Universidad de Oviedo

UMIB
Unidad Mixta de Investigación en Biodiversidad

Naturhistoriska riksmuseet

Arctic Islands

Biodiversity consequences of climate driven fragmentation of arctic ecosystems

Terrestrial arctic ecosystems are fragmented around the polar basin

Global warming will lead to a northward expansion of boreal species

and a northward retraction of arctic species

which will lead to further fragmentation of arctic ecosystems

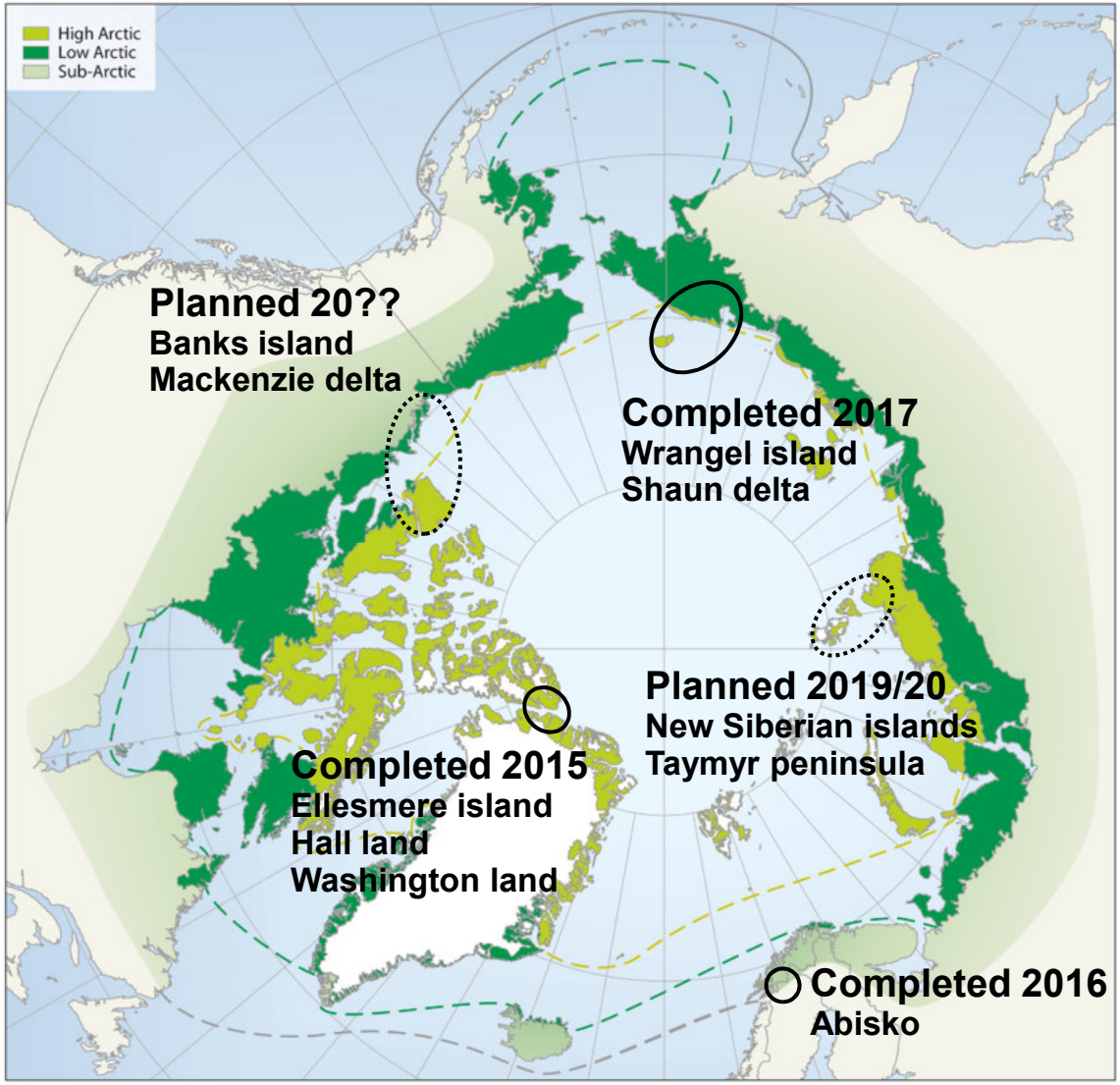
What consequences will such fragmentation have on arctic biodiversity?

I. How will such fragmentation influence arctic biodiversity?

II. Which processes will cause species turnover?

III. At what spatial scales will these different processes be relevant?

What consequences will such fragmentation have on arctic biodiversity?




Vascular plants


Arthropods

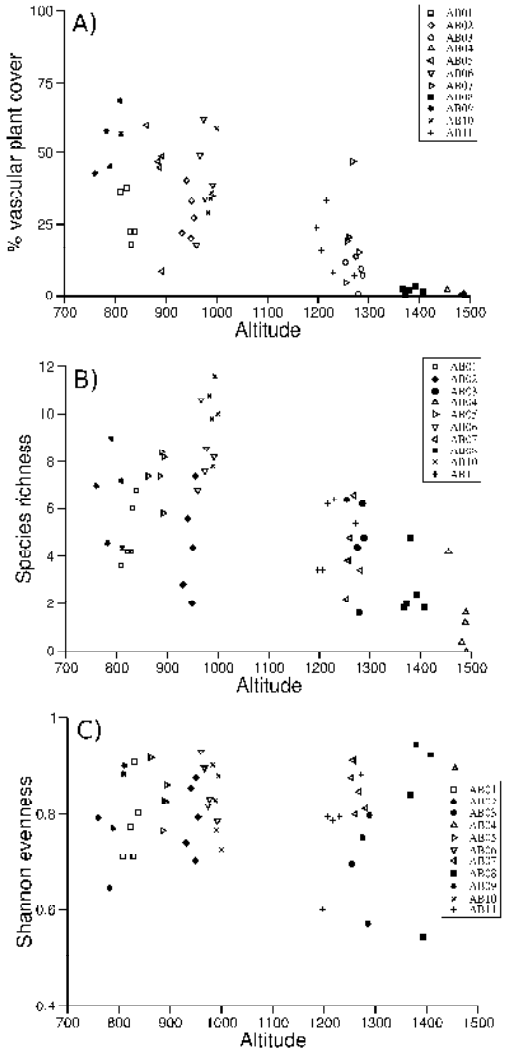

Birds

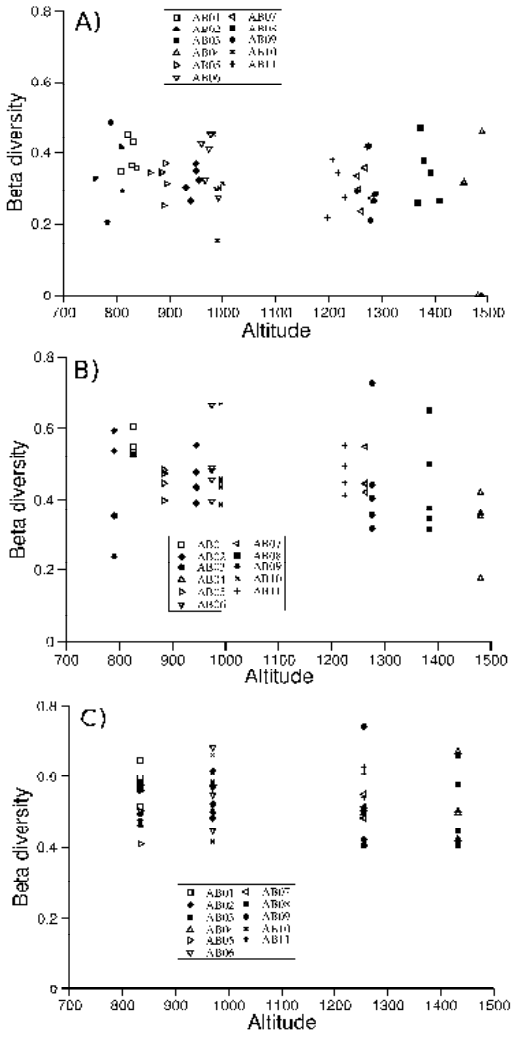

Mammals


Plant-herbivore


Predator-prey

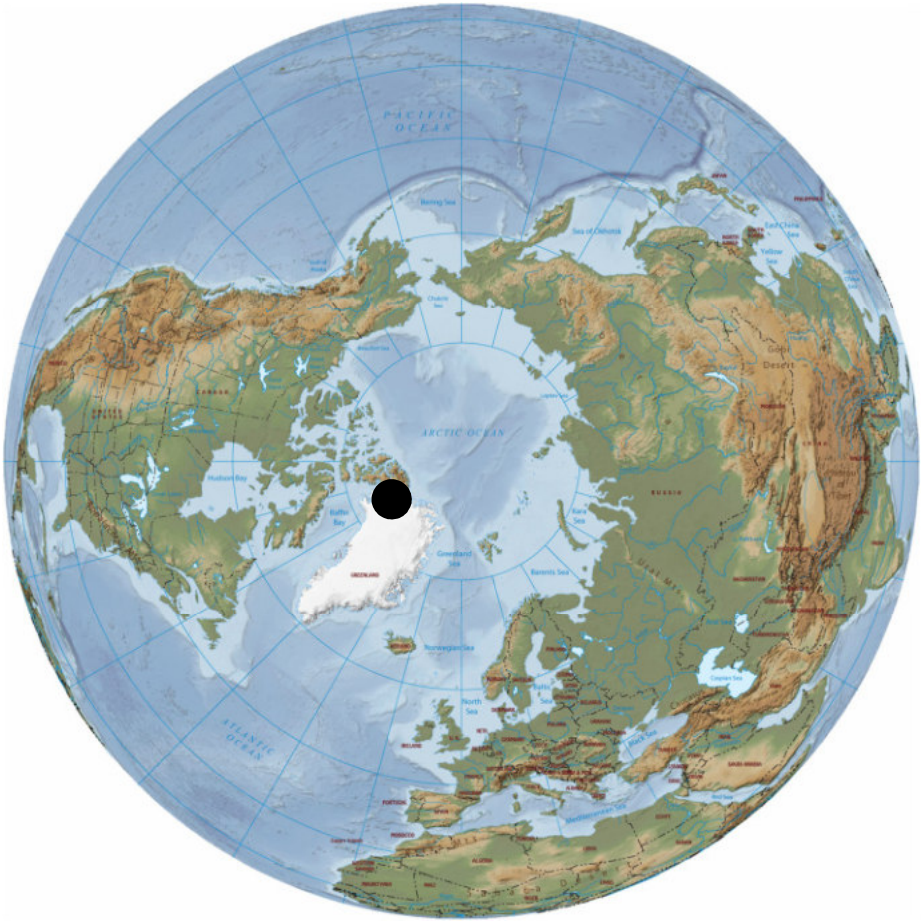
Preliminary results: The importance of local conditions

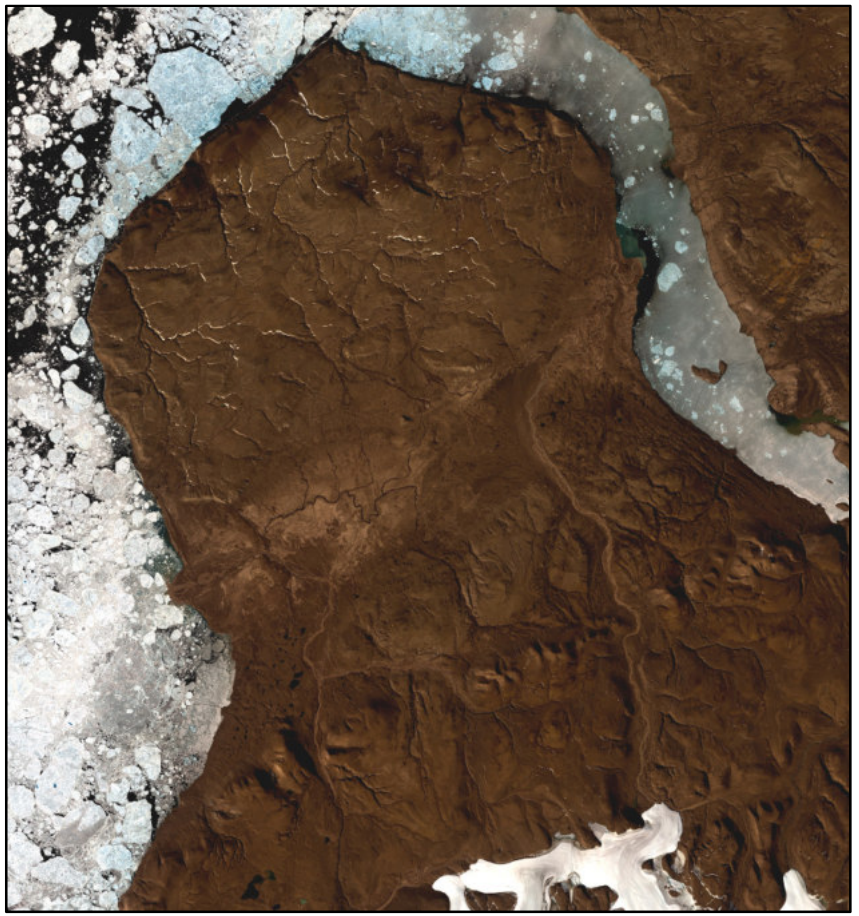




Naud et al. In Review

Preliminary results: The importance of local conditions





Preliminary results: The importance of local conditions

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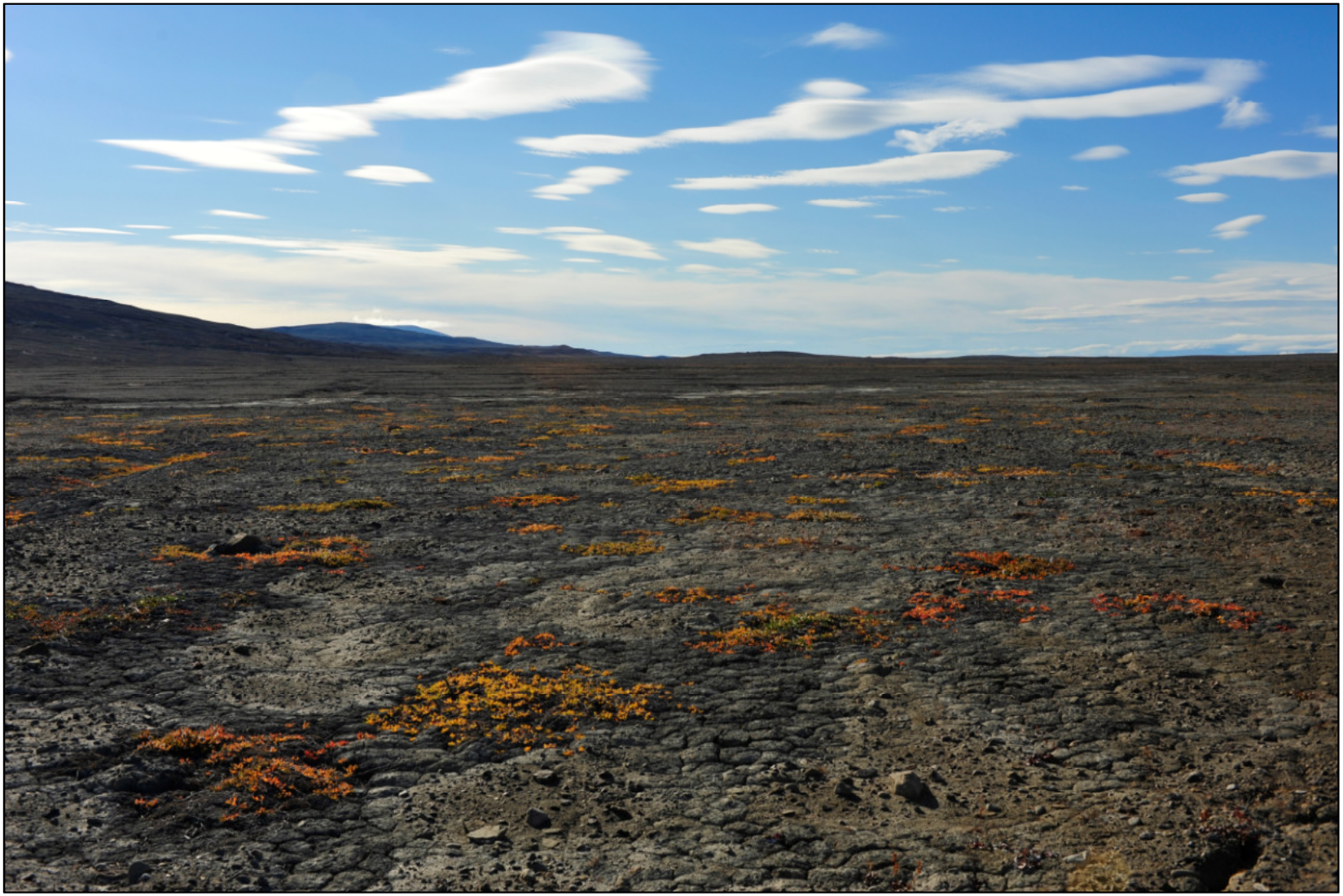

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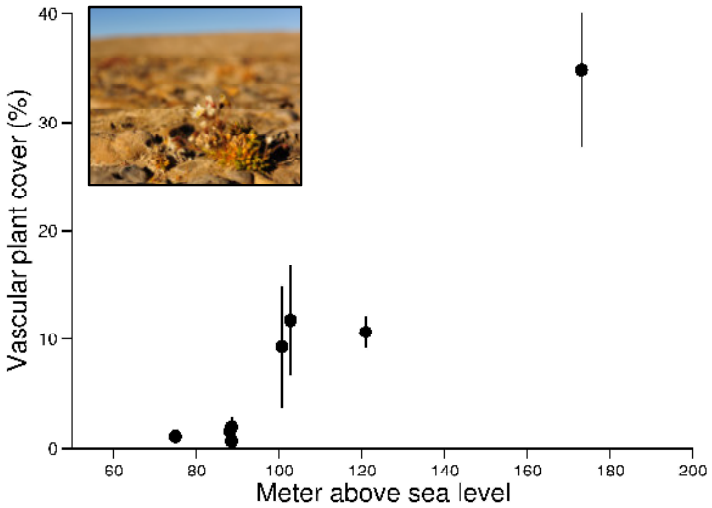
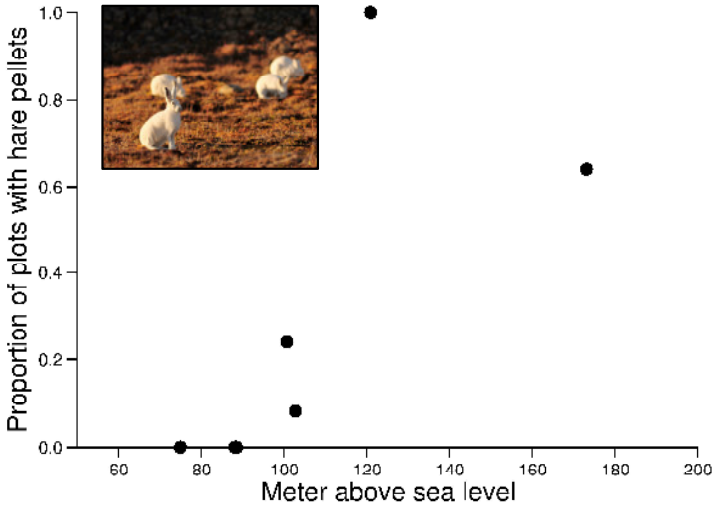
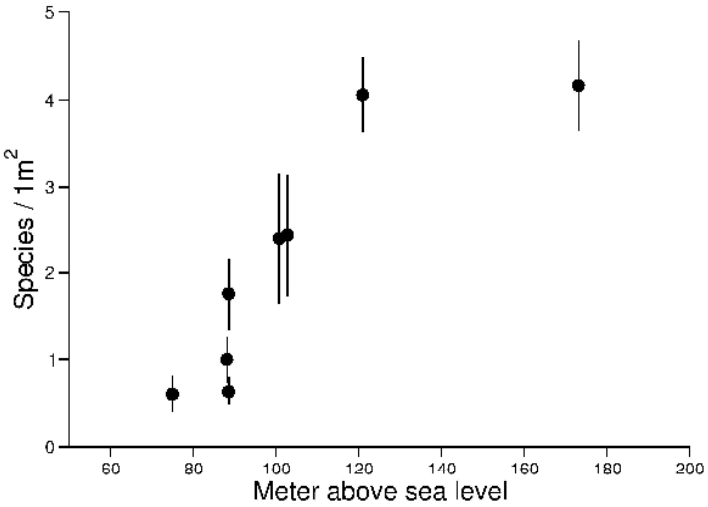
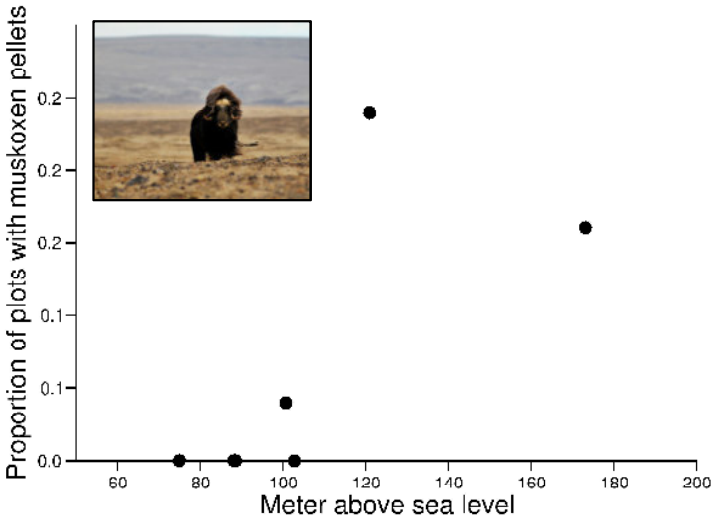


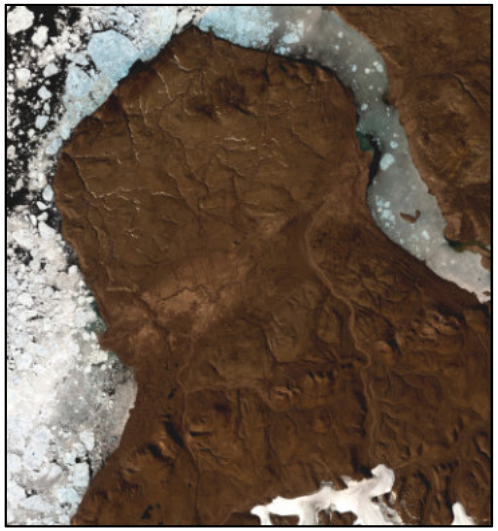


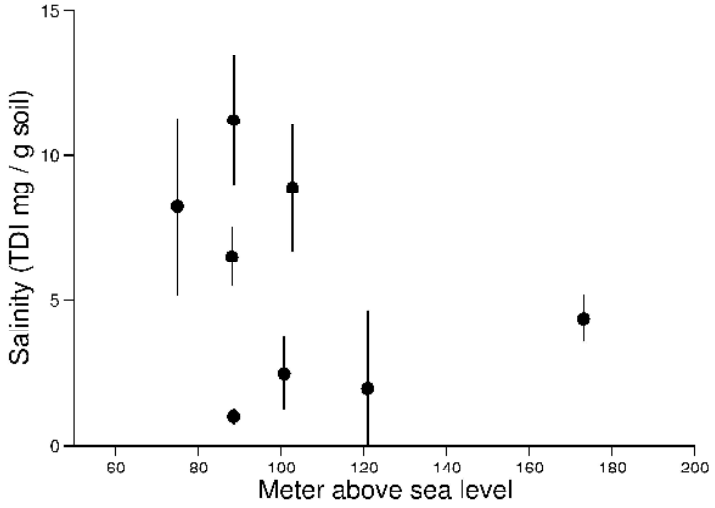




Dalerum et al. In Prep

Preliminary results: The importance of local conditions





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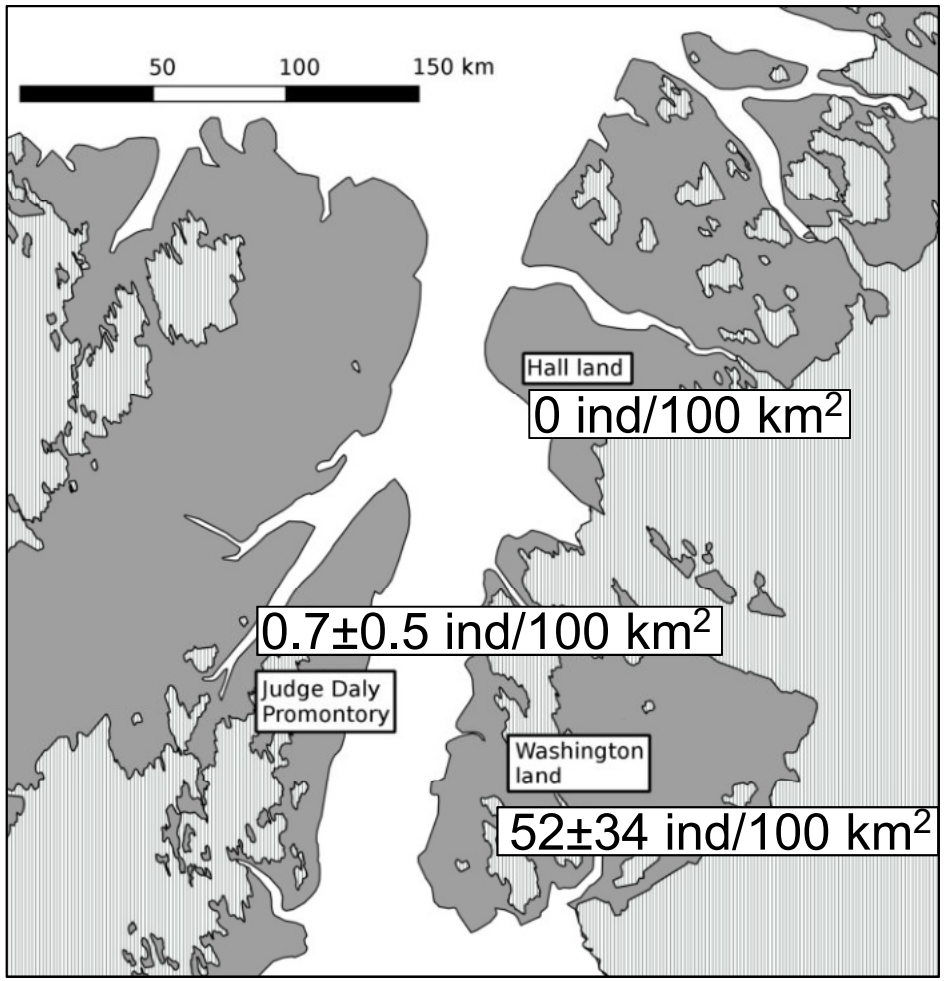
Preliminary results: Regional variation



Dalerum et al. 2017 *Polar Biol* 40:2113-2118

Preliminary results: Regional variation

Table 1. Diet from this and other studies of wolves (*Canis lupus*) in high, central, and low Arctic areas estimated from scat or stomach content.

Region and sites	No. of samples	Caribou (%)	Moose (%)	Caribou or moose (%)	Muskoxen (%)	Arctic hare (%)	Microtines (%)	Canid (%)	Medium-sized mammals (%)	Birds (%)	Arthropods (%)	Source
High Arctic												
Ellesmere Island	16				31	50	31[a]	13		6	6	This study
Hall Land	21				76	24	29[a]				5	This study
Washington Land	17					100	12[a]					This study
Ellesmere Island	85				7	83						Tener 1954
Nansen Land	107				79	7	20[a]	2				Marquard-Petersen 1998
Eastern Greenland												
Hold with Hope	344				65	2	10[a]			36	0.3	Marquard-Petersen 1998
Canadian central Arctic												
Karrak Lake	85	65			9	18	12			29		Wiebe et al. 2009
Banks Island	153[b]	5			90	1	16	3		3		Larter 2013
Victoria Island	29[b]	10			97	3	10	3				Larter 2013
North American low Arctic												
Northeastern Yukon	208	18	41	37			4		37[c]	0.5		Hayes et al. 2016
Northwest Territories	153	5			90	1	16	3		3		Kuyt 1969
Northwestern Alaska	1182	69	32				16		8[c]	20		Spaulding et al. 1998
	920	62	1	32			11[d]		15[e]	2	1	Stephenson and James 1982

Note: Diet values are reported as frequency of occurrence (i.e., the number of scats containing a prey class divided by the number of scats for each location multiplied by 100).
[a]The Greenland collared lemming (*Dicrostonyx groenlandicus*) was the only microtine rodent present.
[b]Stomachs and scats combined.
[c]Includes beaver (*Castor canadensis* Kuhl, 1820), muskrat (*Ondatra zibethicus* (Linnaeus, 1766)), snowshoe hare (*Lepus americanus* Erxleben, 1777), and an unknown furbearer.
[d]Microtines and squirrels combined.
[e]Includes arctic ground squirrel (*Spermophilus parryii* (Richardson, 1825) = *Urocitellus parryii* (Richardson, 1825)), snowshoe hare, and an unidentified carnivore.

Dalerum et al. 2018 *Can J Zool* 96:277-281

Summary

Large effects of local conditions, even within relatively small scales

Geological history influential for spatial distribution of current biodiversity

Large variation on regional scales

Effects of fragmentation will be spatially variable, and possible very hard to predict and generalize