

NWMB FINAL REPORT

NWRT Project Number: 2-13-22

Title: Nunavut Wildlife Survey from space: use of high resolution imagery to track population size and trends

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Summary:

This project intends to use high resolution satellite imagery to detect polar bears. Comparing detection with concurrent population estimates following established protocols (mark-recapture and/or aerial survey with distance sampling) allow comparison between methods. The work is non-invasive and, if determined feasible, could be implemented for population monitoring to reduce disturbance to wildlife and take into account concerns about wildlife capture and handling.

Project Objectives:

1. Assess the utility of very high resolution satellite imagery for estimating abundance of polar bears in rugged terrain;
2. Develop a practical monitoring strategy at a large scale;
3. Remove disturbance to wildlife while monitoring;
4. Obtain complete survey of areas and not rely on transects only as classic surveys do; and
5. Engage the public participation in science (reading of pictures made freely available)

Project objectives remain the same.

Materials and Methods:

The aerial work was originally designed as an aerial survey to provide a population estimate; however, the Baffin Bay work was completed in conjunction with the mark-recapture work, and while this provides ground-truthing, it is not equivalent to an aerial survey for population estimation. No aerial survey was completed in fall 2013 in Foxe Basin on White and Vansittart Islands. High resolution imagery has been obtained for the Baffin Bay study area and is undergoing analysis.

Following the feasibility assessment, collaborators would consider targeting other wildlife species for remote sensing work. This is possible currently using archived satellite imagery (available at a fraction of the cost of custom scheduled imagery) and can be applied to recent surveys of muskox on Bathurst Island and/or King William Island, which were surveyed in May and September 2013 respectively.

Project Schedule:

Pre-project consultation – complete.

Aerial surveys – not done for Foxe Basin; completed for Baffin Bay.

Satellite image interpretation – on-going
Data analysis/report writing – on-going

Preliminary Results/Discussion:

The initial work in northern Foxe Basin (fall 2012) has been compiled as a manuscript and is currently In Review, and will be relevant to this project although the 2013 Foxe Basin work did not proceed. The Baffin Bay rugged terrain satellite image interpretation is currently on-going. Satellite imagery was ground-truthed during the mark-recapture work in Baffin Bay, with observers marking locations of bears encountered. Work on evaluating the spectral signature of polar bears using Rowley Island data is also on-going.

The University of Minnesota (UMN) received funding in 2012 and 2013 and purchased some imagery from both Foxe Basin (2012) and Baffin Bay (2013). Seth Stapleton (UMN) recently received the 2013 imagery, and is working with the Polar Geospatial Center to obtain additional archived imagery at no additional cost. Michelle LaRue (UMN) is also dedicating time to the remote sensing work. Our goal is to have some preliminary results from Baffin Bay and the spectral signature work by late spring.

Digital Globe, through collaborations with UMN, also recognizes the utility of remote sensing for other species such as muskox, and imagery will be available as in-kind support to follow up on this potential use of satellite imagery.

Reporting to Communities:

Consultations will be held with communities when results are available.

The utility of this method for muskox surveys will be discussed in April with Resolute Bay and Iviq (Grise Fiord) HTAs, pending HTA availability.