

SURFING THE CLIMATE WAVE

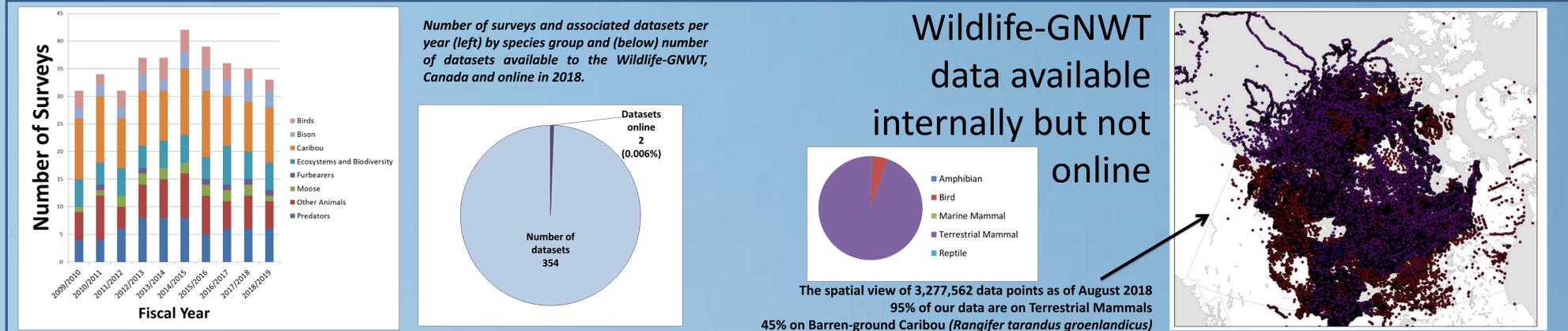
Pushing quality data on biodiversity online is essential for climate change adaptation in the Arctic.

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Local governments in the Circumpolar Arctic routinely collect a substantial amount of data on biodiversity. These datasets are rarely visible online. Using our own organization, the Wildlife Division of Government of the Northwest Territories (Wildlife-GNWT), as a test case we estimated (1) **OUR DATA**, how much of our own biodiversity location data; and (2) **DATA ABOUT NWT**, how much of any biodiversity location data about the Northwest Territories (NWT) were available online. We also investigated (3) barriers to **PUBLISHING ONLINE**. We conclude on the potential impacts of the lack of our online data may have on decisions related to species conservation and climate change adaptation across the Arctic.

1 – OUR DATA

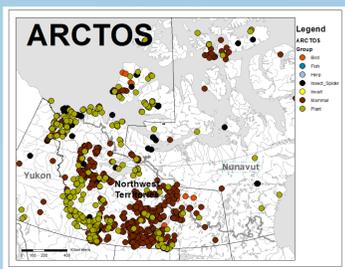
Wildlife-GNWT staff collect location data from aerial surveys, satellite collars, nest visits, museum labels, snow tracks, wildlife health, hunting, traditional and local knowledge, and citizen science. In 2018, only two datasets (0.006%) out of 354 datasets available internally to Wildlife-GNWT are online.



2 – DATA ABOUT THE NWT

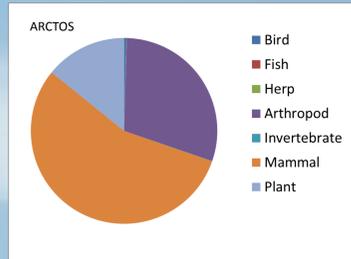
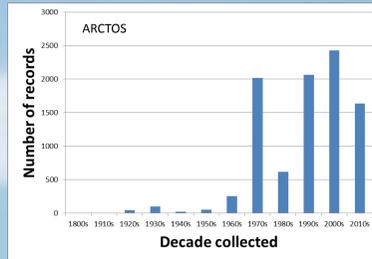
We investigated the availability of NWT biodiversity location data online on these platforms: GBIF^(a), ebird, Canadensys, PolarData, NWT Discovery Portal.

There were no location data about NWT biodiversity in PolarData and NWT Discovery Portal. Canadensys yielded 62,491 records but location data (lat and long) were not included in the package. The ebird data download was not granted. Arctos provided 10,323 records, including the two datasets provided by Wildlife-GNWT. iNaturalist data could not be downloaded directly, however, a data-sharing agreement between NatureServe and iNaturalist allowed us to obtain data^(b). Cross-pollination exists from ebird, iNaturalist, ARCTOS and Canadensys to GBIF, where records from 338 published datasets could be downloaded. Records from other regions but mis-labeled to NWT are included in the maps. The GBIF data download was searched using a small map with a polygon; a larger area than the NWT was searched due to difficulties with the projection at high latitudes.

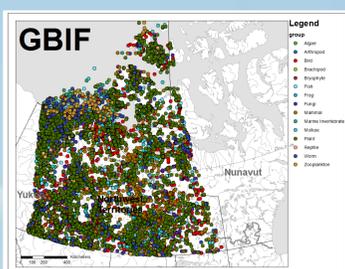


ARCTOS = 10,323 records
100% Museum specimens

Data searched for Northwest Territories.

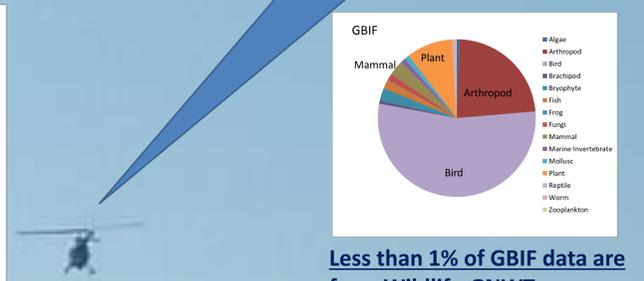
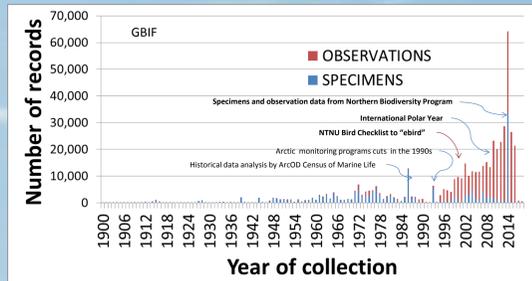


Collecting data in the Arctic is expensive! But posting our data online has been nearly impossible... why?



GBIF = 534,195 records
44% Museum specimens
56% Observations

Data truncated to north of 60° latitude, searched using a polygon larger than the NWT.



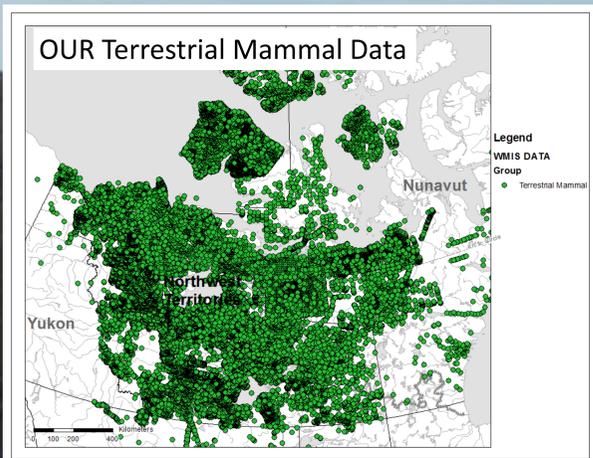
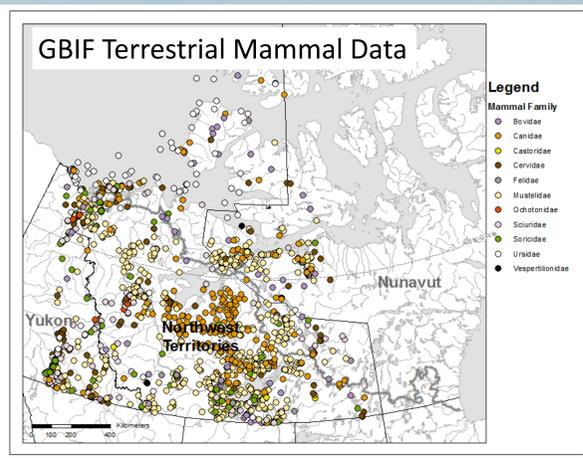
Less than 1% of GBIF data are from Wildlife-GNWT.

3 PUBLISHING ONLINE

We investigated barriers to open data in Wildlife-GNWT^(c). We used a questionnaire sent to all Wildlife-GNWT biologists and to our wildlife co-management board partners (n=12; we are a small jurisdiction after all!).

None had personally posted data online; our only two published datasets were made available by partner organizations through ARCTOS. The main reasons reported (from more to less important), were (1) data was co-managed and the partner organization was not willing to share the data openly; (2) online data would increase threats to a species or a habitat, such as increased access or disturbance; (3) online data would reduce the novelty or originality of the data by allowing others to publish before themselves and without acknowledgement; and, (4) lack of technical capacity to post online. Additional barriers indicated by respondents included "misinterpretation of the data, misusing data, not being fully aware of limitations", "lack of guidelines from employers", "...administrative burden and lack of support to share data", and "wanting key partners to be informed of results before they are widely publicized".

The main barriers to open data can be overcome with appropriate policies and procedures for data security, and better frontline communication with data partners on the objectives to data sharing. Limited technical and administrative capacity may prove a most enduring barrier for a small jurisdiction like the NWT. Online data publishing, so far, have been conducted via partners outside the NWT. There is also limited internal capacity to service online the high data volumes such as the biodiversity data produced by Wildlife-GNWT annually (about 100,000 location data). Most of our data holdings are on terrestrial mammals, a group of considerable economic and cultural significance for the NWT.



- With a rapidly changing climate, accessing open data is critically important. However, much of our data remain unavailable online.
- By posting our data online we would contribute more accurate studies on the rapid changes in movements and habitat use of large terrestrial mammals in northern Canada.
- We would also benefit by reducing risk of losing valuable data, by better engaging with research partners, funding agencies, and the public.
- We would better communicate our knowledge and our knowledge gaps to the benefit of everyone.

How do you share your data?

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(a) URLs Available on handout, Data downloaded July – August 2018. GBIF.org (07 August 2018) GBIF Occurrence Download <https://doi.org/10.15468/dl.ximnu>
(b) Data obtained on 3 May 2018.
(c) The list of barriers to rank in the questionnaire were developed following Tulloch et al. 2018. A decision tree for assessing the risks and benefits of publishing biodiversity data. Nature Ecology and Evolution. <http://www.nature.com/articles/s41559-018-0608-1>