

## SNAPSHOT

## The polar bear struggle

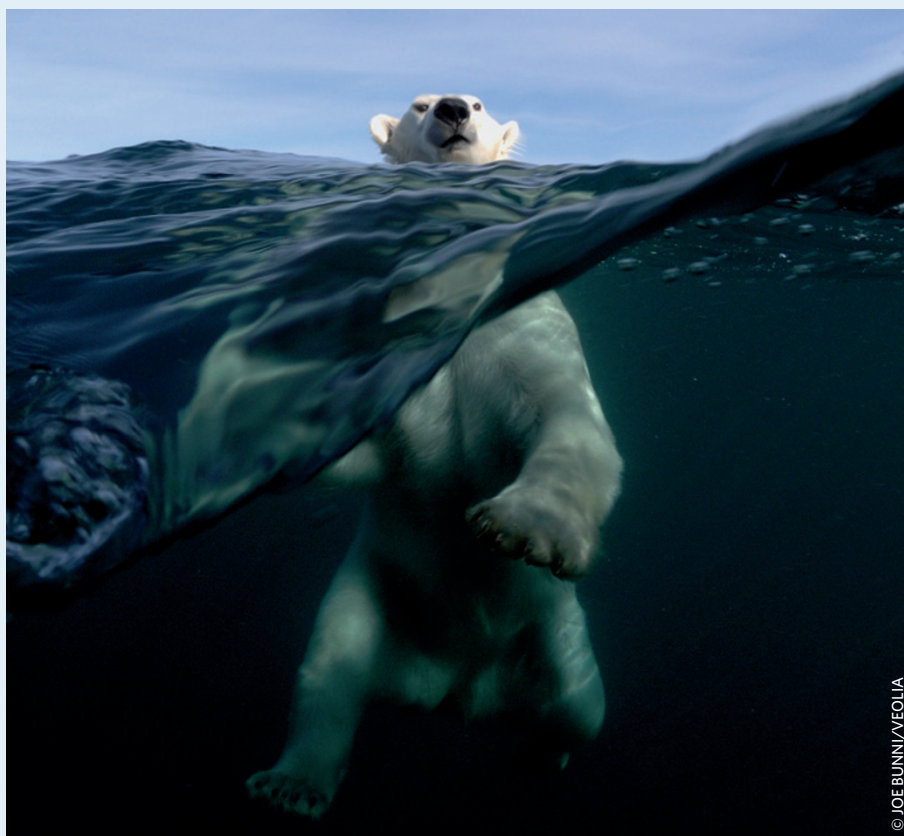
Polar bears are strong swimmers, as shown in this award-winning snap. But perhaps not strong enough to survive the changing conditions in the north.

French diver-photographer Joe Bunni took this photo in Repulse Bay, Nunavut, north of Hudson Bay in Canada, earning him a spot in the Veolia Environment Wildlife Photographer of the Year 2011 gallery — the photo took top prize in the mammal behaviour category. The winners are on show at London's Natural History Museum until March 2012. This image, says Bunni, is symbolic "of the power and elegance of a wonderful creature struggling to survive in a fast-changing climate".

There are thought to be some 20,000 to 25,000 polar bears throughout the Arctic, spread between 19 different subpopulations. This photograph was taken in Foxe Basin, where 2,300 polar bears are thought to live. The overall estimate of population size hasn't changed by more than a few thousand since the early 1990s — perhaps in part because the data is so sparse, and in part because of hunting reductions: in 1973, Canada, Denmark, Norway, the Union of Soviet Socialist Republics and the United States of America signed a polar bear conservation agreement. The future, however, may not be so bright.

The rapid disappearance of Arctic summer sea ice — 3.3% per decade since the late 1970s — is causing trouble. In 2009, the International Union for Conservation of Nature's Polar Bear Specialist Group estimated that 8 of the 19 bear subpopulations are seeing declining numbers (up from five subpopulations in 2005), three are stable (down from five in 2005) and only one (down from two in 2005) is actually increasing — the M'Clintock Channel population along the central northern Canadian coast, where summer sea ice persists. The population trends for the other subpopulations, including the one in Foxe Basin, are unknown.

A major food source for these bears is seal pups lying on the ice in spring. The earlier the ice breaks up, the less time there is for easy hunting. A study of the Hudson Bay polar bear population,



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where the ice now breaks up weeks earlier than it did decades ago, has shown that survival of very young and very old bears drops by 2–5% for every additional ice-free summer week. Overall, the bears in that part of the world are about 15% skinnier now than a few decades ago (S. Brown, *Nature* <http://dx.doi.org/10.1038/news.2007.282>; 2007).

The Hudson Bay polar bears spend their summers on shore fasting — it is thought that they probably lower their metabolism to make their fat reserves last through the summer. Other polar bears, such as those off the coasts of Alaska and Russia, often follow the ice north as it retreats in the spring. These bears might continue to hunt throughout the summer, but that too might be getting harder: the ice used to retreat perhaps 50 km from shore, but today the ice is often 500 km away from dry land. That puts it over deeper, less-productive water, where there might be less food. Some researchers are now investigating whether these bears, too, enter a kind

of hibernation to last out the summer (<http://go.nature.com/Wgpdmz>).

The extra distance also means that any polar bears heading out to hunt have a long swim ahead of them: in 2008, a bear was tracked swimming 687 km over 232 straight hours (more than nine days). Over the season she lost 22% of her body fat, as well as her cub (G. M. Durner *et al.* *Polar Biol.* **34**, 975–984; 2011).

One research project (C. M. Hunter *et al.* *Ecology* **91**, 2883–2897; 2010) showed that in the Southern Beaufort Sea, any year with more than 130 ice-free summer days (such as 2004 and 2005, for example) impacts the polar bears, and more than one such year in every six causes the population to shrink. The study was influential in a US decision to list polar bears as endangered in 2008. In Canada and Russia, polar bears are listed as a species of special concern (<http://go.nature.com/aITTNi>).

NICOLA JONES