

The Polar Bear Catastrophe That Never Happened¹

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*Figure 1. A sow and her half-grown male cub feed on the ice near Svalbard, Norway.
Courtesy Shutterstock.*

Since the start of this century, polar bears have been an icon for all that's worrisome about human-caused global warming. Polar bears are the most-used example to try and convince the public that burning fossil fuels already has had - and will continue to have - a harmful effect on the planet. As we are told the Arctic is warming twice as fast as the rest of the planet, the polar bear is often called the 'canary in the coal mine' for climate change (Linden 2000; Richardson 2020; Siegle 2018).

Polar bears have gone from being threatened with (or 'vulnerable to') extinction by overhunting in 1973, saved in 1996, and threatened by climate change in 2006. The scientists who make up the Polar Bear Specialist Group (PBSG) of the International Union for the Conservation of Nature (IUCN) were pivotal to these conservation decisions (Crockford 2017, 2019).

In 2006, the opinion of PBSG members was that polar bear numbers would decline by 30 % or more within the next 45 years because of predicted future declines in summer sea ice (ACIA 2005; Aars et al. 2006; Hassol 2004). This was the first time that future threats based on climate models had been used to declare a species vulnerable to extinction by the IUCN: it was a watershed moment for animal conservation.

By 2007, American biologists at the US Geological Survey (USGS) folded suit (Adler 2008). The USGS used computer models that depended on the opinion of just one biologist – Steven Amstrup – regarding how polar bears would respond to projected summer sea ice changes. The focus was on summer ice because spring, fall and winter ice model projections showed no significant change by mid-century while those for summer ice showed a dramatic decline (Amstrup et al. 2007; Durner et al. 2007; Holland et al. 2007).

¹ The lecture can be watched here: <https://www.youtube.com/watch?v=FaayfgFLnb8> (Recorded by Yngvar Engebretsen).

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USGS biologists concluded that if summer sea ice declined as rapidly as predicted by mid century and stayed that low for at least eight out of ten years, a massive decline in polar bear numbers was inevitable. By 2050, summer sea ice was expected to drop 42 % below 1979 levels (i.e. less than about 5 million square km and a loss of 2/3 of the world's polar bears was anticipated (Amstrup et al. 2007; Courtland 2008; Hunter et al. 2007; USGS 2007). Given their starting estimate of about 24,500 bears, that meant only 8,100 were expected to survive: fewer bears than were thought by experts at the time to have existed in the late 1960s (Crockford 2019).

Unfortunately, summer sea ice unexpectedly dropped in September 2007 to less than 4 Mkm² (million square km,) a level that had not been predicted to occur until mid-century (Amstrup et al. 2008). USGS lead author Amstrup knew this fateful news by the time his report was published in early September (Amstrup et al. 2007) and explained that since the sea ice loss was worse than anyone had expected, the predictions he and his colleagues had made about polar bears were probably overly conservative: polar bear populations would likely decline sooner, or numbers drop even more dramatically than their models had predicted. Suddenly, the catastrophe was imminent, not decades away. Two years later, sea ice researchers stated summer sea ice loss was “at least 30 years” ahead of model predictions and concluded an ice-free Arctic by 2040 was quite likely (Wang and Overland 2009; see also Stroeve et al. 2007). In contrast, ice models used by polar bear biologists did not expect an ice-free Arctic until 2100 (Durner et al. 2007, 2009).

Contrary to expectations, however, the decline of summer ice did not get steadily worse: it stabilized (Swart et al. 2015). With the exception of two years when the September minimum was slightly above 5 Mkm², sea ice between 2007 and 2016 remained between 3 and 5 Mkm² (and indeed has remained in that range up to 2021) (NSIDC 2019, 2021). In other words, the dreaded mid-century threshold of sea ice levels – reached in at least eight out of ten years – had arrived decades before it was anticipated.

This set the stage for a hypothesis test. You don't have to put a collar on a polar bear to assess whether a prediction published in 2007 matched documented observations published in the scientific literature. While I explored whether the profound loss of summer sea ice in eight out of ten years had indeed caused a 67 % decline in polar bear numbers and the extirpation of more than half of all subpopulations, USGS polar bear biologists instead continued to promote a subsequent model projection that suggested the anticipated polar bear catastrophe could be avoided through a dramatic reduction of global greenhouse gas emissions (Amstrup et al. 2010).

I wrote a scientific paper showing that the global polar bear population had not declined in size – in fact it grew from about 24,500 in 2005 to about 28,500 in 2015 – an apparent 16 % increase despite the sudden and dramatic sea ice loss. Not a single subpopulation had been wiped out. The global population size increases (which grew further to about 30,000 in 2020) may not be statistically significant because of differences in methodology over time (both within and between subpopulation estimates), but there was certainly not a 67 % decline in polar bear numbers (Crockford 2017, 2019, 2021; Crockford and Geist 2018). Both the Arctic sea-ice and polar bear survival models were spectacularly wrong.

Today, there are fat healthy polar bears throughout the Arctic despite almost 50 % less ice than there was in 1979 (NOAA Oceans Today 2012; Scott and Hansen 2016; NSIDC 2021). For example, recent studies have shown that Chukchi Sea bears are in very good condition and reproducing well (Rode et al. 2014, 2018) and the population size was recently estimated at about 3,000: far higher than the estimate of 2,000 used for the 2015 IUCN assessment (Regehr et al. 2018; Wiig et al. 2015). Similarly, in the Barents Sea – where summer sea ice loss has been six times more pronounced than in Western Hudson Bay – polar bears in the late 2010s were found to be in better condition than they had been in the late 1990s and were reproducing well with good cub survival (Aars and Andersen 2021; Lippold et al. 2019; Regehr et al. 2016). Western Barents Sea polar bear numbers increased 42% between 2005 and 2015 but this was deemed ‘statistically insignificant’ (Aars et al. 2017).

Why were the USGS models so wrong? It came down to false assumptions and previously known facts that were ignored (Crockford 2017, 2019). For example, although spring sea ice conditions are

much more important than summer, the predictive models did not include a provision for the population size effects of periodic thick spring ice conditions, such as has been documented in the Southern Beaufort Sea and Hudson Bay. Also, we know from Western and Southern Hudson Bay data that bears well-fed in spring easily survive a 5-month summer fast, which means bears elsewhere in the Arctic must also have this capability whether they retreat to land or stay on the sea ice during the summer.

However, this was not information PBSG scientists wanted the public to know. In response, renowned Canadian polar bear specialist Ian Stirling, former USGS biologist Steven Amstrup (whose opinions about polar bear survival formed the basis of the 2007 prediction of catastrophe) teamed up with American climate scientist Michael Mann, Australian psychologist Stephan Lewandowsky, Dutch ecologist Jeff Harvey and nine other people to publish a defamatory paper denouncing my work (Harvey et al. 2018). Three press releases were issued, and the story was taken up by media outlets around the world, including the New York Times (Crockford 2018; Laframboise 2018). It was an organized attempt to silence legitimate scientific criticism.

The paper contained many egregious errors, and no effort was made to address any of the criticisms I had advanced regarding polar bear conservation: it accused me, through my popular blog (www.polarbearsience.com), of publishing misleading or error-filled information. Although the paper denigrated online blogs in general, it was a vindictive attack meant to publicly discredit me in particular. Judith Curry, Emeritus Professor of Earth and Atmospheric Sciences at Georgia Institute of Technology, spoke for many when she proclaimed it “...absolutely the stupidest paper I have ever seen published” (Curry 2017).

Meanwhile, my university was busy doing some silencing of its own. By the time the Harvey paper came out, I had already been expelled from the university’s Speakers Bureau based on a single complaint about my presentations to local schools in 2016. There was no right of appeal. Then, in late spring of 2019, my university department refused to renew my unpaid adjunct professor status, a position I had held for 15 years. The university has refused to answer any questions about these actions against me (Laframboise 2018, 2019; Laframboise and Crockford 2020): it was an academic hanging without a trial, conducted behind closed doors. Although their actions were entirely legal, it was nevertheless an unethical attack on my academic freedom.

Despite these setbacks, I continue to provide critical commentary regarding the biological health and conservation status of polar bears with regard to changing sea ice conditions (e.g. Crockford 2020, 2021).

Of particular concern is the continued obfuscation of global polar bear population sizes. Polar bear specialists suggest that polar bear numbers doubled between the late 1960s and 1996 but have stayed the same since. However, no other overhunted species has failed to continually increase its population size once protection from over-hunting was provided. I suggest numbers have continued to climb and that a plausible scientific estimate of the global total at 2018 was 39,000, with a range of 26,000-58,000 (Crockford 2017, 2019). Consider that in 1986, Canadian biologist Ian Stirling proposed there were probably about 40,000 polar bears in the world when he took into account areas without data, which included all of Russia (Crockford 2019:106). If that was true in 1986, 39,000 as an average in 2018, with a potential for 58,000 maximum, is likely a conservative estimate after more than 30 years of protection.

Conclusion

In conclusion, it is apparent that summer sea ice is not crucial for polar bear health and survival and that contrary to expectations, in some regions less summer ice than existed in the 1980s appears to be beneficial. Not only is there currently no ‘climate emergency’ for polar bears but the ‘canary in the coal mine’ of climate change turns out to be an outstanding survivor. No climate emergency for polar bears suggests there is no climate emergency period.

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