

TITLE: Polar bears: Body temperature

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FUNDING SOURCE AND GRANT NUMBER:

National Science Foundation, Office of Polar Programs Grant 0732713.
U.S. Geological Survey, Ecosystems and Climate and Land Use Change Mission Areas

DATA SET OVERVIEW:

To establish whether polar bears that follow the pack ice north of the continental shelf experience food deprivation, and to estimate their ability for prolonged adaptive fasting and skeletal muscle protein and strength retention in comparison with land-bound bears, our goal was to sample individuals at the beginning of the ice-retreat period in the summer, and shortly before annual ice is re-formed. In the Beaufort Sea, the ice-retreat period extends from late-June to mid-July and new ice forms from mid to late-October.

This dataset contains body temperature values for individual polar bears captured via helicopter darting using standard animal immobilization techniques (details in Durner et al. 2011). A subset of adult bears were surgically implanted with a sterilized subcutaneous temperature logger (Onset Tidbit StowAway TBI-32, HOBO data loggers, Cape Cod, Massachusetts, USA) in the sacrum region. Additional bears were implanted with a temperature logger (iButton, Maxim Integrated Systems, San Jose, California, USA) in the abdomen beneath the linea alba.

During our research efforts from August 2008 to May 2010, a total of 110 polar bears were captured and sampled and 29 were recaptured on shore and on the sea ice. Spring captures occurred on the ice between Point Lonely and the US Canadian border within 160 km of shore. Summer captures occurred in the same area on shore. Fall captures occurred in the same area on shore, and on the sea ice from the Alaskan coast to 80°N and from north of Wrangell Island, Russia, to Banks Island, Canada. Ice captures were conducted from the USCG *Polar Sea*.

Project information and updates can be found at www.uwyo.edu/polarbear

INSTRUMENT DESCRIPTION:

The Onset Tidbit StowAway TBI-32 temperature logger is completely sealed underwater temperature data logger, which is controlled through optic communications. This model records 32K of temperature measurements from -20°C to +50°C (-4°F to 122°F). For instrument specifications see <http://www.onsetcomp.com/products/data-loggers/tbi32-2050>.

iButtons are small sealed temperature loggers that are controlled via their external casings. For specifications see <http://www.maximintegrated.com/products/ibutton/ibuttons/>.

DATA COLLECTION and PROCESSING:

A subsample of adult polar bears were selected for implantation of an Onset Tidbit StowAway temperature loggers (TBI-32, HOBO data loggers, Cape Cod, Massachusetts, USA). The logger recorded subcutaneous rump temperature at 10 minute intervals. For detailed see Durner et al. (2011). Additional bears were implanted with a temperature logger (iButton, Maxim Integrated Systems, San Jose, California, USA) in the abdomen beneath the linea alba. These loggers recorded temperature every 60 minutes. Both types of loggers were coated with inert wax (Paraffin Elvax, Respirationics, Bend, OR, USA), sterilized, and surgically implanted; when a bear was recaptured, loggers were retrieved and data was downloaded.

DATA FORMAT:

Data file structure: Microsoft Office Excel (.xlsx), Comma delimited ASCII (.csv)

Data format and layout: Each variable is listed in a separate file. Headers provide variable names and units of measurements. To obtain data from multiple files select from the appropriate list.

List of parameters: Subcutaneous temperature (°C), Abdominal temperature (°C).

Description of flags: For data protected under the threatened species status code is "UTSS".

Data version 1.0 date 01/12/13

DATA REMARKS:

Data files include values collected prior to, and after the loggers were implanted in the bear. Such data were collected for validation and quality control purposes. All data are subject to change.

To view and manipulate data use Microsoft Excel.

REFERENCES:

Durner, G. M., J P. Whiteman, H. J. Harlow, S. C. Amstrup, E. V. Regehr, and M. Ben-David. 2011. Consequences of long-distance swimming and travel over deep-water pack ice for a female polar bear during a year of extreme sea ice retreat. *Polar Biology* 34: 975-984.