Wildlife & Ecosystem Services Working Group

Phase 1

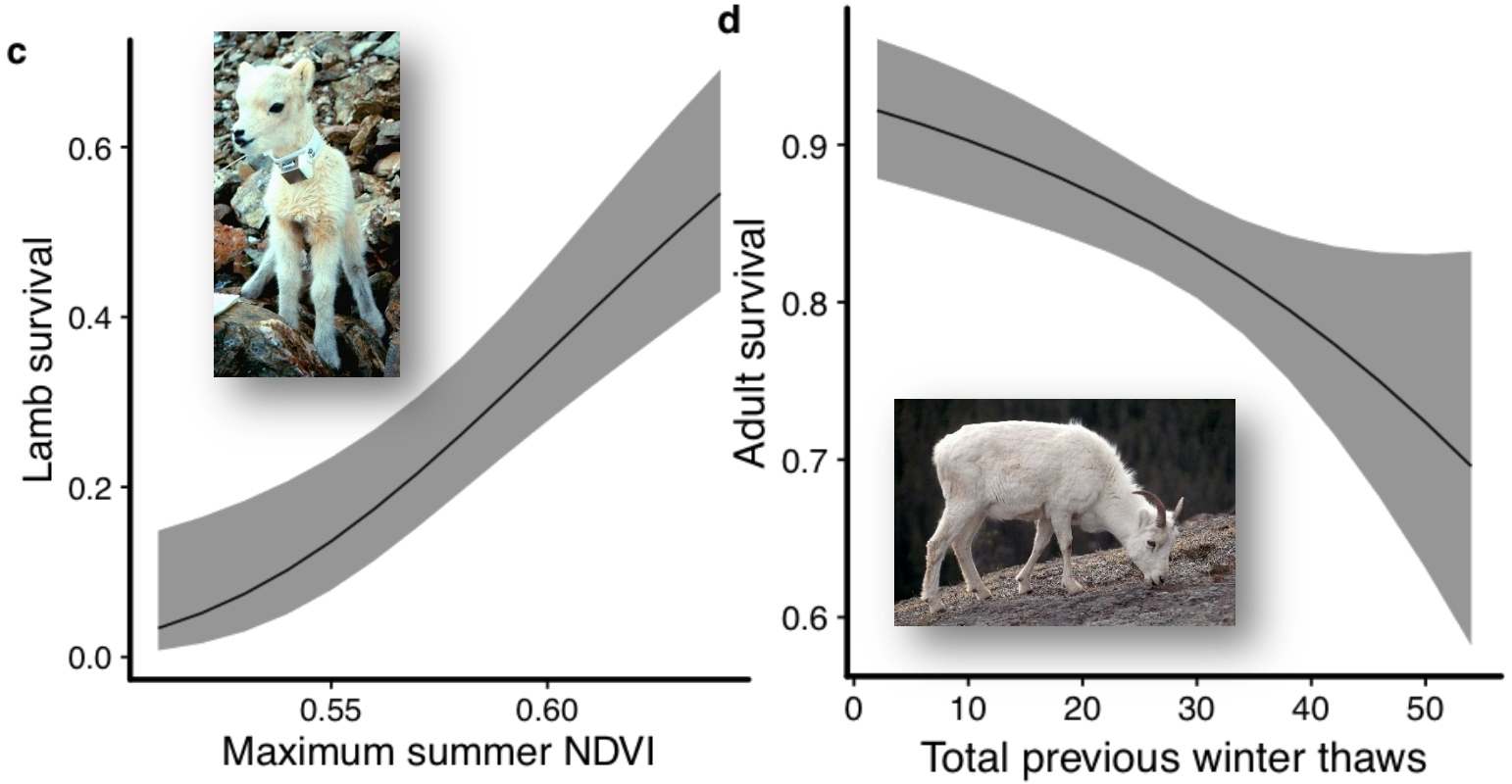
Remote sensing reveals drivers of Dall sheep survival

POSTER! Assessing Alpine Ecosystem Vulnerability to Environmental Change Using Dall Sheep as an Iconic Indicator Species (**Prugh-01**)

- satellite RS products predicted sheep survival better than met data
- passive microwave RS provides key snow surface data, underutilized by wildlife ecologists
- <u>benefits of warming (inc. NDVI) may be counteracted by increase in winter freeze-thaw events</u>

NDVI predicts lamb survival

PM freeze-thaw predicts adult survival



van de Kerk et al. *in review*

Phase 1

The influence of snow conditions on Dall sheep productivity

Chris Cosgrove, Anne Nolin, Laura Prugh, Jeff Wells and Judy Putera **(Prugh-01)**

- Compared **22 years** of summer Dall sheep surveys in the Wrangell St Elias National Park to **7 snow indices as simulated by SnowModel** (Liston and Elder, 2006)
- Used **Lamb-to-ewe ratios** as a measure of Dall sheep **productivity**
- ***Fall*** conditions, and specifically mean Sep **snow *depth***, are most important

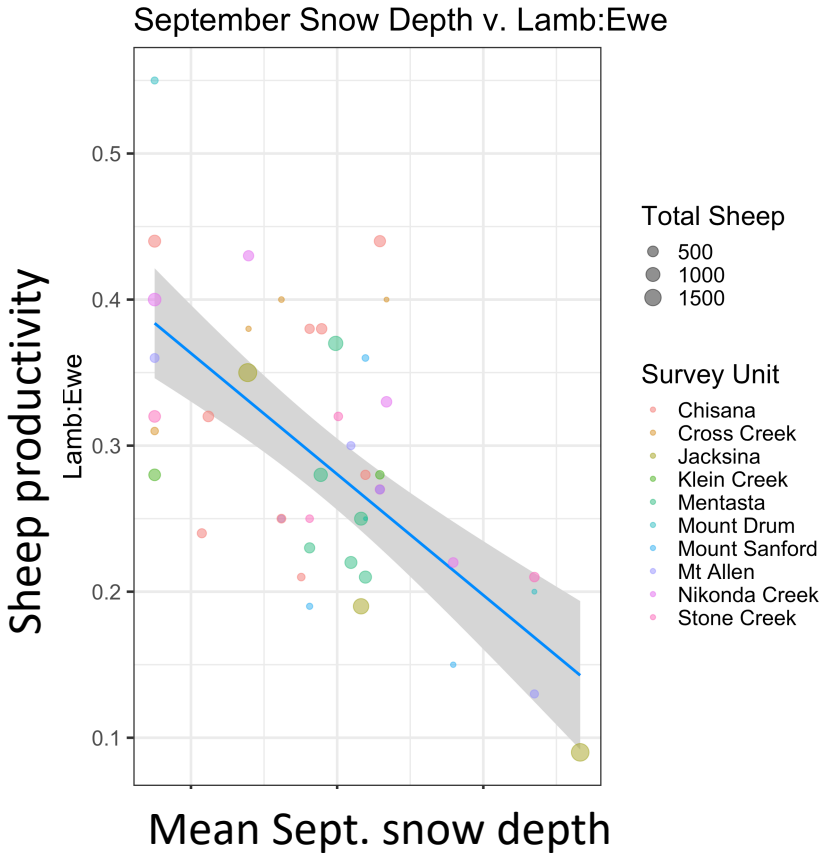


Photo: Laura Prugh

Rank	Month	AICc	Weight	Model
1	Sep	-79.06	0.999	Mean Monthly Snow Depth + (1 | Survey.unit.name)
2	Apr	-64.50	0.001	Mean Monthly Forageable Area + (1 | Survey.unit.name)
3	Apr	-61.62	0	Mean Monthly Snow Density + (1 | Survey.unit.name)
4	Nov	-60.81	0	Sum Days of Mean SWE Loss >2 mm + (1 | Survey.unit.name)
5	Sep	-58.22	0	Mean Monthly Air Temperature + (1 | Survey.unit.name)
6	Sep	-56.11	0	Sum Days of Mean SWE Loss >2 mm + (1 | Survey.unit.name)
7	Sep	-45.71	0	Sum Total Monthly Snowfall + (1 | Survey.unit.name)

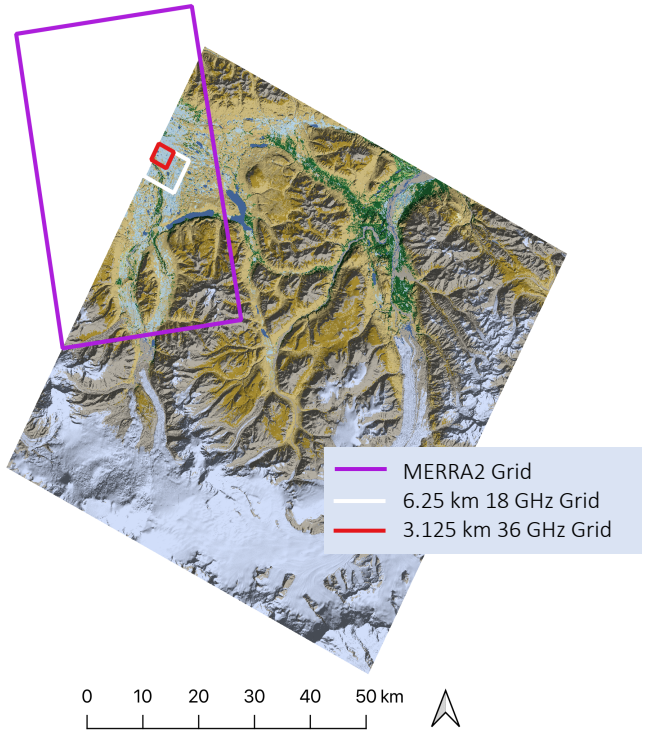
Cosgrove et al., *in prep*

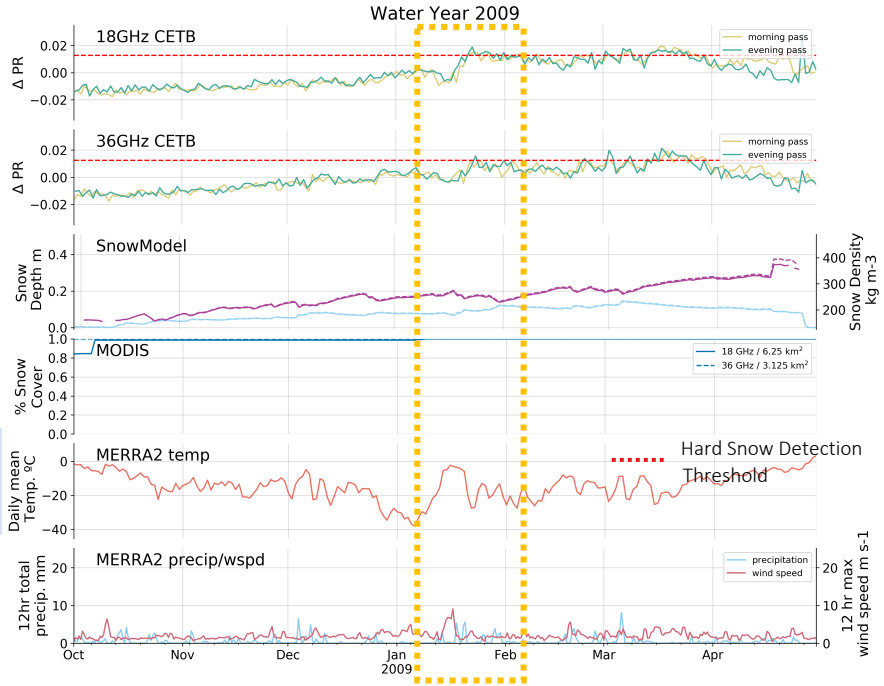
Phase 1

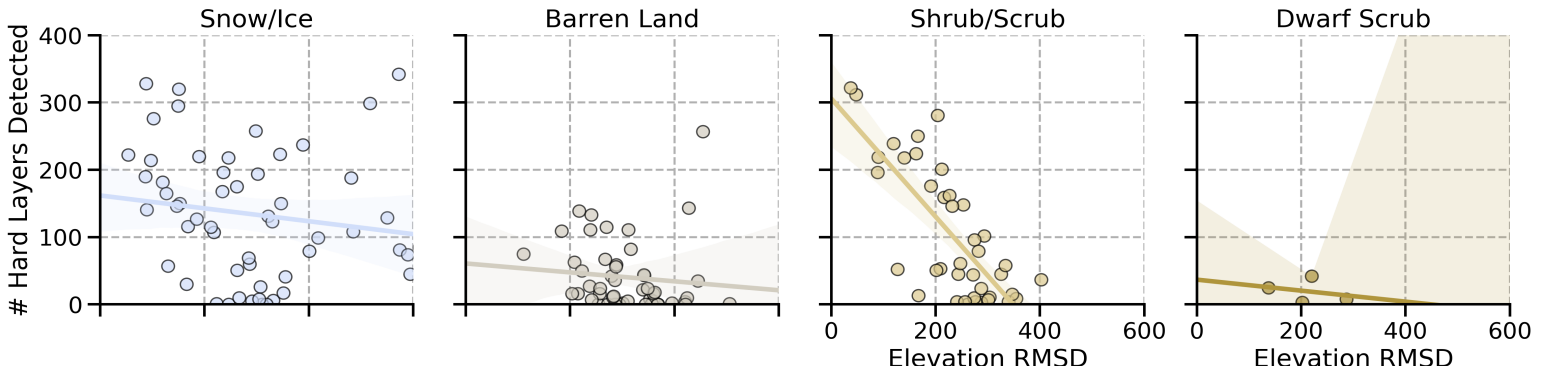
Mapping Hard Snow Layers in Complex Terrain with Passive Microwave

Chris Cosgrove & Anne Nolin **(Prugh-01)**

- Hard snow layers are **important for ungulate foraging & travel**
- Hard snow layers were **mapped** in the **Wrangell St Elias National Park** from **2002 to 2010** using the Calibrated Enhanced-Resolution Passive Microwave Daily EASE-Grid 2.0 Brightness Temperature ESDR (3.125 km and 6.25 km)
- Promising results show **linkages between mapped hard snow and mid-winter melt/refreeze events**
- Currently the algorithm works over relatively flat terrain [rugged topography presents a problem]



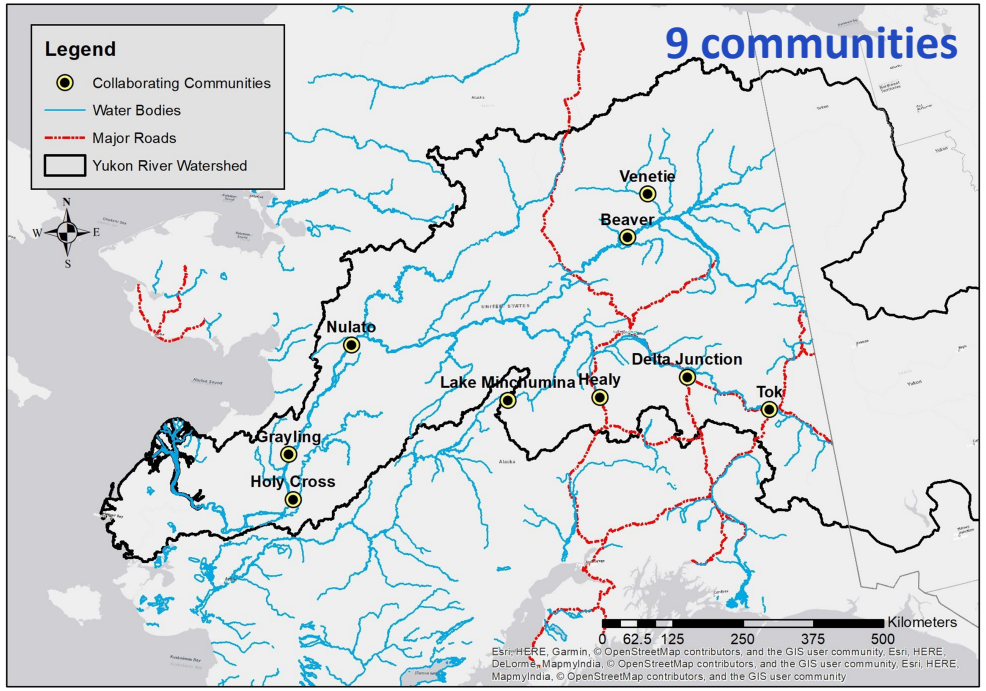




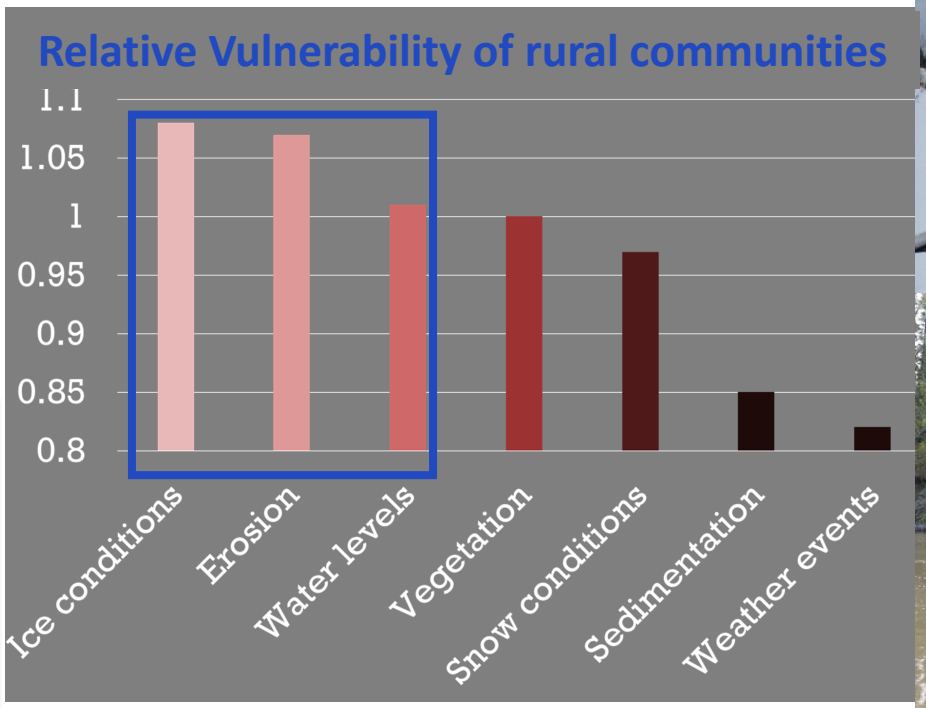
Phase 1

Biophysical Characteristics and Mechanisms of Environmental Disturbances Influencing Human Access to Ecosystem Services in Boreal Alaska

(Brinkman-01)



Using 482 photo observations and 22 intensive interviews, we assessed rural community vulnerability to changing environmental conditions.

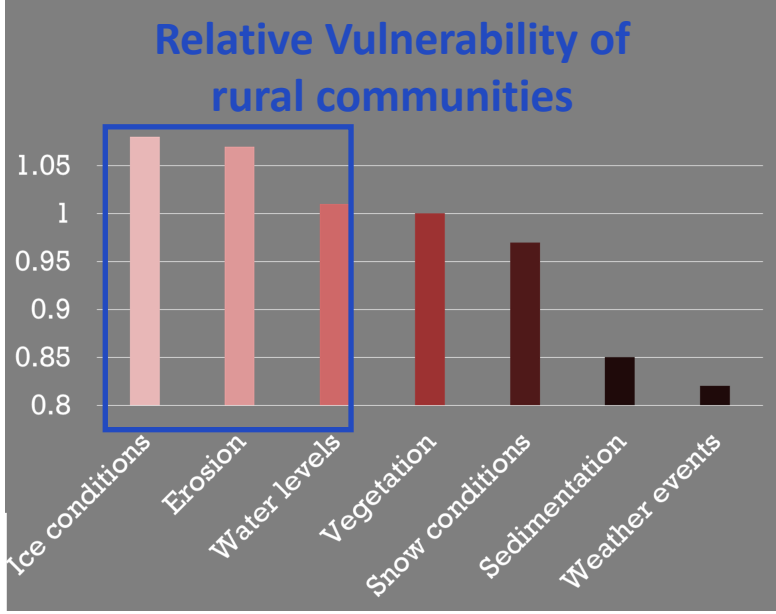


Cold et al. (*in review*) Ecology and Society

Phase 1

- **River Ice Conditions**
  - earlier spring breakup
  - later fall freeze

  → narrowing window of “SAFE” ice for travel



Phase 1

Making Headlines in Alaska:
Fall temp. effects on hunting & River ice safety issue

www.kdlg.org/post/warm-weather-meant-tough-hunting-gmus-17b-and-c#stream/0

Search

EarthExplorer | FAA Aviation Weather... | Webmail | AK GIS Layers | Band Combinations fo... | Alaska Hunting | Blackboard | ADFG Regs | Uaonline

Warm weather meant tough hunting in GMUs 17B and C

By ISABELLE ROSS • SEP 20, 2018

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Biologists and hunters are theorizing that moose laid low to escape the heat and inadvertently escaped the freezer.

CREDIT ADF&G

Showing Results for "fell through ice"

20 results found - Advanced Archive Search

2 dead near Bethel when four-wheelers fall through river ice amid warnings to stay off

Zaz Hollander | Alaska News | April 1

Passers-by rescue children who fell through ice in Bethel

Associated Press | Rural Alaska | February 18

Volunteer search underway near Big Lake for missing snowmachiners

Madeline McGee | Alaska News | December 19, 2018

No sign of man who fell through ice on Western Alaska fishing trip

Zaz Hollander | Rural Alaska | November 9, 2018

Body found along Kuskokwim River identified as man who fell through ice 2 years ago

Kyle Hopkins | Rural Alaska | May 23, 2018

Father dies, 5 people rescued after family falls through river ice near Bethel

Anna Rose MacArthur, KYUK | Rural Alaska | January 2, 2018

Knowledge Exchange Meeting with elders from 4 YK Delta villages, Bethel AK N

(Frost-01)

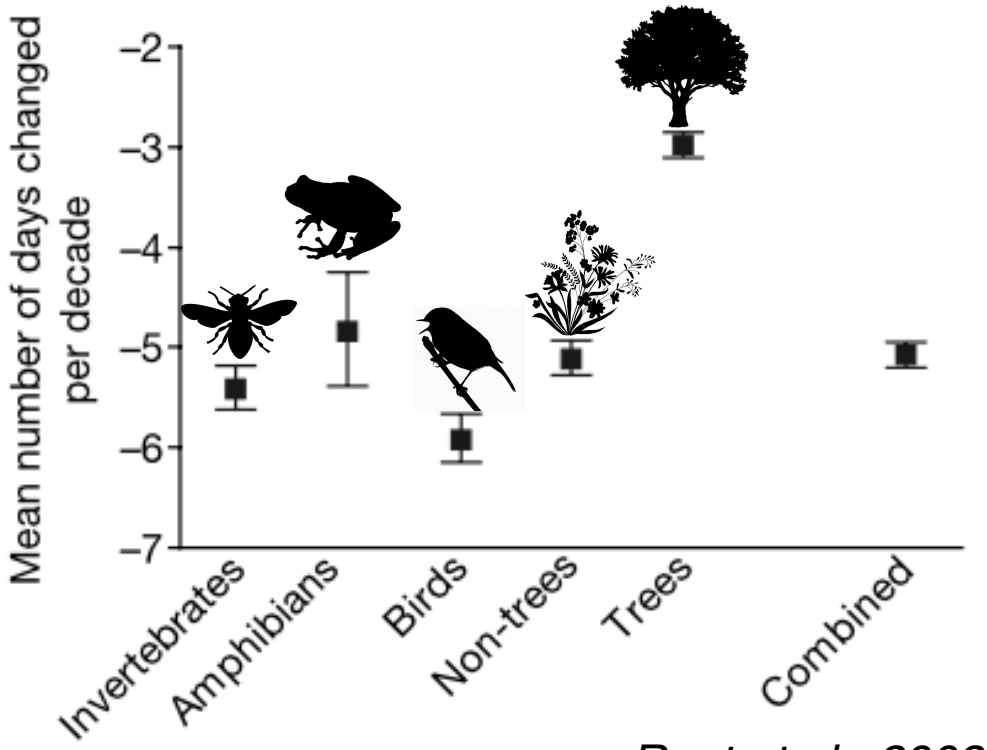
- *Shared findings and perspectives of project team and local knowledge holders*
- *Local knowledge provides unique, long-term context for understanding complex processes*

Phase 1

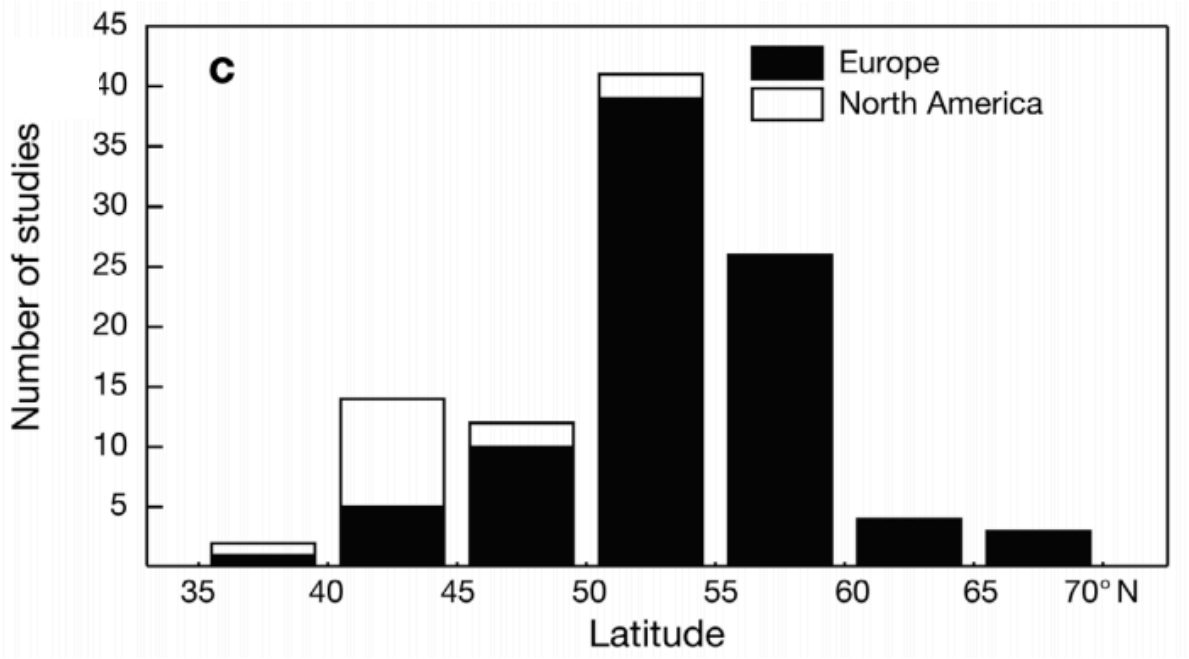
Multi-species analysis of spring phenology in large animals of Arctic-boreal N. America

animals on the move
(Boelman-01)

Phenological responses of large animals to climate change at high northern latitudes are largely unknown…



Root et al., 2003



Gordo, 2007

POSTER: **Animals on the Move:** Where, when & why have they been?

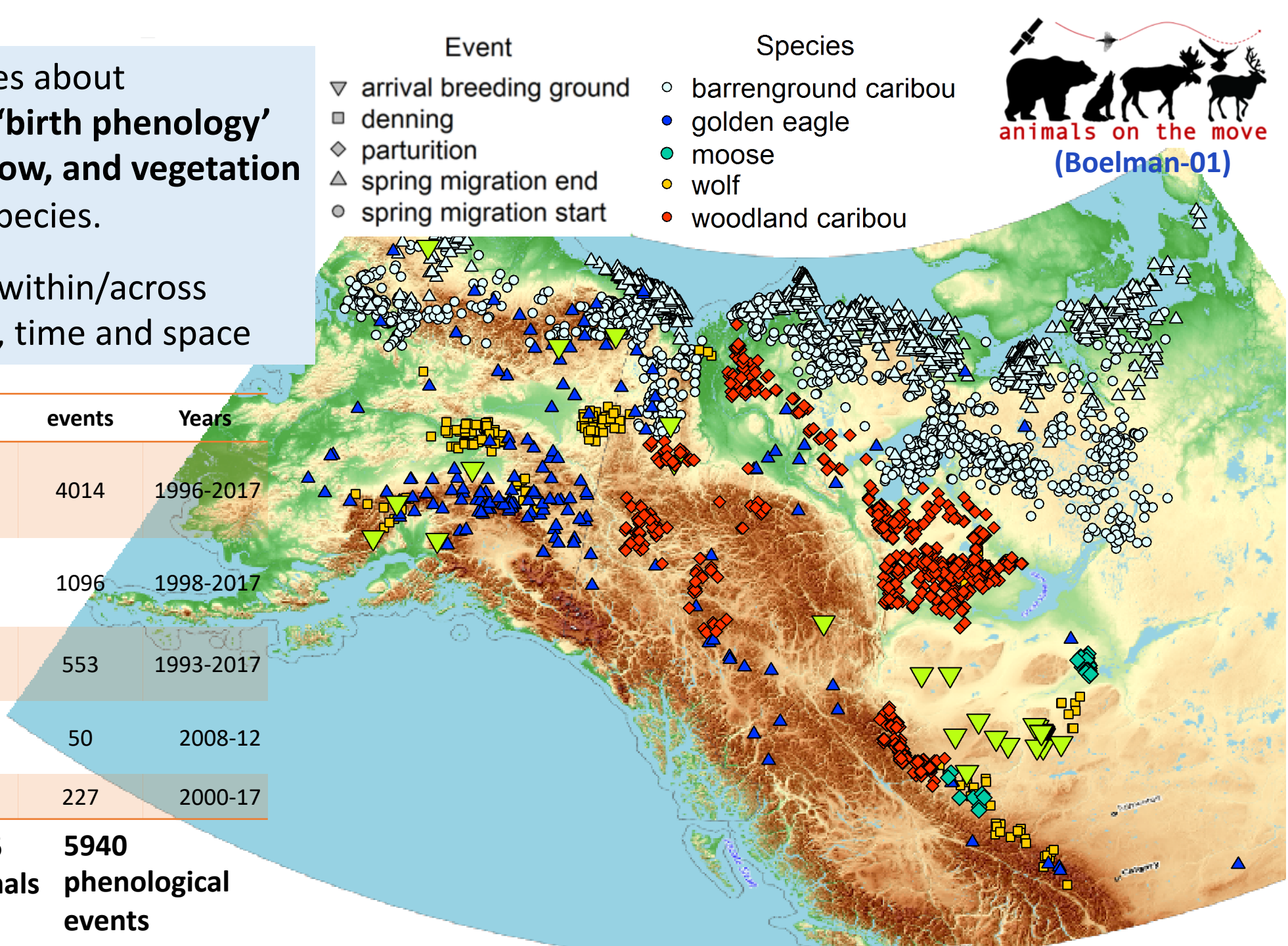
(caribou, wolves, robins and moose)

Phase 1

Goal: To test hypotheses about relationships between **'birth phenology' & weather/climate, snow, and vegetation** signals for 5 different species.

- compare & contrast within/across populations, species, time and space

Species	events	ind.	events	Years
Tundra caribou	Migration start and end	834	4014	1996-2017
woodland caribou	Parturition timing	684	1096	1998-2017
golden eagle	Migration end	98	553	1993-2017
moose	Parturition timing	32	50	2008-12
wolf	Denning	148	227	2000-17
		1796 animals	**5940 phenological events**	



animals on the move
(Boelman-01)

***Gurarie** et al. in prep.*

Phase 1

Arctic Animal Movement Archive

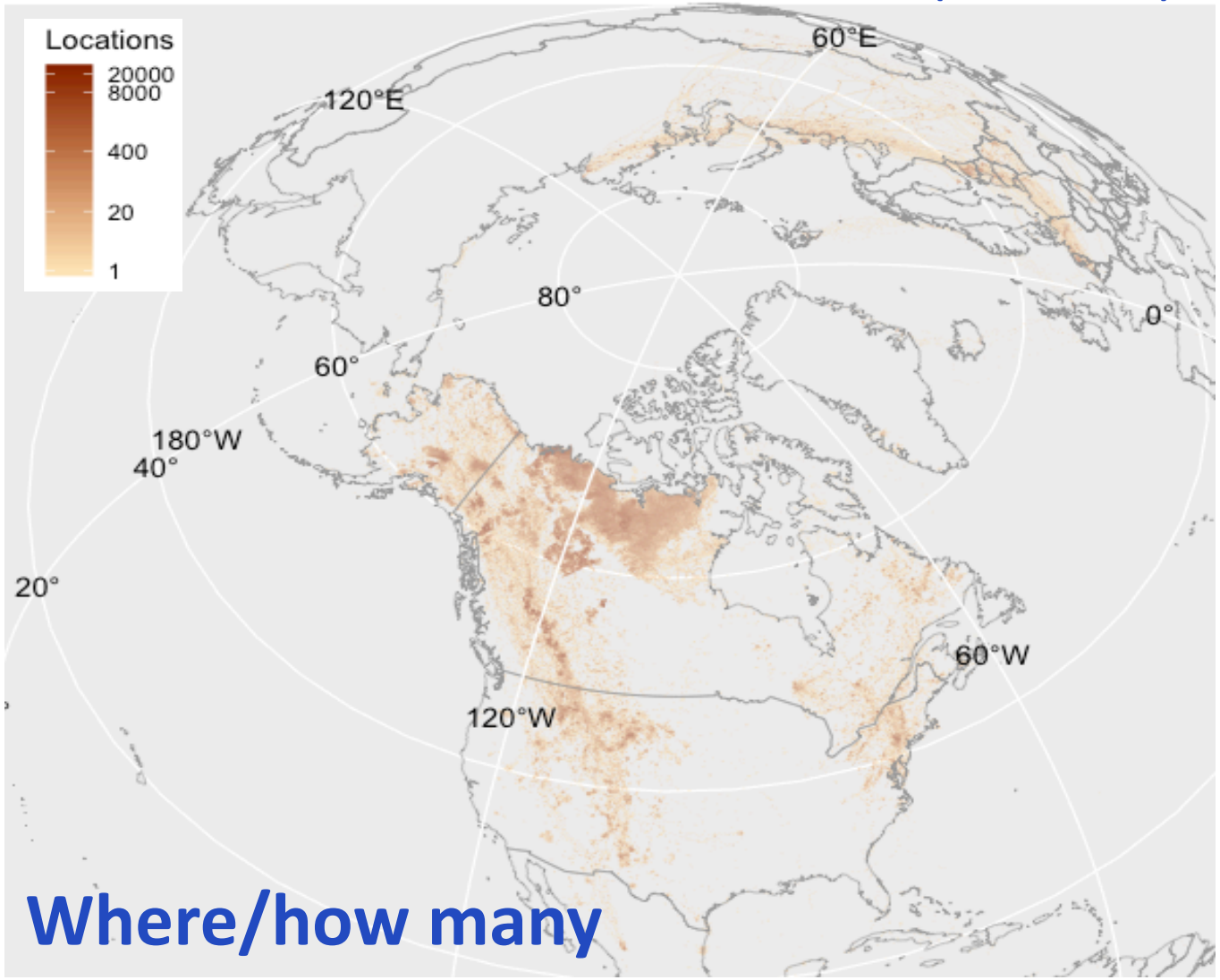
A living archive of ABoVE AotM participants and other Arctic data

animals on the move

(Boelman-01)

Goal: To enable long-term discoverability and collaborative re-use of animal movement data in ABRs.

- hosted at Movebank
- publicly discoverable
- study-specific access controlled by data owners
- dozens of participating organizations
- invitations & manuscript in progress
  - **case studies** to illustrate the potential of long-term, large-scale and multi-species data + env. covariates available via RS products and weather models.



Participating data as animal location density in 10-km hexagonal grid cells. Note log scale.

***Bohrer & Davidson** et al. in prep.*

Phase 1

Arctic Animal Movement Archive

A living archive of ABoVE AotM participants and other Arctic data

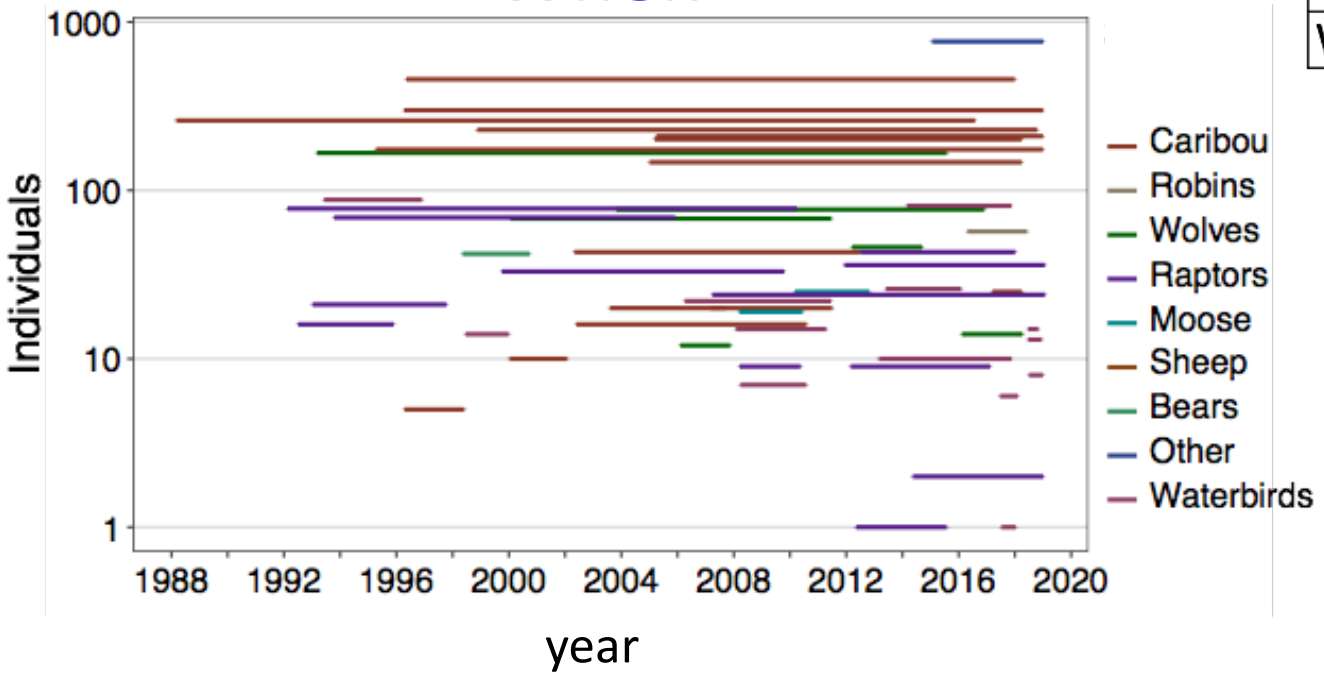
animals on the move

(Boelman-01)

	Locations	Animals	Projects
Total	**8,376,906**	**4,106**	**65**
Bears	66,659	42	1
Caribou	2,899,549	2,097	15
Moose	188,701	44	2
Raptors	931,433	390	15
Sheep	51,867	20	3
Songbirds	696	57	3
Waterbirds	3,653,708	1,072	20
Wolves	551,997	369	6

Who

When



***Bohrer & Davidson** et al. in prep.*

Thank you