

TITLE: Polar bears: Adipose analyses

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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 values on subcutaneous fat thickness (cm), adipose tissue lipid content, adipose tissue fatty acid profiles, and adipose tissue stable carbon isotopes (including percent C) for individual polar bears captured via helicopter darting using standard animal immobilization techniques (details in Durner et al. 2011).

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:

NA

DATA COLLECTION and PROCESSING:

From a subsample of adult polar bears, approximately 0.5 g of subcutaneous adipose tissue was collected from the biceps femoris region of a hindlimb using sterile procedures and stored in liquid nitrogen. During sample collection the fat thickness was marked on a sterile tongue depressor and measured with a ruler.

Adipose samples collected during our 2008-2010 study will be sent to at the University of Missouri Agricultural Experiment Station Chemical Laboratories. Lipids from the adipose tissues will be extracted using chloroform:ethanol extraction protocols, quantified gravimetrically, and converted to FAMES. Fatty acid profiles will be generated using high-performance liquid chromatography and mass spectrometry (<http://www.aescl.missouri.edu/lipids.html>). Data have not been generated yet.

Adipose samples were prepared for stable carbon isotope signatures following standard protocols (Ben-David and Flaherty 2012) and submitted to the University of Wyoming Stable Isotope Facility (for quality assurance visit www.uwyo.edu/SIF). Data has not been generated yet.

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 fat thickness (cm), Adipose $\delta^{13}\text{C}$, Adipose %C, lipid content, fatty acid profiles.
Description of flags: For data protected under the threatened species status code is "UTSS".

Data version 1.0 date 01/11/13

DATA REMARKS:

Data for Adipose $\delta^{13}\text{C}$, Adipose %C, lipid content, and fatty acid profiles have not been generated as of January 11, 2013.

To view and manipulate data use Microsoft Excel.

REFERENCES:

Ben-David, M. and E. A. Flaherty. 2012. Stable isotopes in mammalian research: a beginner's guide. *Journal of Mammalogy* 93: 312-328 (special feature on Stable Isotopes).
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.

