



TWENTY GOOD REASONS NOT TO WORRY ABOUT
POLAR BEARS

Susan Crockford

The Global Warming Policy Foundation

GWPF Briefing 14

GWPF REPORTS

Views expressed in the publications of the Global Warming Policy Foundation are those of the authors, not those of the GWPF, its Academic Advisory Council members or its directors

THE GLOBAL WARMING POLICY FOUNDATION

Director

Benny Peiser

BOARD OF TRUSTEES

Lord Lawson (Chairman)	Sir Martin Jacomb
Lord Donoughue	Baroness Nicholson
Lord Fellowes	Lord Turnbull
Rt Revd Dr Peter Foster, Bishop of Chester	Sir James Spooner

ACADEMIC ADVISORY COUNCIL

Professor Ross McKittrick(Chairman)	Professor Deepak Lal
Adrian Berry	Professor Richard Lindzen
Sir Samuel Brittan	Professor Robert Mendelsohn
Sir Ian Byatt	Professor Ian Plimer
Professor Robert Carter	Professor Paul Reiter
Professor Vincent Courtillot	Dr Matt Ridley
Professor Freeman Dyson	Sir Alan Rudge
Professor Christopher Essex	Professor Nir Shaviv
Christian Gerondeau	Professor Philip Stott
Dr Indur Goklany	Professor Henrik Svensmark
Professor William Happer	Professor Richard Tol
Professor David Henderson	Professor Fritz Vahrenholt
Professor Terence Kealey	Dr David Whitehouse

TWENTY GOOD REASONS NOT TO WORRY ABOUT
POLAR BEARS

Susan Crockford

Contents

About the author	1
Introduction	3
Twenty reasons	3
1 A conservation success story	3
2 Few populations in decline	3
3 Kara Sea population is growing	5
4 Chukchi Sea population is thriving	5
5 More prey means healthier polar bears	6
6 Polar bears are adaptable	6
7 Southern Beaufort numbers are rising too	7
8 Low sea ice in 2012 had no effect on Southern Beaufort bear numbers	7
9 Other species impacted by high polar bear numbers	7
10 Western Hudson populations are stable	9
11 Hudson Bay sea ice is not changing much	10
12 Problem bears in Churchill are not lean or starving	11
13 Churchill Manitoba had the most problem bears in 1983, not 2013	11
14 Marginal sea ice declines during the feeding period	11
15 No evidence that subsistence hunting is affecting bear populations	11
16 Stressful research methods have been curtailed	12
17 No recent reports of polar bear cannibalism	14
18 East Greenland bears appear unaffected by pollution	14
19 Polar bears have survived past warm periods	14
20 Polar bears are well distributed	14
Conclusion	15
Notes	17

About the author

Dr Susan Crockford is an evolutionary biologist and has been working for 35 years in archaeozoology, paleozoology and forensic zoology. She is an adjunct professor at the University of Victoria, British Columbia, but works full time for a private consulting company she co-owns (Pacific Identifications Inc). She is the author of *Rhythms of Life: Thyroid Hormone and the Origin of Species* and of an earlier briefing paper for GWPF on the subject of walrus haulouts.¹ She blogs at www.polarbearsience.com.

Introduction

Just in time for International Polar Bear Day (February 27), here's a new resource for cooling the polar bear spin. I've updated and expanded my previous summary of reasons not to worry about polar bears, which is now two years old.² In this new version, you will find links to supporting information, including previous blog posts of mine that provide background, maps and extensive references, although some of the most important graphs and maps have been reproduced here. I hope you find it a useful resource for refuting the spin³ and tuning out the cries of doom and gloom⁴ about the future of polar bears. Please feel free to share it.

This is the first anniversary of Canada providing population estimates and trends independent of the pessimistic prognostications of the IUCN/SSC Polar Bear Specialist Group (PBSG),⁵ so let's celebrate the recent triumphs and resilience of polar bears to their ever-changing Arctic environment.

Twenty reasons

1 A conservation success story

Polar bears are still a conservation success story.⁶ With a global population estimate almost certainly greater than 25,000, we can say for sure that there are more polar bears now than there were 40 years ago (Fig. 1).⁷ Sadly, although completing a global survey was one of the primary objectives of the PBSG at its inception 47 years ago, it has still not provided one. The current PBSG estimate is about 20,000–25,000 bears,⁸ although with several subpopulations still uncounted (Fig. 1),⁹ the actual figure is almost certainly a good deal higher (e.g. see Section 3).¹⁰ Even with this lack of precision, the global estimate is too high to qualify the polar bear as 'threatened' with extinction based on current population levels:¹¹ all of the concerns expressed regarding polar bears are about the future.¹²

2 Few populations in decline

The most recent status assessment for polar bears, published by Environment Canada in May 2014,¹⁴ shows only two subpopulations are 'likely in decline', down from four listed by the PBSG as declining in 2013 and seven in 2010 (Fig. 2).¹⁵ Baffin Bay earns its 'likely decline' status due to suspicions of over-harvesting (so far not confirmed), not sea ice decline.¹⁶ The assessment of the Southern Beaufort bear population is also highly questionable (see Section 7).

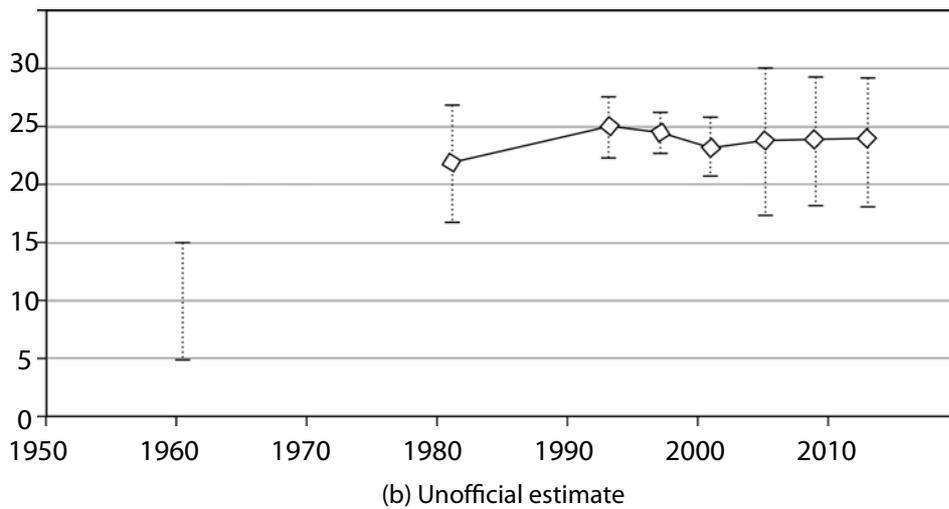
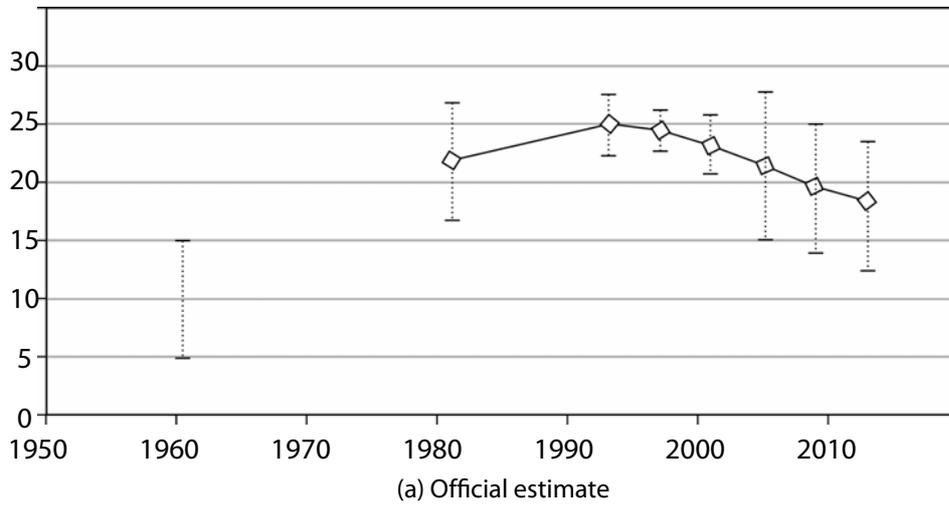


Figure 1: Estimates of polar bear numbers

Polar bear numbers in thousands. Upper graph uses totals reported in PBSG status tables (to 2013), with min/max; lower graph uses the same figures, but adds back in the so-called 'inaccurate' estimates dropped between 2005 and 2013 (in 2014, the PBSG finally did the same).¹³ The 1960 figure is a ballpark estimate. See <http://polarbearsociety.com/2014/02/18/graphing-polar-bear-population-estimates-over-time/> for original.

Twenty reasons

Note the improvement since 2010 (upper left) and even 2013 (lower left), with no declining populations (in red) noted in 2014. Note also the number of regions considered 'data deficient' (in brown). These have had no population survey or at least no recent one.

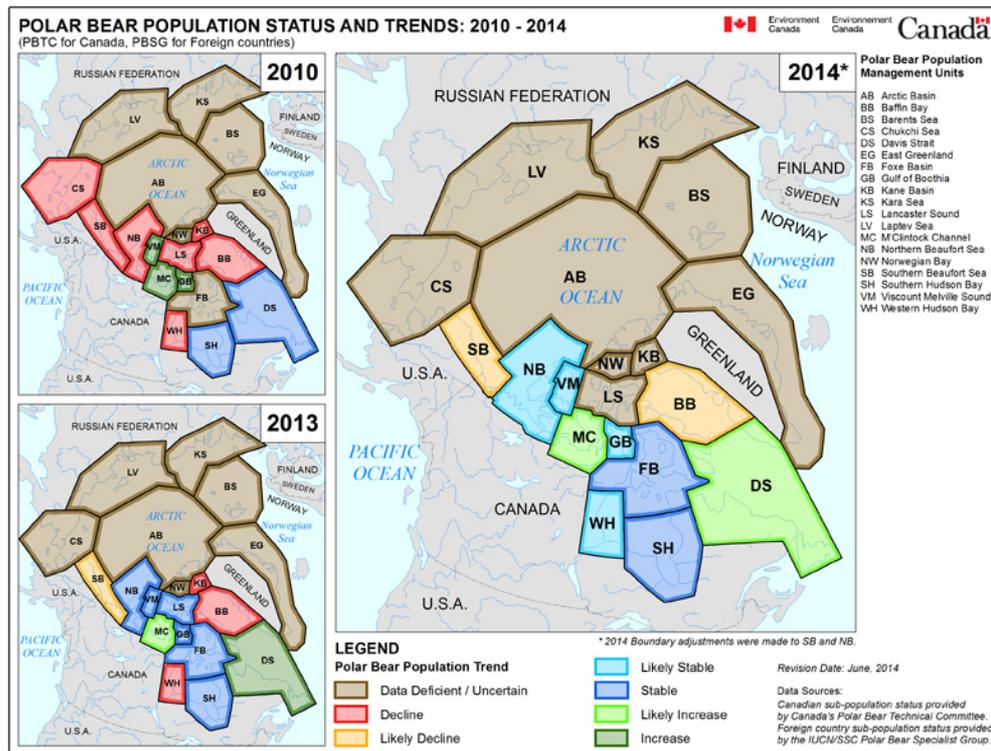


Figure 2: Most recent global polar bear population status assessment

Figures from the IUCN Polar Bear Specialist Group assessment (2013) and Environment Canada (May 2014).¹⁷ Brown, data deficient; red, declining; yellow, likely decline; light blue, likely stable; dark blue, stable; light green, likely increase; dark green, increase.

3 Kara Sea population is growing

A first-ever Kara Sea population estimate completed in late 2014 potentially adds another 3200 or so bears to the global total.¹⁸ This estimate (range 2,700–3,500), published by Russian biologists, has not yet been added to the official global count.

4 Chukchi Sea population is thriving

Polar bears in the Chukchi Sea are in good condition and reproducing well. The results of a new study were a direct contradiction of the repeated 'message' that recent large sea-ice declines in late summer had put these bears in peril.¹⁹ A paper published online in late summer of 2013 showed that Chukchi polar bears are doing better than they were in the 1980s,²⁰ and better than any others except the bears in Foxe Basin (northern Hudson Bay), who are doing exceptionally well.²¹

There is still no official population estimate for the Chukchi Sea: the population is officially listed as zero, but was previously estimated at about 2000 individuals. However, it appears that record-breaking sea ice levels in September 2007, the lowest to that date since 1979, had no discernible effect on Chukchi Sea polar bears.²² As a result, the status of this population was upgraded from 'declining' to 'data deficient' by the PBSG in 2013.²³ Despite the gloomy predictions, extra-low ice extent in late summer/early fall was actually better for Chukchi polar bears.²⁴

5 More prey means healthier polar bears

The reason Chukchi Sea polar bears did so well with an extended open-water season was because ringed seals, their primary prey, do most of their feeding in ice-free summer waters. More fat seals mean more fat seal pups the following spring for polar bears. A recent study found that in recent years, with extensive September sea-ice minimums, the summer feeding period for seals was extended and they became extra fat.²⁵ This meant that some seals provided a more energy-rich food source for polar bears over the following fall and winter, an immediate benefit to the bears. In addition, well-fed female ringed seals produced fat healthy pups the next spring, which meant more food for polar bears when they needed it the most.

Between 2008 and 2011, both ringed seals and polar bears did better than either had done in the 1980s when summer sea ice coverage was more extensive. Oddly, in March 2013, less than six months after ringed seals were placed on the American list of species 'threatened' with extinction,²⁶ ringed seal biologists were reporting to their peers that the results of their Chukchi Sea research contradicted their dire predictions.²⁷ Surprisingly to them, less summer sea ice was better for ringed seals, not worse. And in July 2014, a judge decreed that the 2012 decision to list bearded seals in Alaska as 'threatened' was deficient and that there were no near-term threats. The judge called it 'an abuse of discretion'.²⁸

The USA stands out as the only nation that insists that Arctic seals have been (or will be shortly) harmed by recent declines in summer sea ice, even though it has the least amount of sea ice habitat of all Arctic nations.²⁹

6 Polar bears are adaptable

Polar bears have been shown to move from areas with unsuitable ice to areas with better ice conditions, even over the short term. This is strong evidence of their ability to adapt to changing sea ice. Recently, it was noted that a number of bears from the Barents Sea, where sea-ice coverage is strongly influenced by variations in the Atlantic Multidecadal Oscillation,³⁰ moved to the islands of the Franz Josef Land archipelago in the Kara Sea, where there has been more predictable ice cover.³¹ This is just one example of polar bear flexibility. A past example was the movement of Southern Beaufort bears into the Chukchi Sea during the catastrophic 1974–1976 episode of thick spring ice in the Eastern Beaufort. Flexibility in choosing maternity dens (onshore vs sea ice),³² as well as variability in feeding areas (nearshore vs offshore), give polar bears the resilience they need to survive as a species.

7 Southern Beaufort numbers are rising too

According to a preliminary US Fish & Wildlife Service survey, Southern Beaufort bear numbers, were higher in 2012 than they had been in the previous ten years,³³ indicating a full recovery from the dramatic decline (25–50%) that occurred between 2004 and 2006 because of the effects of thick spring sea ice. For unknown reasons, the newly-developed models used to estimate Southern Beaufort population size used only data up until 2010, even though mark-recapture data up until 2012 were available.³⁴ This is known because the data was used for another study; see Section 8.

8 Low sea ice in 2012 had no effect on Southern Beaufort bear numbers

The dramatically low September sea ice of 2012 apparently had no effect on Southern Beaufort Sea polar bears, or at least we have heard nothing to indicate any adverse effects.³⁵ Even though 2012 had the longest open-water period in the Southern Beaufort since at least 1979 (see Fig. 3), researchers doing mark-recapture work in the area reported no starving bears during the summer of 2012 or in the spring of 2013.³⁶ Instead, an aerial survey conducted in the fall of 2012 reported that numbers were higher than they had been in a decade (see Section 7). That is because the extent of sea ice in early summer

and late fall means little to polar bears, in part because most bears eat very little then, even if they are on the ice.³⁷

9 Other species impacted by high polar bear numbers

There are so many polar bears in the Foxe Basin³⁸ and the southern Davis Strait³⁹ (Fig. 4) that they may be decimating some nesting sea bird colonies.⁴⁰ If so then this would represent a downside of there being too many bears. And in Western Hudson Bay, polar bears have been reported eating record numbers of caribou and snow geese because populations of these prey animals are higher than they have been in decades.⁴¹ Such welcome food sources for eastern Canadian bears provide a little relief from their summer fast, as whale carcasses do for western bears⁴² (such as those at Kaktovik⁴³ in the Beaufort Sea). However, all evidence suggests that such terrestrial foods are not necessary for bears that have fed well during the previous spring:⁴⁴ whether on land or out on the ice, most polar bears eat very little over the late summer/early fall months.

10 Western Hudson populations are stable

Western Hudson Bay polar bear numbers have stabilized.⁴⁵ Since 2004 they have not continued to decline as predicted, although a decline has been proclaimed as fact for the last few years by PBGS biologists.⁴⁶ In an internal government report, Canadian polar bear biologists found that if they used the same methods to analyze mark–recapture data collected in 1998–2004 as they did for data from 2004–2012, the population estimates are virtually identical.⁴⁷ In other words, there has been no further decline in numbers of polar bears in this area since 2004. You may still find people saying that there are only about 800 bears in the Western Hudson Bay, but that estimate was based on a misleading calculation: the official estimate is about 1000 bears, in agreement with a 2011 aerial survey.⁴⁸

11 Hudson Bay sea ice is not changing much

For the last three years, break-up dates for Western Hudson Bay have been average, at around July 1, or later. There has not been a late freeze-up since 2010, when it was delayed until early December.⁴⁹

This is based on criteria established by polar bear biologists in a paper published in 2013, which showed that for polar bears in Western Hudson Bay, breakup is best defined as the date of 30% ice coverage for that region (about 20% for the bay overall), while freeze-up occurs at about 10% for the region (5–10% for the bay overall).⁵⁰ All of this suggests that in Western Hudson Bay,

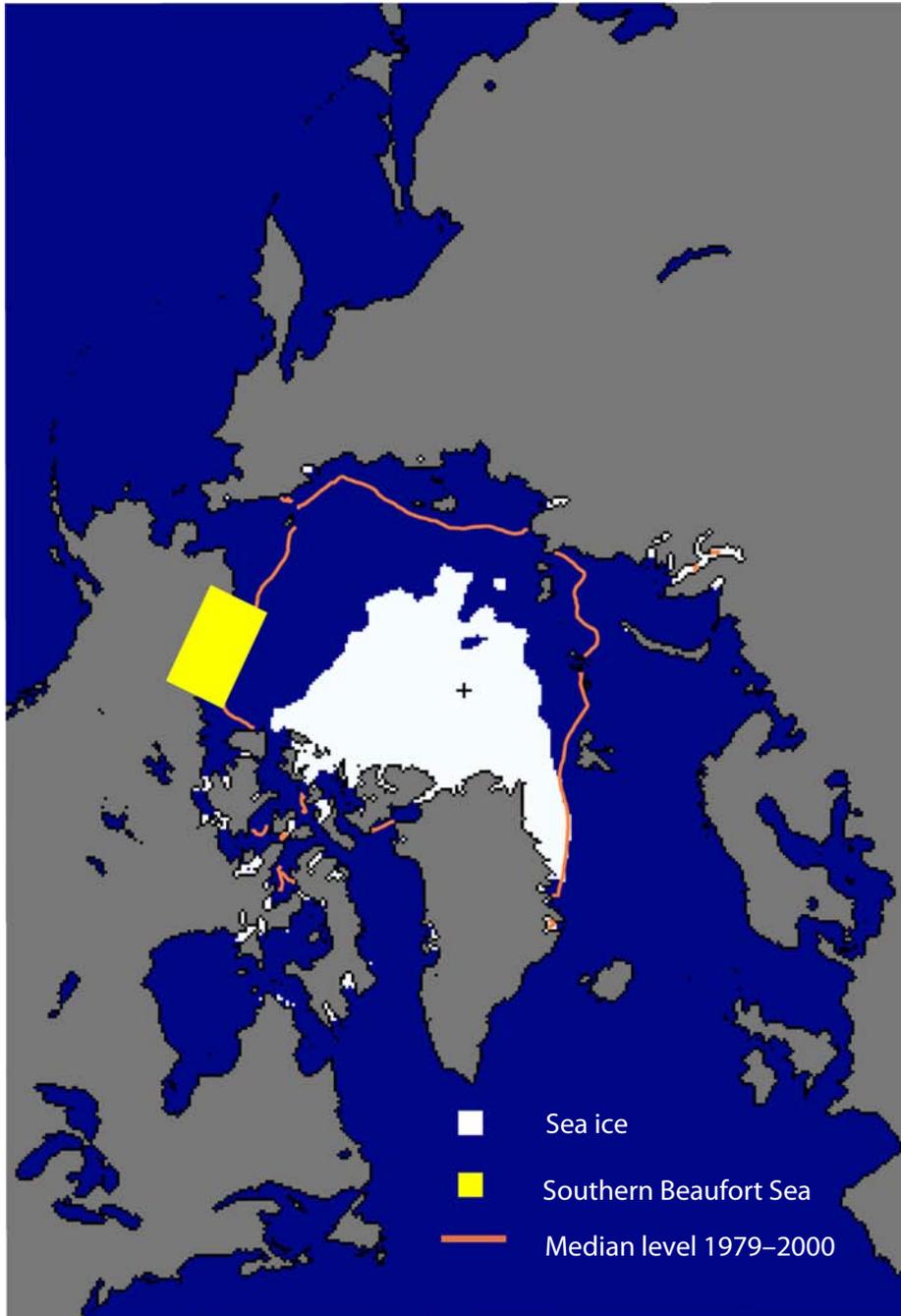


Figure 3: Sea ice extent at the 2012 late summer minimum

As at 16 September 2012. Source: NSIDC



Figure 4: Some polar bear assessment areas

SB, Southern Beaufort Sea; BB, Baffin Bay; FB, Foxe Basin; WH, West Hudson Bay; DS, Davis Strait.

some years have been good for polar bears and others have been not so good, but there has not been a relentless or precipitous decline in sea-ice breakup dates over the last thirty years. This has allowed polar bears there to adapt via natural selection.⁵¹

12 Problem bears in Churchill are not lean or starving

The Canadian Broadcasting Corporation produced a relatively balanced documentary about some of the controversies involved in polar bear conservation, called *The Politics of Polar Bears*.⁵³ It included an interview with the head conservation officer in Churchill, who noted that virtually none of the ‘problem bears’ (see Section 13) captured over the last five years were starving or lean. That suggests that many of the problems with polar bears that Western Hudson Bay communities have experienced in recent years are due to the higher number of bears – as predicted by Ian Stirling in the 1970s⁵⁴ – combined with other factors (such as increased numbers of residents and tourists). Sea ice changes are unlikely to be a cause.

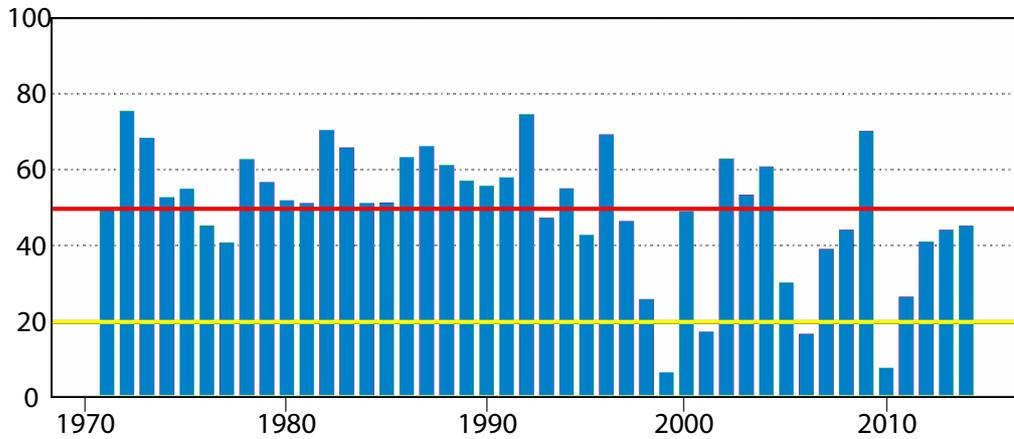


Figure 5: Sea ice coverage on Hudson Bay for the week of 2 July, 1971–2014

The red line is the 1981–2010 average; the yellow line indicates 20% ice coverage level for the entire bay. In most years, because of the way that ice melts on the bay, 20% ice coverage overall is a good approximation for 30% coverage in Western Hudson Bay (see text). Note how few years were at or below 20% by July 2: 1998, 1999, 2001, and 2006, 2010 and 2011 – six times over the last 44 years. Source: Canadian Ice Service.⁵²

13 Churchill Manitoba had the most problem bears in 1983, not 2013

The worst year for problem bears in Churchill that could be correlated with lack of sea ice was back in 1983, when the last human fatality from a polar bear attack occurred. Ironically, 1983 was a year when breakup of sea ice was later than usual, so the bears had more time on the ice to feed. Unfortunately, freeze-up was also much later than usual, leaving many bears in a very lean state.⁵⁵ While 2004 also had a high number of problem bears, there have been no published problem bear statistics compared to sea ice status since 2004. And while there were polar bear problems reported in 2013,⁵⁶ freeze-up was not late that year, nor was breakup early. Breakup and freeze-up dates for Western Hudson Bay are highly variable (see Section 11) and do not appear to correlate with high or low Arctic sea ice levels in September (Fig. 6).

14 Marginal sea ice declines during the feeding period

Across the Arctic, there has been only a marginal decline in total sea ice extent (Fig. 6) between March and June, the critical spring feeding period when polar bears require the ice as a hunting platform for gorging on young, fat seals. Polar bears consume two-thirds or more of their yearly food intake during this time: they generally eat little during the summer,⁵⁸ whether on land or on the

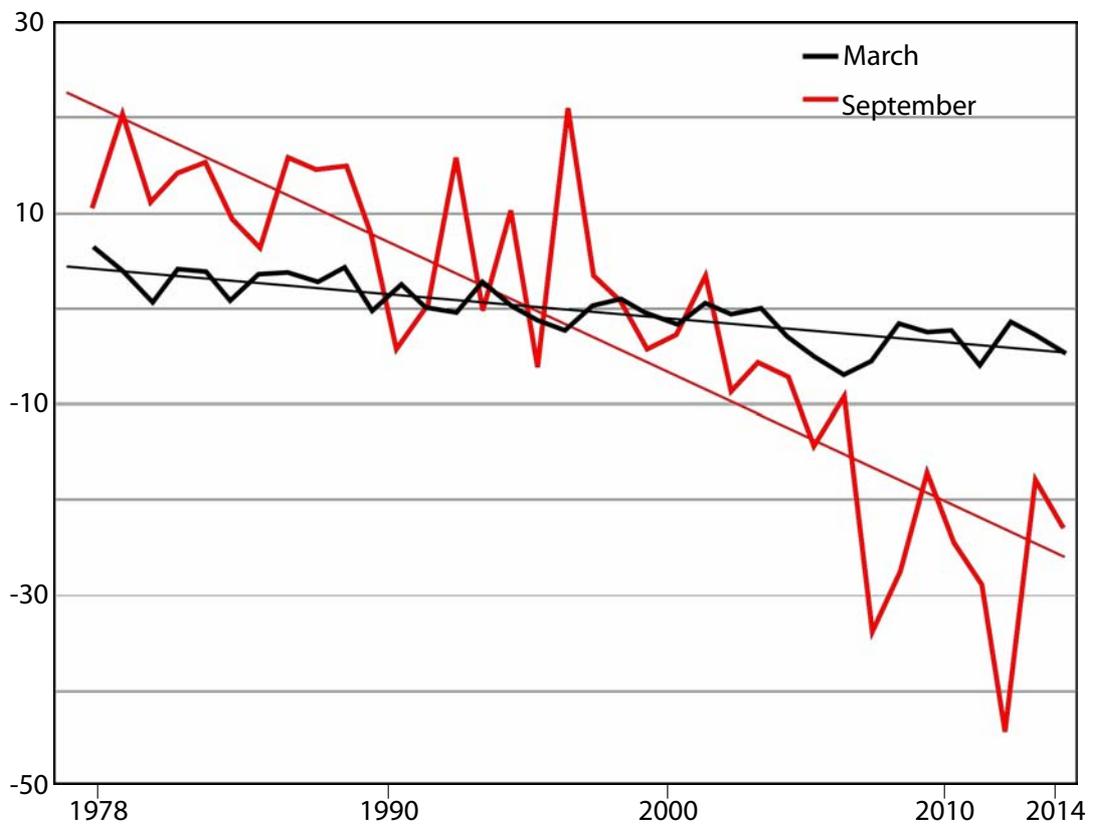


Figure 6: Arctic sea-ice levels 1978–2014

Source: NOAA's 'Arctic Report Card 2014'.⁵⁷ Note the lack of error bars indicating the estimated accuracy of each value, which should be present on a scientific graph.

ice. Feeding picks up again in the fall but declines over the winter, explaining why polar bears everywhere are leanest at the end of winter, just before Arctic seals pups are born.

15 No evidence that subsistence hunting is affecting bear populations

There is no plausible evidence that regulated subsistence hunting is causing polar bear numbers to decline, despite suspicions harboured by PBSG biologists. The one region where over-hunting is suspected, but not yet proven,⁵⁹ to have caused a difference to population numbers is in Baffin Bay.⁶⁰ However, results of the reportedly finalised population survey there has still not been released, although it was promised by the end of 2014.

16 Stressful research methods have been curtailed

Many polar bear biologists have stopped putting satellite radio collars on polar bears and have turned to other methods to gather population size data, a step that means less handling stress for the bears. In some regions, such as the Barents and Chukchi Seas, large-scale mark–recapture studies would be logistically impractical, although some small projects are conducted in the Barents Sea.⁶¹ In other areas, repeated capture, each involving a helicopter chase and use of tranquilizer guns, is seen by Arctic residents as stressful for the bears, especially females with young cubs. Also, the drug residues are potentially bad news for aboriginal hunters and their families, who eat the meat.⁶² Oddly, polar bear biologists chose to dispel the serious concerns over invasive research by presenting the outputs of computer models.⁶³

At the moment, in most regions of Canada with polar bears (Fig. 7), including Nunavut, the Northwest Territories and Quebec, permits are no longer being approved for mark-recapture work.⁶⁴ Invasive research does continue in other areas within Canada,⁶⁵ especially Western and Southern Hudson Bay, Labrador and Newfoundland, and beyond, particularly in the Southern Beaufort⁶⁶ and East Greenland.⁶⁷

17 No recent reports of polar bear cannibalism

There have been no further reports of polar bear cannibalism since at least 2011 and no reports of den collapses due to unusually warm winter or early-spring temperatures since 1990,⁶⁹ even though 2012 had the lowest summer ice extent since 1979. Even in regions where bears are reportedly under stress (e.g. Southern Beaufort, Western Hudson Bay, Barents Sea), we have not had any further reports of cannibalism⁷⁰ or den-collapse deaths, either through the media or in the published literature.

18 East Greenland bears appear unaffected by pollution

So-called ‘toxic’ chemicals that cycle from human use into the environment move up the food chain, especially through animal fat. As top Arctic predators that consume lots of fat, polar bears have the potential to retain more of these toxins than other animals.

East Greenland bears appear to be the most ‘polluted’ of all polar bears tested so far,⁷¹ yet they seem to be doing well. Even their penis bones are holding up:⁷² reports that polar bear penis bones have been breaking due to weakening bone structure due to retained toxic environmental chemicals have sensationalized the original report,⁷³ which only said the bones could *perhaps* break.



Figure 7: Polar bear research regimes in Canada

Red: permits no longer issued; green: mark-recapture still permitted.⁶⁸

19 Polar bears have survived past warm periods

One of the most recent genetic studies published emphasized that polar bears, as a species, survived more than one previous warm period when there was virtually no summer sea ice.⁷⁴ Sea ice has varied both over the short term (i.e. decades-long climate oscillations) and the long term (glacial-to-interglacial cycles of thousands of years). Over the last 100,000 years, for example, there have been periods of much less ice than today, but also periods with much, much more. Polar bear population numbers probably fluctuated up and down in conjunction with these sea ice changes but the polar bear as a species survived, and so did all of the Arctic seal species they depend on for food, including Pacific walrus (a species limited by food,⁷⁵ not sea ice). Their survival indicates that these Arctic species, in an evolutionary sense, are very well-adapted to their highly-variable habitat,⁷⁶ despite their low genetic diversity.⁷⁷

20 Polar bears are well distributed

Polar bears today are well distributed throughout their available habitat (winter sea ice), which is a recognized characteristic of a healthy species. While there has recently been a suggestion of a putative 'range contraction' of polar bears due to sea ice declines, the authors offered only changes in seasonal use to support their claim, not the total abandonment of former territory that is meant by the term 'range contraction'.⁷⁸ Polar bear territory is still pretty well defined by the maximum extent of Arctic sea ice in March.

Conclusion

These are all good reasons to feel good about the current status of the polar bear. Polar bears are not currently threatened⁷⁹ with extinction due to declining sea ice, despite the hue and cry from activist scientists⁸⁰ and environmental organizations.⁸¹ Indeed, because the polar bear is doing so well, those who would like to see polar bears listed as 'vulnerable' on the IUCN Red List are depending entirely upon prophecies of declines in summer sea ice decades from now⁸² to make their case.⁸³ The truth is that right now polar bears are doing well despite dramatic declines in summer sea ice, for one simple reason: polar bears don't need ice in late summer/early fall as long as they are well-fed in the spring.

Notes

1. Crockford, S. On the Beach. GWPf briefing 11.<http://www.thegwpf.org/susan-crockford-on-the-beach/>.
2. <http://polarbearscience.com/2013/02/26/ten-good-reasons-not-to-worry-about-polar-bears/>.
3. http://www.oregonlive.com/environment/index.ssf/2015/02/oregon_zoo_expert_polar_bears.html.
4. <http://www.dailymail.co.uk/sport/tennis/article-2956871/Eugenie-Bouchard-posts-selfie-Instagram-promote-International-Polar-Bear-Day.html>.
5. <http://pbsg.npolar.no/en/>.
6. <http://polarbearscience.com/2015/01/01/iucn-polar-bear-specialist-group-out-lived-its-usefulness-20-years-ago/>.
7. <http://polarbearscience.com/2014/02/18/graphing-polar-bear-population-estimates-over-time/>.
8. <http://pbsg.npolar.no/en/status/>.
9. <http://polarbearscience.com/2014/05/30/iucn-polar-bear-specialist-group-says-its-global-population-estimate-was-a-qualified-guess/>.
10. <http://polarbearscience.com/2014/08/05/dodgy-new-clarification-of-global-polar-bear-population-estimate-yes-another/>.
11. <http://polarbearscience.com/2014/07/05/are-polar-bears-really-endangered/>.
12. <http://www.bbc.com/earth/story/20141107-will-polar-bears-become-extinct>.
13. <http://polarbearscience.com/2014/12/19/challenging-noaas-arctic-report-card-2014-on-polar-bears/>.
14. https://www.ec.gc.ca/nature/default.asp?lang=En&n=F77294A3-1#_fig04.
15. <http://polarbearscience.com/2014/10/28/status-of-canadian-polar-bear-populations-has-been-changed-more-good-news/>.
16. <http://polarbearscience.com/2014/10/28/status-of-canadian-polar-bear-populations-has-been-changed-more-good-news/>.
17. https://www.ec.gc.ca/nature/default.asp?lang=En&n=F77294A3-1#_fig04.
18. <http://polarbearscience.com/2014/12/30/kara-sea-first-ever-polar-bear-count-suggests-about-3200-bears-live-there/>.
19. <http://polarbearscience.com/2013/07/07/chukchi-polar-bear-status-contradicts-the-message-new-details/>.
20. <http://polarbearscience.com/2013/09/08/how-and-why-great-news-about-chukchi-polar-bears-has-been-suppressed/>.
21. <http://polarbearscience.com/2014/02/12/foxe-basin-polar-bear-status-another-stable-population/>.
22. <http://polarbearscience.com/2013/09/15/record-sea-ice-loss-in-2007-had-no-effect-on-polar-bears-chukchi-study-confirms/>.

23. https://polarbearsience.files.wordpress.com/2014/02/summary-of-polar-bear-population-status-per-2013-pbsg_npolar_no_en_status_status-table_htm_feb-14-2014.pdf.
24. <http://polarbearsience.com/2015/01/12/if-summer-ice-was-critical-for-s-beaufort-polar-bears-2012-would-have-decimated-them/>.
25. <http://polarbearsience.com/2013/07/11/chukchiberling-sea-ringed-seals-doing-better-despite-declines-in-ice-and-snow-new-study/>.
26. <http://polarbearsience.com/2012/12/30/bearded-and-ringed-seals-join-the-polar-bear-as-threatened-by-a-computer-modeled-future/>.
27. <http://polarbearsience.com/2013/07/11/chukchiberling-sea-ringed-seals-doing-better-despite-declines-in-ice-and-snow-new-study/>.
28. <http://polarbearsience.com/2014/07/27/bearded-seals-in-alaska-face-no-serious-threat-of-reduction-let-alone-extinction-judge-rules/>.
29. <http://polarbearsience.com/2014/12/31/threatened-arctic-species-comparison-shows-usa-most-assertive-about-global-warming/>.
30. <http://polarbearsience.com/2014/03/10/barents-sea-polar-bear-condition-varies-with-amo-and-spring-sea-ice-conditions/>.
31. <http://polarbearsience.com/2014/04/14/polar-bears-move-around-as-sea-ice-habitat-changes-this-is-what-resilience-looks-like/>.
32. <http://polarbearsience.com/2014/08/20/summer-sea-ice-melt-and-polar-bear-maternity-dens/>.
33. https://polarbearsience.files.wordpress.com/2014/03/usfws-2013-2014-polar-bear-newsletter_sm.pdf; see p. 17 lower right. See also <http://polarbearsience.com/2014/11/19/polar-bear-researchers-knew-s-beaufort-population-continued-to-increase-up-to-2012/>.
34. <http://polarbearsience.com/2014/12/17/recent-s-beaufort-polar-bear-count-was-a-cherry-picked-result-new-evidence/>.
35. <http://polarbearsience.com/2015/01/12/if-summer-ice-was-critical-for-s-beaufort-polar-bears-2012-would-have-decimated-them/>.
36. <http://www.usgs.gov/newsroom/article.asp?ID=4075#.VJCA2Xt5Yvy>.
37. <http://polarbearsience.com/2015/02/09/polar-bears-out-on-the-sea-ice-eat-few-seals-in-summer-and-early-fall/>.
38. <http://polarbearsience.com/2014/02/12/foxe-basin-polar-bear-status-another-stable-population/>.
39. <http://polarbearsience.com/2013/06/10/signs-that-davis-strait-polar-bears-are-at-carrying-capacity/>.
40. <http://polarbearsience.com/2014/02/09/thriving-foxe-basin-and-davis-strait-polar-bears-threaten-nesting-sea-birds/>.
41. <http://polarbearsience.com/2014/01/26/churchill-polar-bears-eat-more-caribou-and-geese-now-than-in-1968-because-there-are-more-caribou-and-geese-new-research-reveals/>.

Twenty reasons

42. <http://polarbearscience.com/2013/12/13/kaktovik-polar-bear-photos-again-no-starving-bears/>.
43. <http://polarbearscience.com/2013/09/30/polar-bears-at-kaktovik-alaska-not-stranded-due-to-retreating-ice/>.
44. <http://polarbearscience.com/2015/02/09/polar-bears-out-on-the-sea-ice-eat-few-seals-in-summer-and-early-fall/>.
45. <http://polarbearscience.com/2014/12/05/western-hudson-bay-polar-bear-population-is-stable-press-release/>.
46. <http://www.theguardian.com/environment/2013/nov/27/polar-bears-climate-change-canada-hudson-bay>.
47. <http://polarbearscience.com/2014/12/19/challenging-noaas-arctic-report-card-2014-on-polar-bears/>.PDF available at <https://polarbearscience.files.wordpress.com/2014/12/wh-ec-polar-bear-demography-report-lunn-26-nov-2013-final.pdf>.
48. <http://polarbearscience.com/2014/07/15/w-hudson-bay-mark-recapture-studies-of-polar-bears-were-invalid-says-peer-reviewed-study/>.
49. <http://polarbearscience.com/2013/11/22/hudson-bay-freeze-up-has-not-been-a-day-later-each-year-since-1981/>.
50. Discussed at <http://polarbearscience.com/2013/03/21/polar-bears-of-w-hudson-bay-came-ashore-in-2009-as-late-as-in-1992/> and <http://polarbearscience.com/2014/07/10/breakup-date-average-for-w-hudson-bay-is-july-1-this-year-its-late-again/>.
51. <http://polarbearscience.com/2014/09/30/natural-selection-helps-polar-bears-adapt-to-sea-ice-variability-which-means-some-bears-die/>.
52. <http://tinyurl.com/pvjxyn>. Accessed 25 February 2015.
53. The long version of the program can be viewed online at <http://www.cbc.ca/player/Shows/Shows/Absolutely+Canadian/Absolutely+Manitoba/ID/2505861208/>, and a shorter (30 minute) version at <http://www.cbc.ca/news/technology/polar-bears-threatened-species-or-political-pawn-1.2753645>. See also <http://www.cbc.ca/news/technology/polar-bears-threatened-species-or-political-pawn-1.2753645>.
54. <http://polarbearscience.com/2013/11/17/human-polar-bear-conflicts-stirling-1974-vs-amstrup-2013/>.
55. <http://polarbearscience.com/2014/10/15/churchill-problem-bears-and-early-breakup-dates-in-whb-the-1983-2004-anomalies/>.
56. <http://polarbearscience.com/2013/11/19/polar-bear-problems-in-n-hudson-bay-not-due-to-late-freeze-up/>.
57. http://www.arctic.noaa.gov/reportcard/sea_ice.html. See also discussion at <http://polarbearscience.com/2014/12/19/challenging-noaas-arctic-report-card-2014-on-polar-bears/>.

58. <http://polarbearsience.com/2015/02/09/polar-bears-out-on-the-sea-ice-eat-few-seals-in-summer-and-early-fall/>.
59. <http://polarbearsience.com/2014/02/27/foxe-basin-aerial-survey-a-watershed-moment-for-polar-bear-research-part-2/>.
60. <http://polarbearsience.com/2013/11/11/baffin-bay-polar-bear-population-survey-done-results-due-end-2014/>.
61. <http://polarbearsience.com/2014/06/02/barents-sea-polar-bear-cubs-new-data-for-2014-made-to-sound-ominous/>.
62. <http://polarbearsience.com/2014/02/26/tranquilizing-polar-bears-and-meat-tainted-with-drugs/>.
63. <http://polarbearsience.com/2014/12/18/polar-bear-biologists-miss-the-mark-in-new-study-on-invasive-mark-recapture-effects/>.
64. Discussed at <http://polarbearsience.com/2014/02/24/foxe-basin-aerial-survey-a-watershed-moment-for-polar-bear-research-part-1/> and <http://polarbearsience.com/2014/02/27/foxe-basin-aerial-survey-a-watershed-moment-for-polar-bear-research-part-2/>.
65. <http://polarbearsience.com/2014/03/02/guest-post-invasive-research-is-alive-and-well-in-canada/>.
66. <http://polarbearsience.com/2013/08/29/ten-out-of-ten-polar-bears-being-tracked-this-summer-in-the-beaufort-sea-are-on-the-ice/>.
67. <http://polarbearsience.com/2015/02/04/east-greenland-polar-bears-said-to-be-the-most-polluted-but-appears-to-be-doing-just-fine/>.
68. <http://polarbearsience.com/2014/02/27/foxe-basin-aerial-survey-a-watershed-moment-for-polar-bear-research-part-2/>.
69. <http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2486.2012.02753.x/abstract>.
70. <http://polarbearsience.com/2013/04/10/cannibalism-in-polar-bears-spin-and-misrepresentation-of-fact-galore/>.
71. <http://polarbearsience.com/2015/02/04/east-greenland-polar-bears-said-to-be-the-most-polluted-but-appears-to-be-doing-just-fine/>.
72. <http://polarbearsience.com/2015/01/28/polar-bear-penises-not-breaking-due-to-pcbs-new-paper-full-of-coulds-and-maybes/>.
73. <http://grist.org/list/we-are-literally-breaking-polar-bear-penises-now/>.
74. <http://polarbearsience.com/2014/03/17/new-genetic-study-confirms-polar-bears-survived-several-warm-interglacials/>.
75. <http://polarbearsience.com/2014/10/23/walrus-mass-haulout-hype-refuted-the-video/>.
76. <http://polarbearsience.com/2014/09/30/natural-selection-helps-polar-bears-adapt-to-sea-ice-variability-which-means-some-bears-die/>.
77. <http://polarbearsience.com/2014/07/22/low-genetic-diversity-will-not-make-polar-bears-more-vulnerable-to-extinction/>.

Twenty reasons

78. <http://polarbears.com/2015/01/28/claim-of-range-contraction-of-polar-bears-due-to-declines-in-summer-sea-ice-doesnt-hold-up/>.
79. <http://www.bbc.com/earth/story/20141107-will-polar-bears-become-extinct>.
80. <http://polarbears.com/2013/12/29/another-unsupported-claim-of-starving-polar-bears-in-western-hudson-bay/>.
81. <http://polarbears.com/2014/06/18/center-for-biological-diversity-provides-a-public-disservice-on-polar-bear-status/>.
82. <http://polarbears.com/2014/07/29/sea-ice-experts-make-astonishing-admissions-to-polar-bear-specialists/>.
83. <http://polarbears.com/2014/11/29/amstrup-knows-his-polar-bear-predictions-are-flawed-but-continues-to-promote-them/>.

GWPF BRIEFINGS

1	Andrew Turnbull	The Really Inconvenient Truth or 'It Ain't Necessarily So'
2	Philipp Mueller	The Greening of the Sahel
3	William Happer	The Truth about Greenhouse Gases
4	Gordon Hughes	The Impact of Wind Power on Household Energy Bills
5	Matt Ridley	The Perils of Confirmation Basis
6	Philipp Mueller	The Abundance of Fossil Fuels
7	Indur Goklany	Is Global Warming the Number One Threat to Humanity?
8	Andrew Montford	The Climate Model and the Public Purse
9	Philipp Mueller	UK Energy Security: Myth and Reality
10	Andrew Montford	Precipitation, Deluge and Flood
11	Susan Crockford	On the Beach
12	Madhav Khandekar	Floods and Droughts in the Indian Monsoon
13	Indur Goklany	Unhealthy Exaggeration
14	Susan Crockford	Twenty Reasons not to Worry about Polar Bears

The Global Warming Policy Foundation is an all-party and non-party think tank and a registered educational charity which, while openminded on the contested science of global warming, is deeply concerned about the costs and other implications of many of the policies currently being advocated.

Our main focus is to analyse global warming policies and their economic and other implications. Our aim is to provide the most robust and reliable economic analysis and advice. Above all we seek to inform the media, politicians and the public, in a newsworthy way, on the subject in general and on the misinformation to which they are all too frequently being subjected at the present time.

The key to the success of the GWPF is the trust and credibility that we have earned in the eyes of a growing number of policy makers, journalists and the interested public. The GWPF is funded overwhelmingly by voluntary donations from a number of private individuals and charitable trusts. In order to make clear its complete independence, it does not accept gifts from either energy companies or anyone with a significant interest in an energy company.

Views expressed in the publications of the Global Warming Policy Foundation are those of the authors, not those of the GWPF, its trustees, its Academic Advisory Council members or its directors.

Published by the Global Warming Policy Foundation

For further information about GWPF or a print copy of this report, please contact:

The Global Warming Policy Foundation
10 Upper Bank Street, London E14 5NB.
T 020 7006 5827
M 07553 361717



www.thegwpf.org

Registered in England, No 6962749
Registered with the Charity Commission, No 1131448