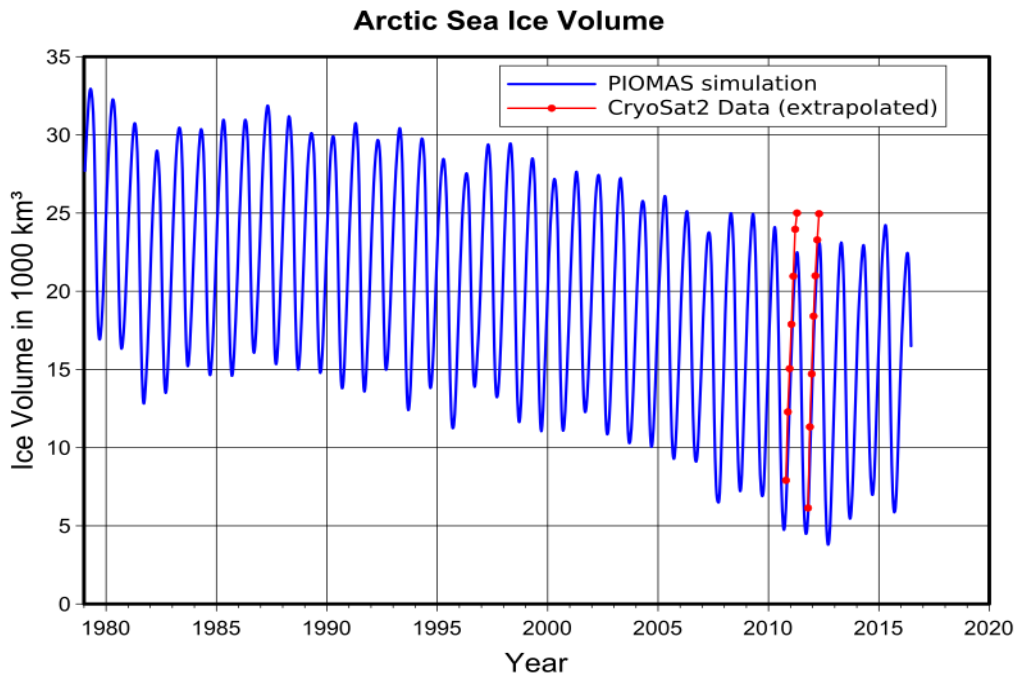


Figure 4: Arctic sea ice volume since 1979. (Image source: [Wikipedia](#). Based on data from [University of Washington Polar Science Center](#).)

The volume data is supported by a sharp decline in thick multiyear ice (Figure 5).

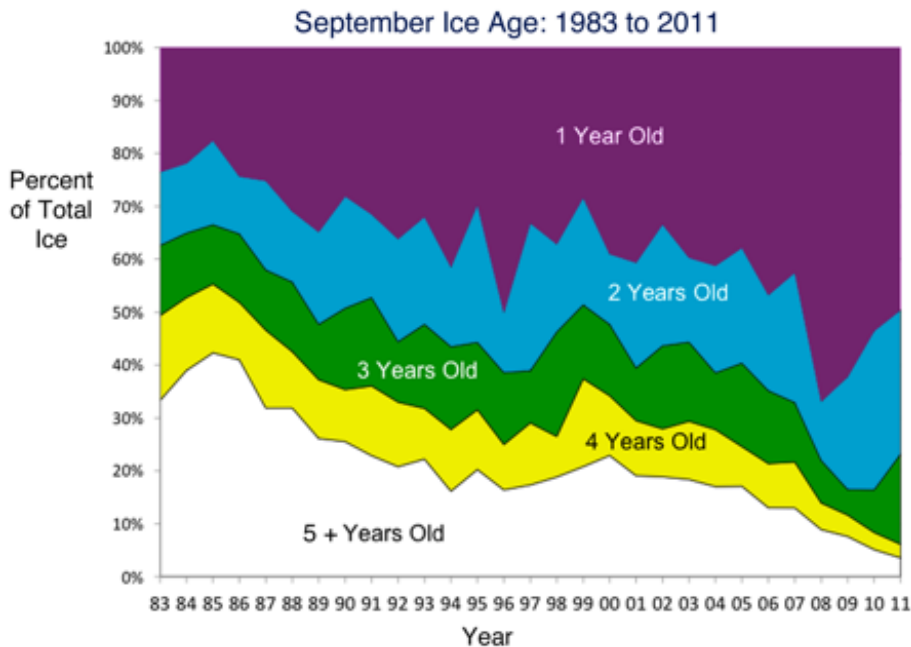


Figure 5: NSIDC Arctic sea ice age from 1983 through 2011 ([Source](#))

Meanwhile [there has been a slight increase](#) in Antarctic sea ice volume, but only by about 5,000 km<sup>3</sup> (insufficient to offset the Arctic decline shown in Figure 4), and most of it in a few years at the start of the record.

## The Polar Prognosis

As thinner and younger ice is easier to melt, the rapid Arctic melt is set to continue; [ice-free summers are now probably inevitable](#). In contrast, the Antarctic increase is occurring [despite the warming of the Southern Ocean](#) and is expected to reverse as the warming continues. Antarctic sea ice is just a distraction from the accelerating losses from ice sheets and the

looming specter of a sea-ice-free Arctic.

Basic rebuttal written by dana1981

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**Update July 2015:**

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

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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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