



A new study to understand how polar bears cope with longer ice-free seasons

What is the study and why is it necessary?

Recent declines in summer coastal sea ice, caused by global warming, mean that polar bears may have less time each year to hunt seals. This can cause declines in survival and reproduction, and may have a negative effect on the population. In the summer of 2008, scientists started a new study to determine how polar bears in the southern Beaufort Sea are coping with longer ice-free seasons. This study seeks to answer questions such as:

How do longer summers affect polar bear body condition?

Do polar bears that spend the summer on land find a significant amount of food?

What happens to bears that spend the summer on the pack ice far to the north?

Will more bears be found on land and around villages if the ice-free season continues to increase?

How will these changes affect population size and the number of bears that can be harvested sustainably?

To address these questions, scientists captured 29 polar bears in coastal habitat on Alaska's North Slope in August 2008. Twelve of these bears were fitted with radiocollars. In October 2008, six of the collared bears and one bear without a collar were recaptured. Collars were removed, and the same measurements and samples were taken a second time to determine how the bears fared over the summer. The collars on the remaining six bears, which could not be recaptured because they moved into Canada, had automatic release devices programmed to drop the collars off in November 2008. All radiocollars these days have automatic release devices, which ensure that collars don't stay on bears for multiple years.



Two collared bears and their cubs feed on whale remains near Kaktovik, Alaska. Much of what is known about polar bears—including subpopulation boundaries, how bears use sea ice, where pregnant bears den, and how well bears survive—comes from radiocollars.

In 2009, about 20 bears will again be captured at the beginning and end of the ice-free season. However, in 2009 the study will involve bears that spend the summer on pack ice that occurs far north in the polar basin. Comparing the bears in 2008 and 2009 will provide information on the costs and benefits of spending the summer on land vs. on the pack ice.

Study methods: capture and collaring.

Capturing polar bears is the only way to evaluate their health, body condition, and physiological function.

Captured bears are sedated with the drug Telazol[®]. Telazol has been used safely for decades and studies show that there are no lasting effects of capture on size, body condition, or reproduction. After capture, bears generally recover within a few hours, and metabolize the Telazol out of their system within a day. To be completely safe, the U.S. Fish & Wildlife Service (USFWS) and veterinarians recommend that people wait 14 days after a polar bear has been

captured to consume the meat.

Each bear is marked with tattoos on the inside of its upper lip, and small plastic ear tags. If a tagged bear is harvested, hunters can find out when the bear was last captured and other information (such as the bear's age) by calling the USFWS at 1-800-362-5148.

Captured bears are measured and weighed, and the amount of fat and muscle is determined. Samples of the bear's breath and blood are collected to determine what it has been eating.

From the 12 bears fitted with radiocollars in August 2008, a muscle sample was taken from the rump (about 1/2 inch long and 1/8th inch wide) to determine if fasting bears are getting energy from fat stores or from muscle. Also, a small thermometer was inserted under the bear's skin to monitor body temperature. This can indicate if the bear has entered a state of "walking hibernation" to conserve energy.

All bears captured in August 2008 had a number painted on their backs. These numbers allow bears to be identified so that they are not recaptured unnecessarily. The numbers will either wash off or disappear when the bear molts.

When is a collar too tight, and what should be done if a tight collar is observed?

Over the past 25 years, scientists in Alaska have determined how to apply radiocollars in a way that minimizes discomfort and injury to the bears. Collars are applied by sliding them over the bear's head. Each year, several bears "shuck" their collar by sliding it back off.

Most bears tolerate collars well and few problems have been observed. Some bears develop a yellowish discoloration of the fur around the collar. This is due to oil from the seals and whale carcasses that bears eat, and is not harmful.

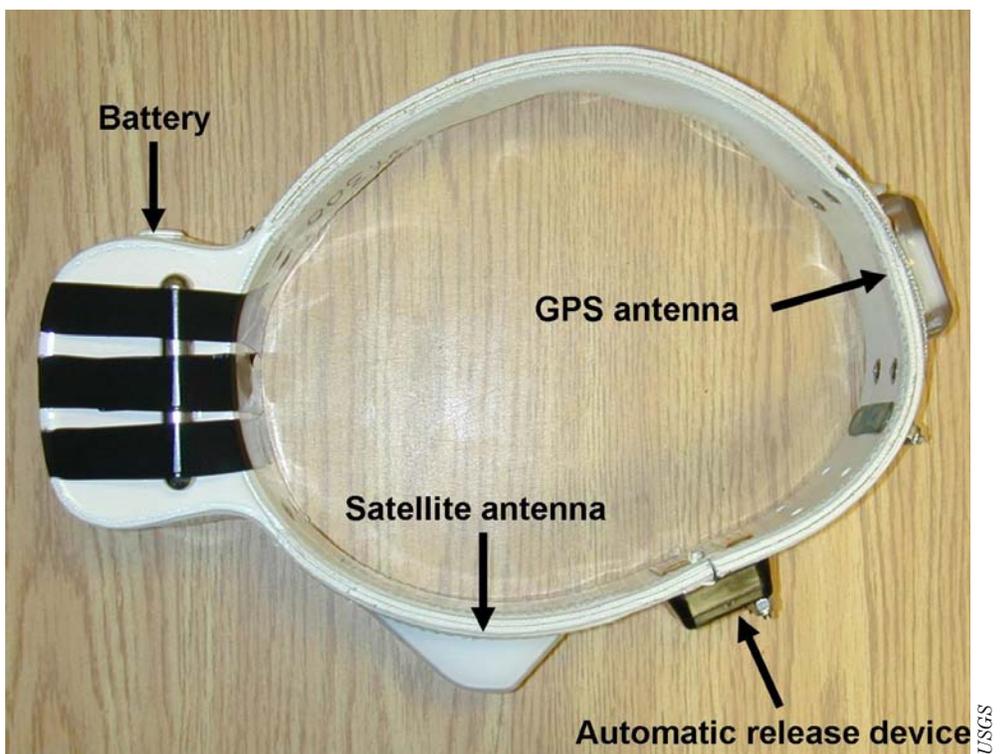
When bears feed on whale remains they can gain a lot more weight than normal, which occasionally causes collars to become too tight. This may lead to minor cuts behind the ears or along the rear edge of the collar. On rare occasions, some extremely fat bears have developed more serious wounds. A bear with a collar that is too tight and causing wounds will probably have blood on the fur of its neck. The collar will appear to be pushing up against the bear's ears, and the bear may shake its head a lot and claw at the collar. If a collared polar bear is observed with these symptoms, please contact the USFWS at 1-800-362-5148. A biologist will respond to the situation and, if necessary, attempt to remove the collar from the bear.

Questions and contact information.

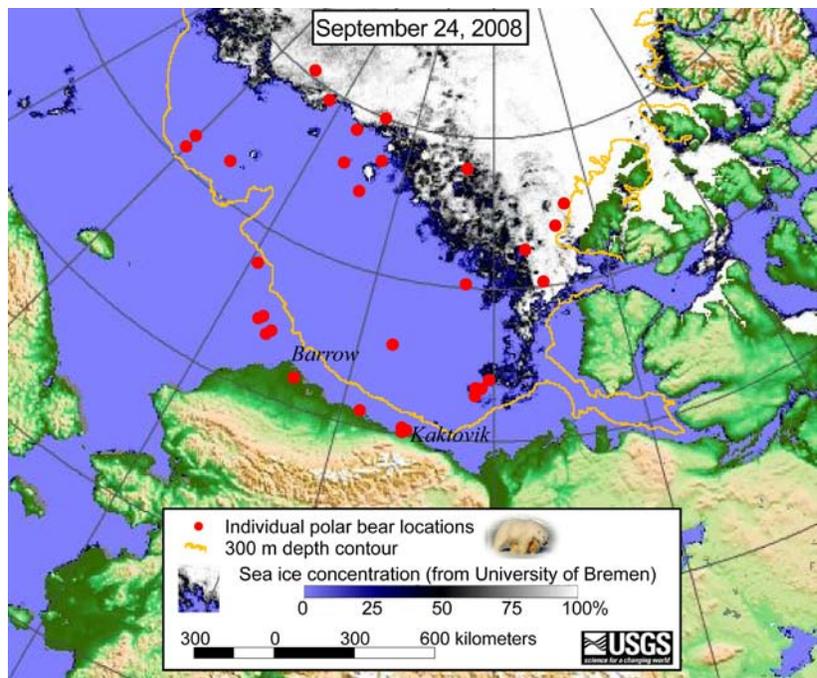
For general questions or concerns about polar bears, please contact the Marine Mammals Management office of the USFWS at 1-800-362-5148.

The study described here is led by the University of Wyoming (UW), in collaboration with USFWS and the U.S. Geological Survey (USGS). It is funded by the National Science Foundation (Grant #0732713). For more information please contact: Dr. Merav Ben-David (UW; bendavid@uwyo.edu), Eric Regehr (USFWS; Eric_Regehr@fws.gov), or George Durner (USGS; gdurner@usgs.gov).

U.S. Fish & Wildlife Service
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Most radiocollars use a Global Positioning System (GPS) to determine a bear's location. Every few days the locations are sent to satellites, which relay them to ground receiving stations. Although scientists are constantly looking for new technology, radiocollars are currently the only way to monitor bears throughout the year in remote areas of the Arctic. Every collar since 2004 has an automatic release device, to ensure that a bear doesn't wear the collar for multiple years.



The red dots are locations of collared polar bears in fall 2008. The dots that appear to be in open water are probably bears on small ice floes, or bears swimming between ice floes. Knowledge from radiocollars of how polar bears use the sea ice helps scientists understand how the bears are responding to global warming.

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Visit the Marine Mammals Management homepage at
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