

UiT

**THE ARCTIC
UNIVERSITY
OF NORWAY**

Mapping ecosystem services in the Arctic by cross-cultural mapping

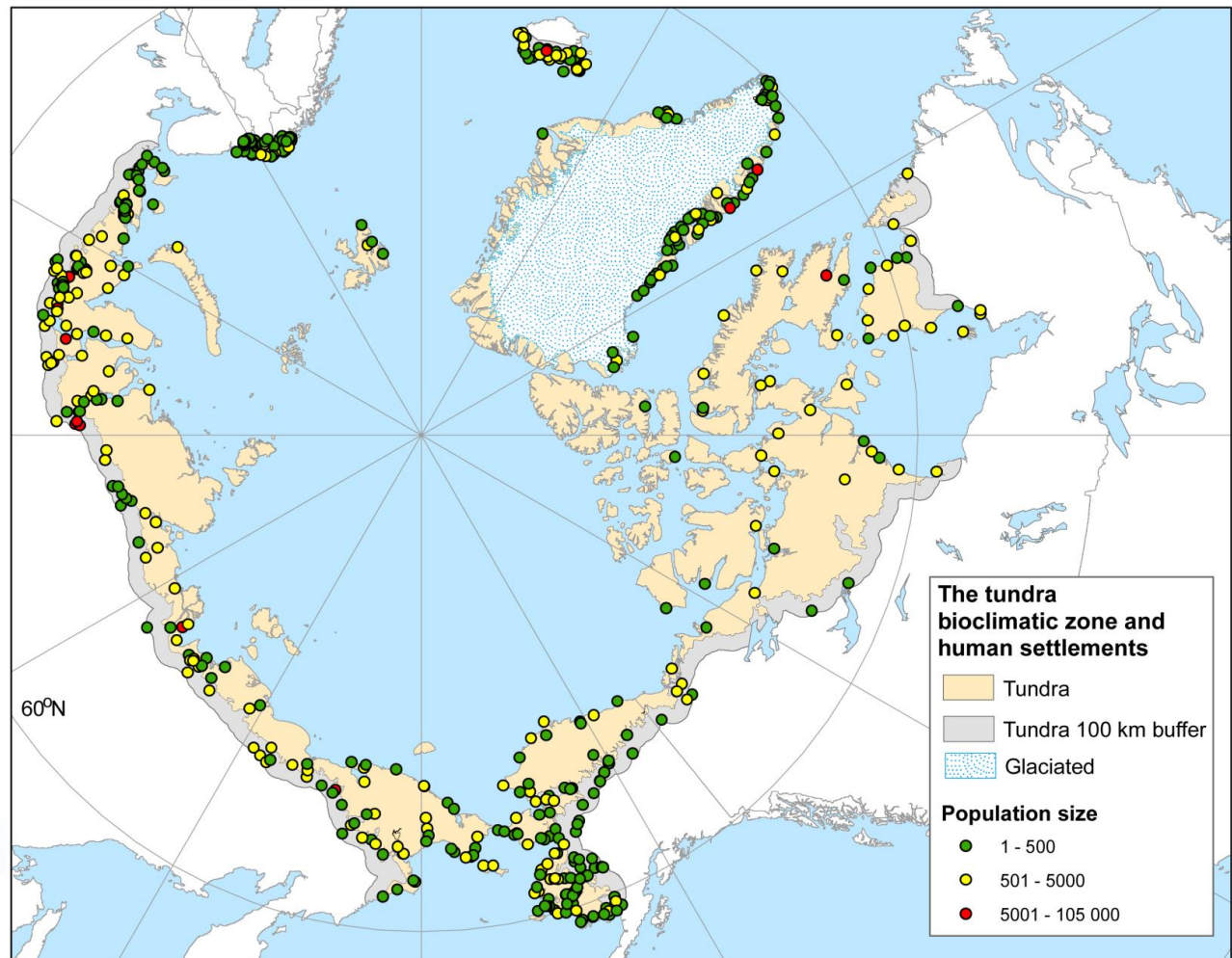


**Vera Helene Hausner
Jen Schmidt
Dorothee Ehrich**



Arctic coastal tundra: mostly small resource dependent communities on vast territories

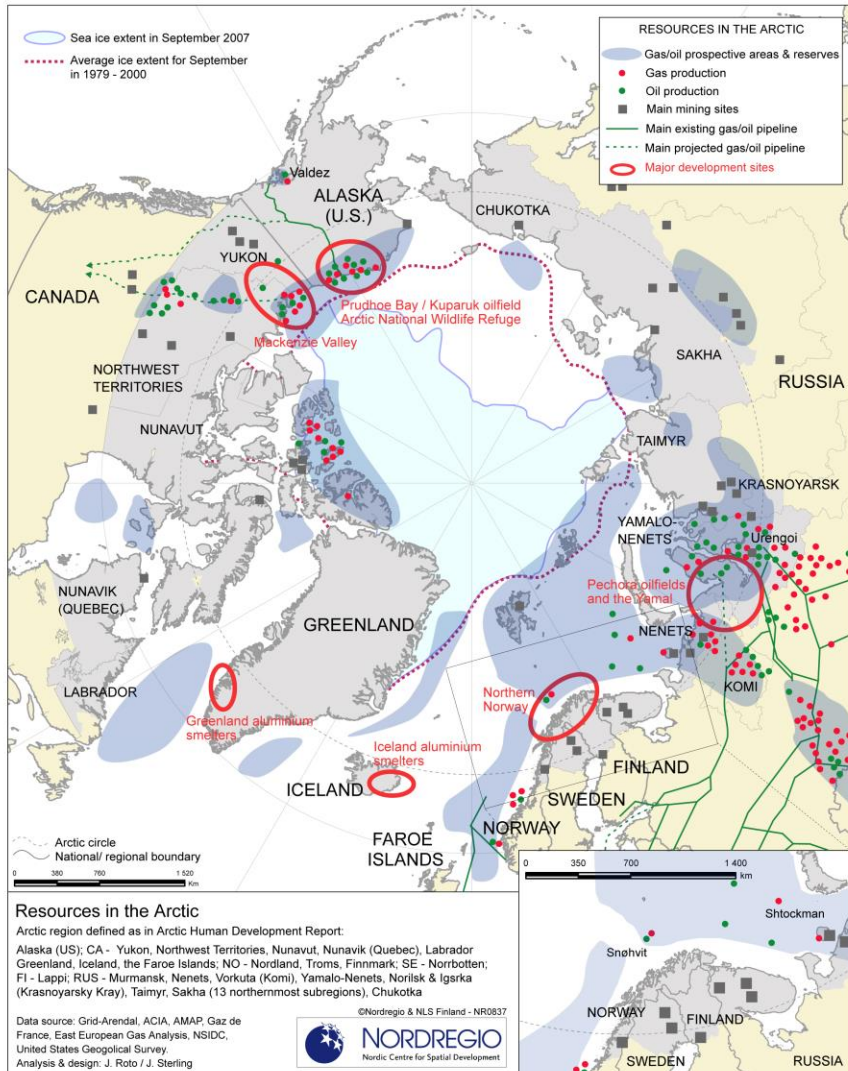
- 7 mill. km²
- **Green** = < 500 population size
- ~75% indigenous
- Ice-free areas – higher population densities and accessibility



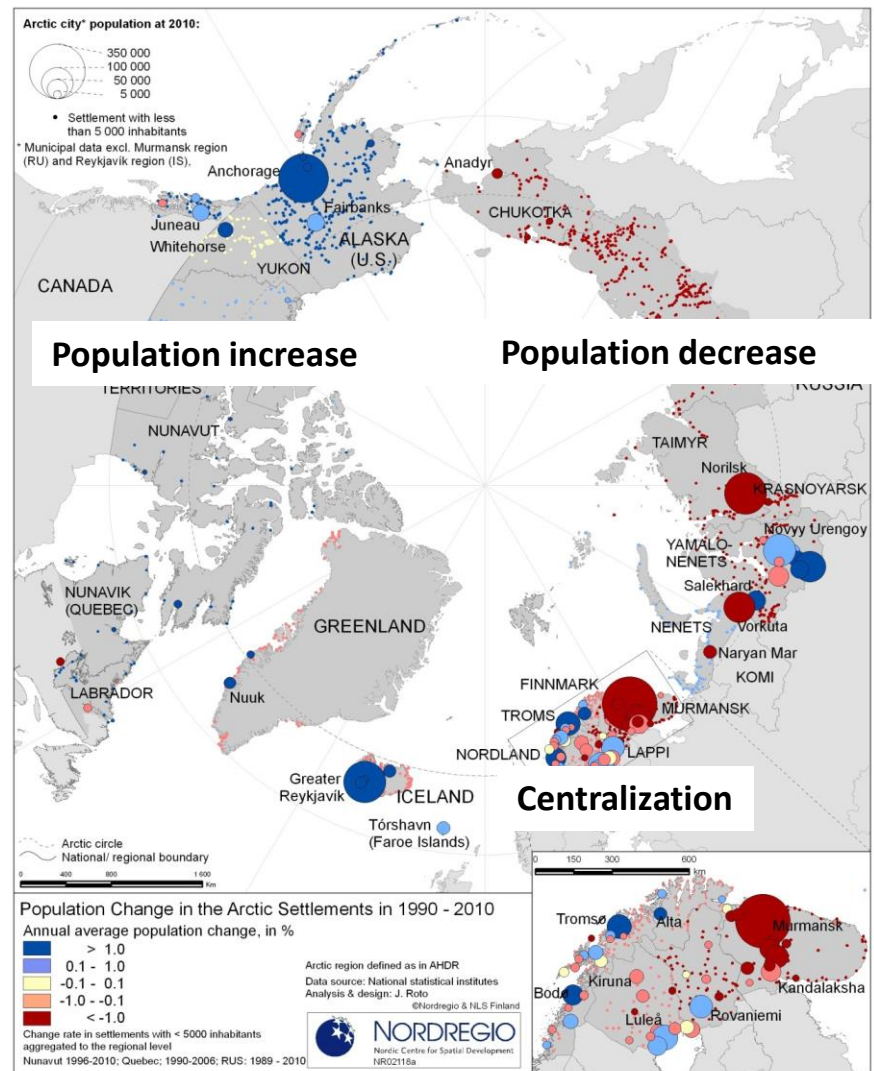
Data sources: Official Statistics from each country

Changes in Arctic communities affecting spatial land use

Industrial development

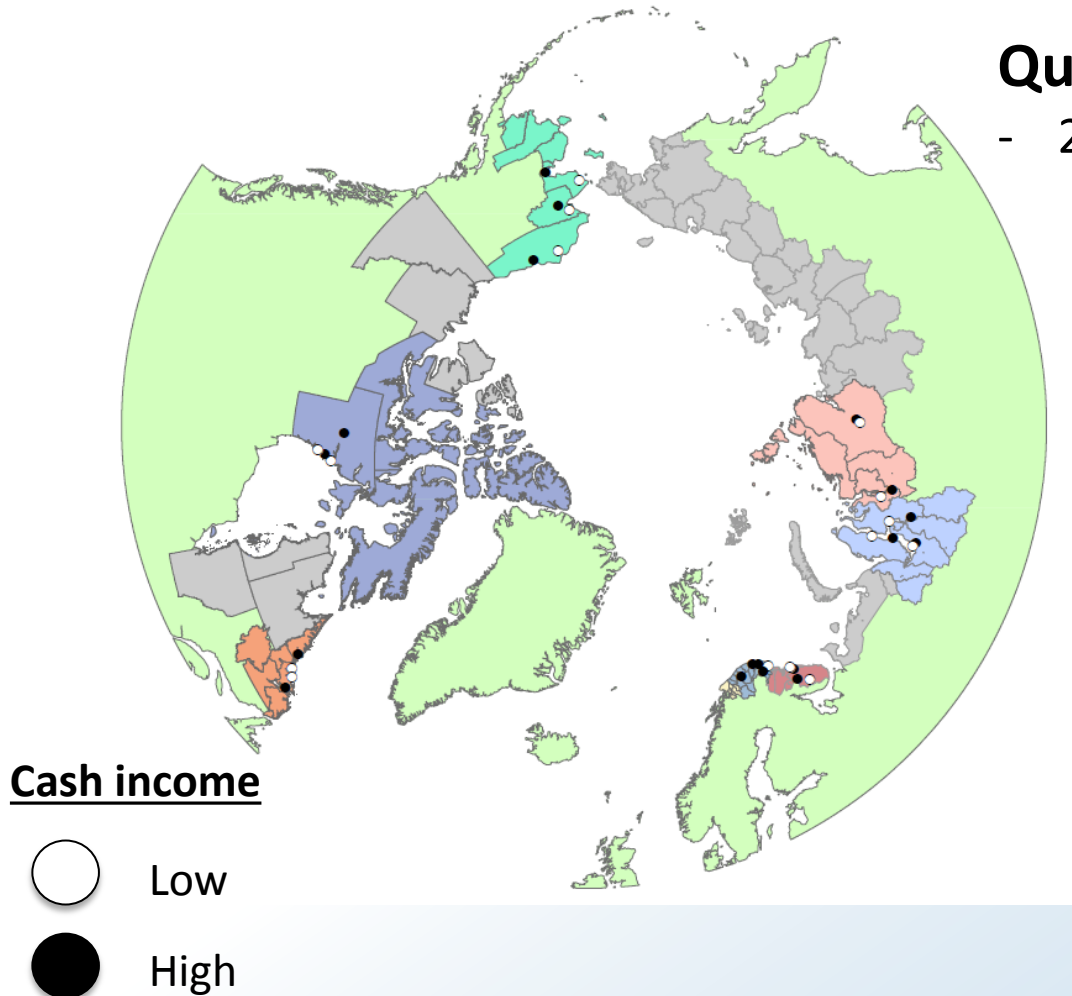


Demographic changes



OVERALL QUESTION IN TUNDRA:

How does governance and access to cash income influence spatial use and locally important ecosystem services?



Quasi experimental design

- 26 communities with contrasts in:
 - Governance
 - Access to cash income

This presentation:

Methodological challenges of cross-cultural mapping

Did we do PPGIS or PGIS, or just cross-cultural mapping of ecosystem services?

Characteristics of the mapping ecosystem services according to Brown and Kyttä (2014)

Characteristics	Mapping in our case	PPGIS	PGIS
Process emphasis	Causal, but desire to inform land use	Inform land use	Empowerment
Sponsors	Research Council	Government	NGO
Global context	Arctic region	Developed	Developing
Place context	Multiscale	Urban and regional	Rural
Data quality	Comparability	Primary	Secondary
Sampling	Key-informant, heterogeneity	Probability	Purposive
Data collection	Individual followed by workshops	Individual	Collective
Data ownership	Research consortium and community	Sponsors	Community
Mapping	Paper mapping, three scales	Digital	Non-digital

Key informants and cross-cultural mapping



Demography		Leaders	Active	Total
Male	Younger	2	2	4
	Elders	2	2	4
Female	Younger	2	2	4
	Elders	2	2	4
Total		8	8	16

Quota sampling (2 weeks)

Sampled to maximise heterogeneity among participants

Community involvement

- Avoid helicopter research
- Visited key local leaders first
- Community workshops for feedback



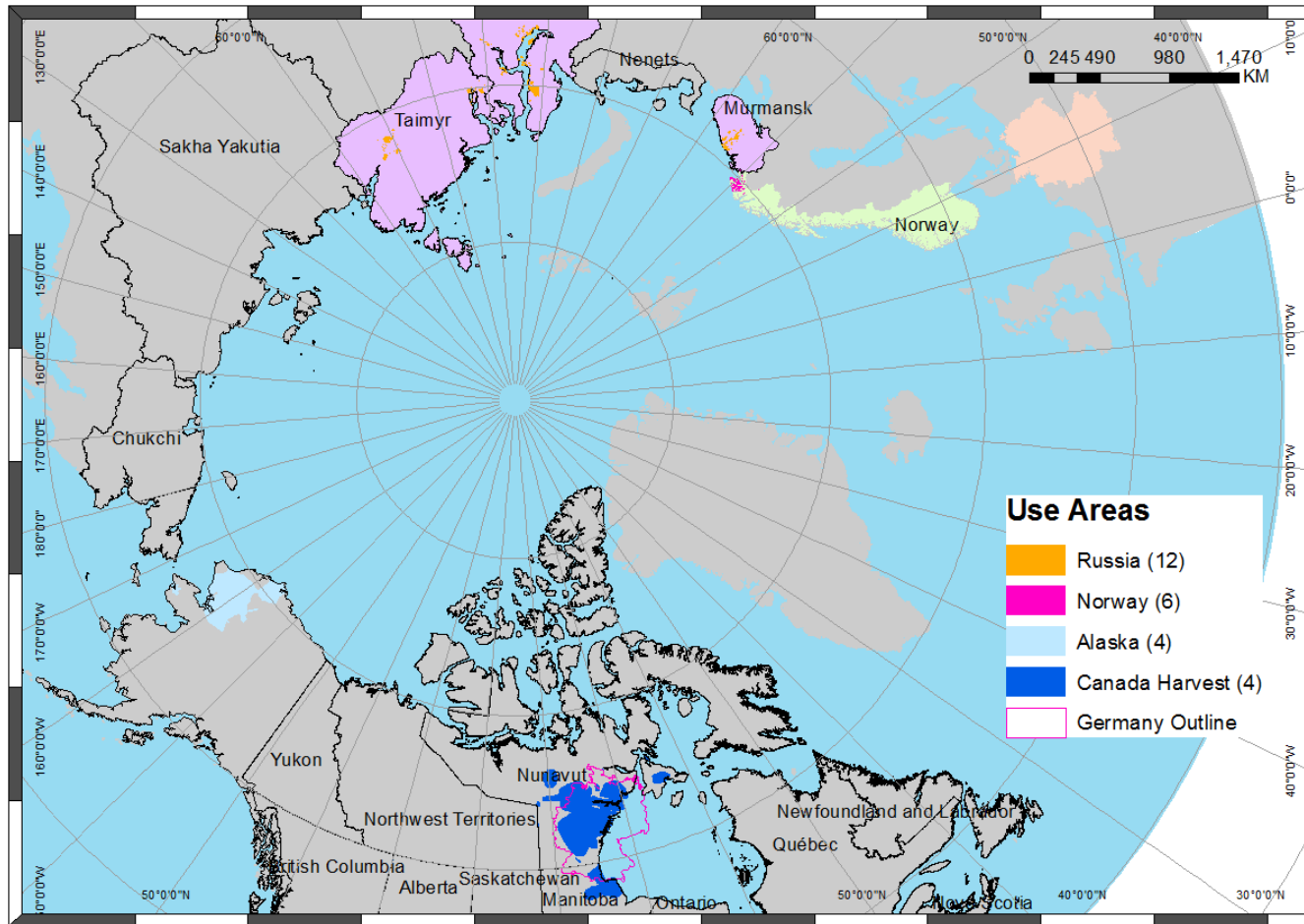
Inductive, but comparative approach to mapping

1. **Started** with places visited and activities the last year to make it comparable across cultures?
2. **Next** we mapped important places, that were not visited last year.
3. **Finally** participants ranked the importance of 5 places explaining why they were important for them.



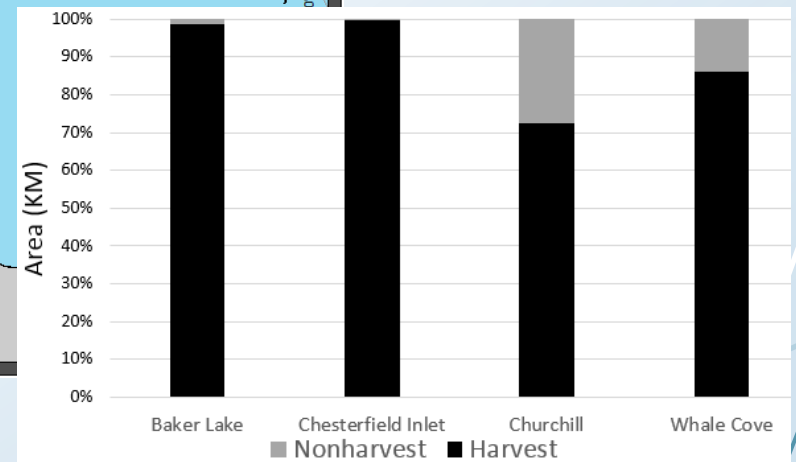
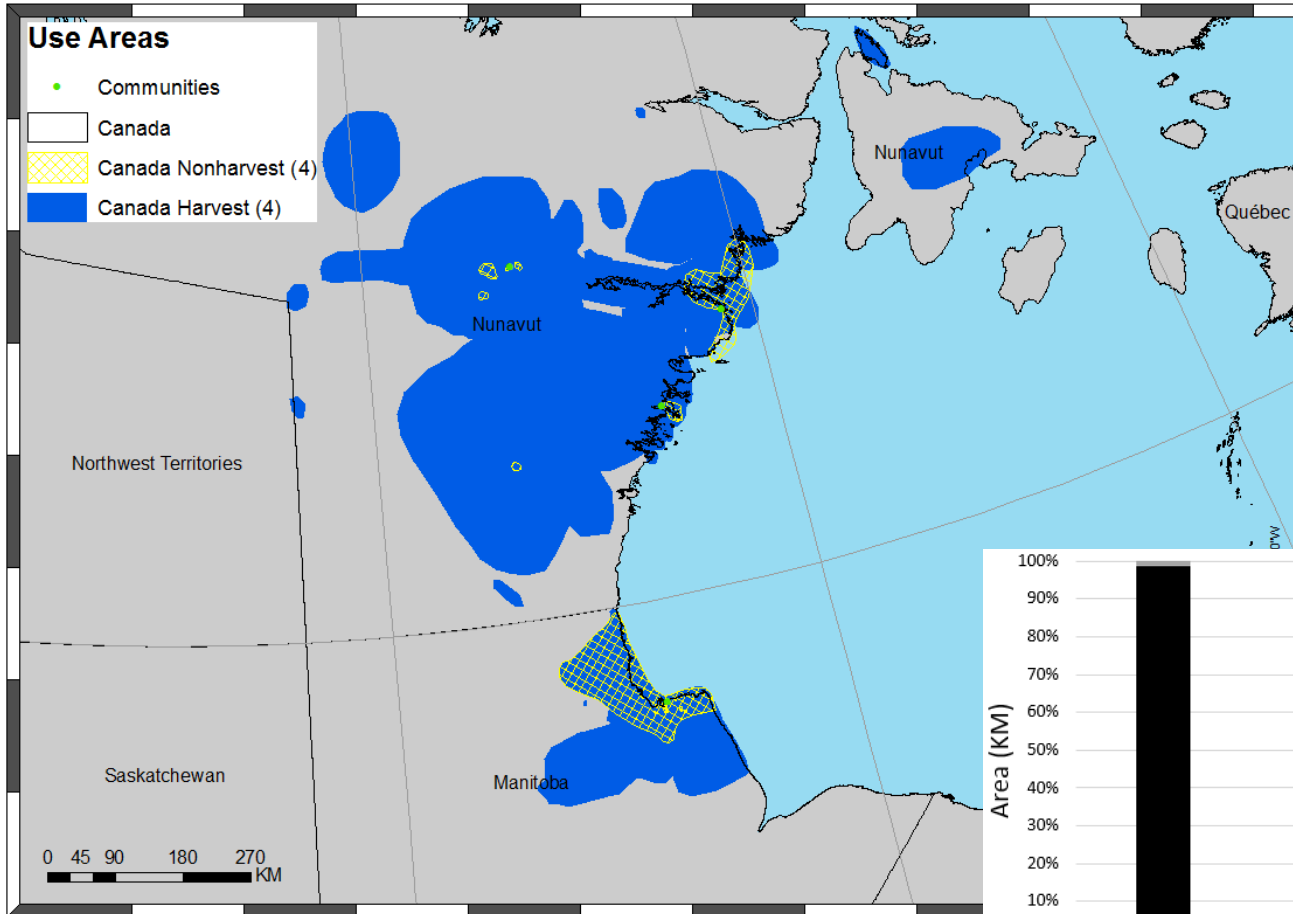
Those participating in designing interviews were field leaders to ensure comparability

Challenge 1 Extensiveness: Use areas for just four small subsistence communities in Canada is almost the size of Germany



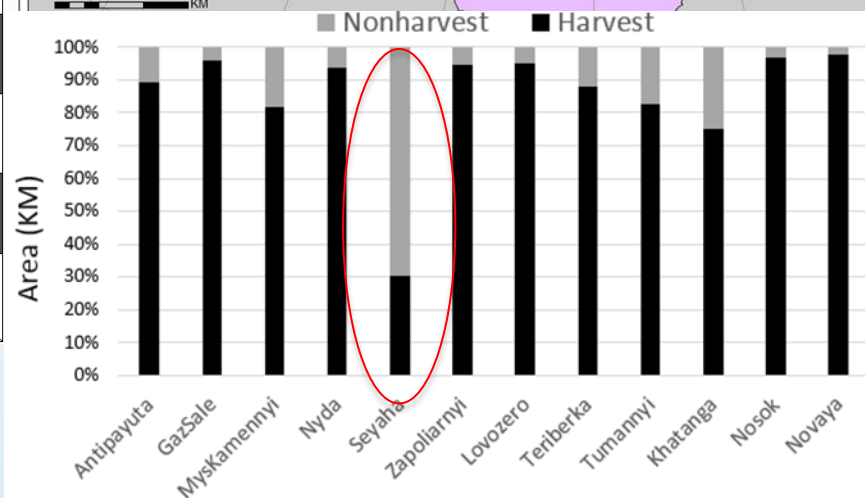
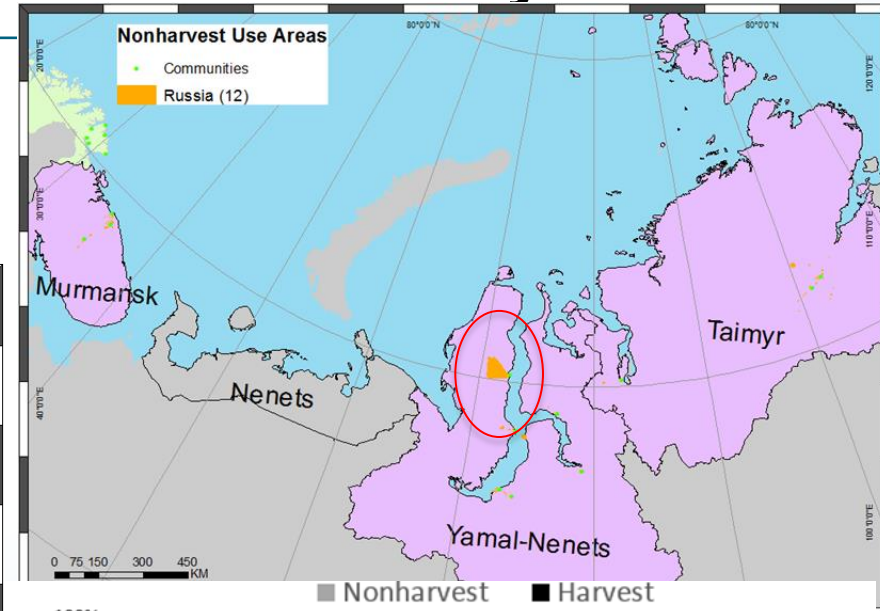
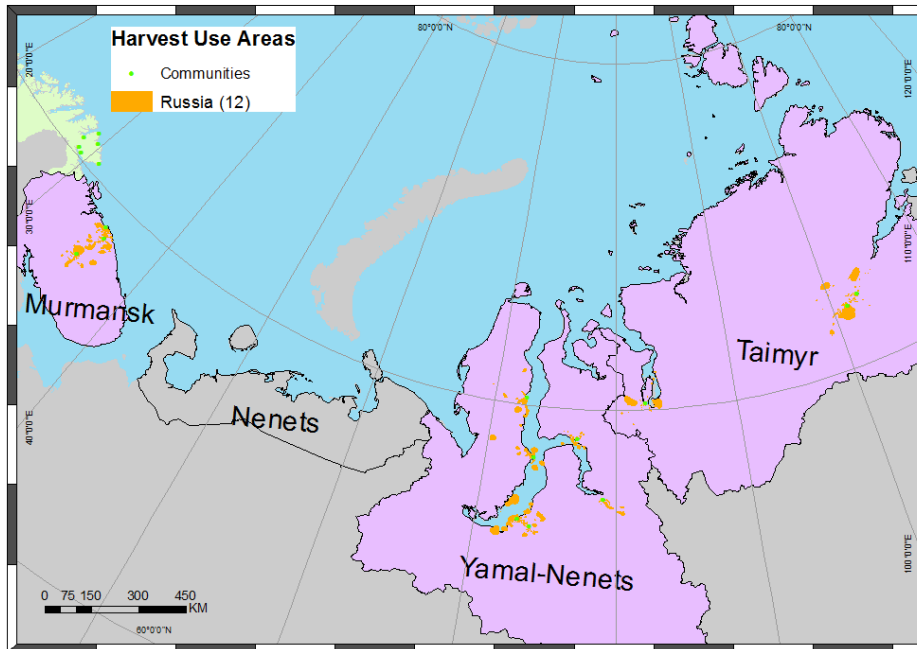
Ratio between
Harvest/Non
harvest to
control for area

Harvest vs non-harvest show that Churchill in Manitoba has more non-harvest activities going on due to tourism.



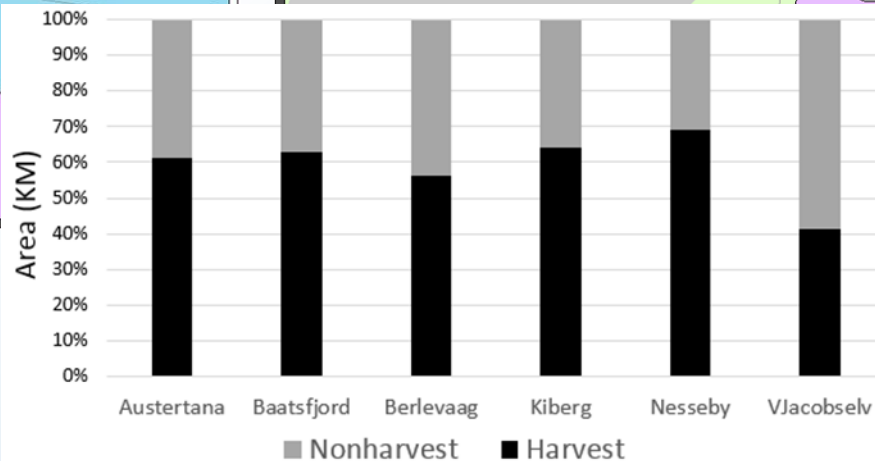
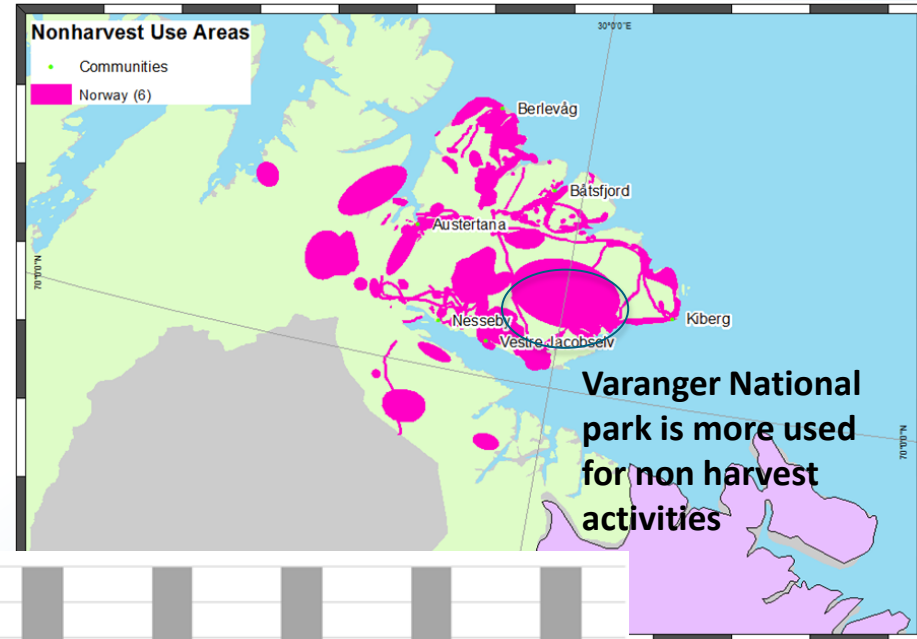
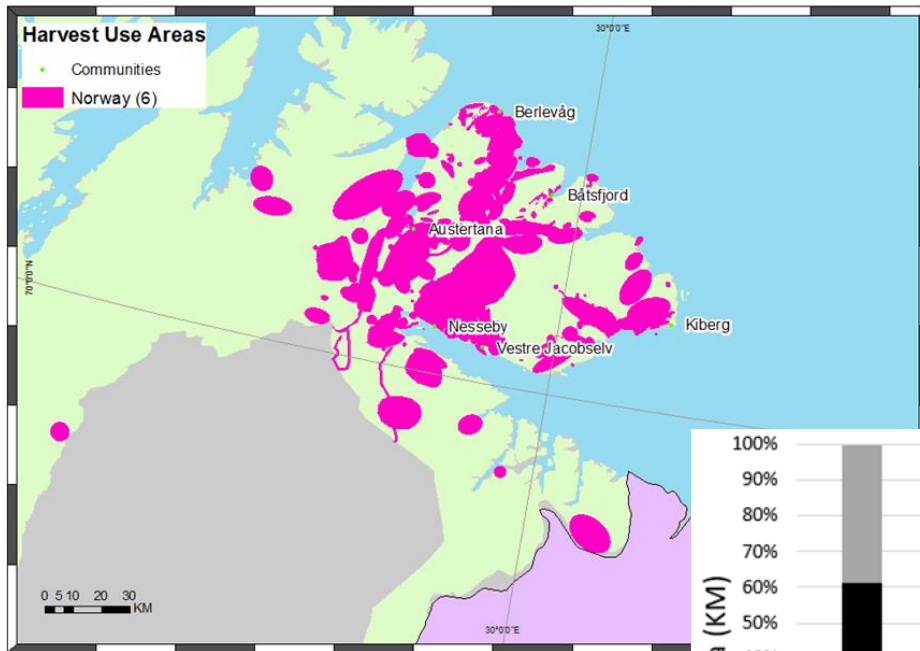
Challenge 2: Few key informants could change the harvest/non-harvest ratio substantially

In Seyaha (Russia) – extensive use of one nature photographer change the ratio substantially



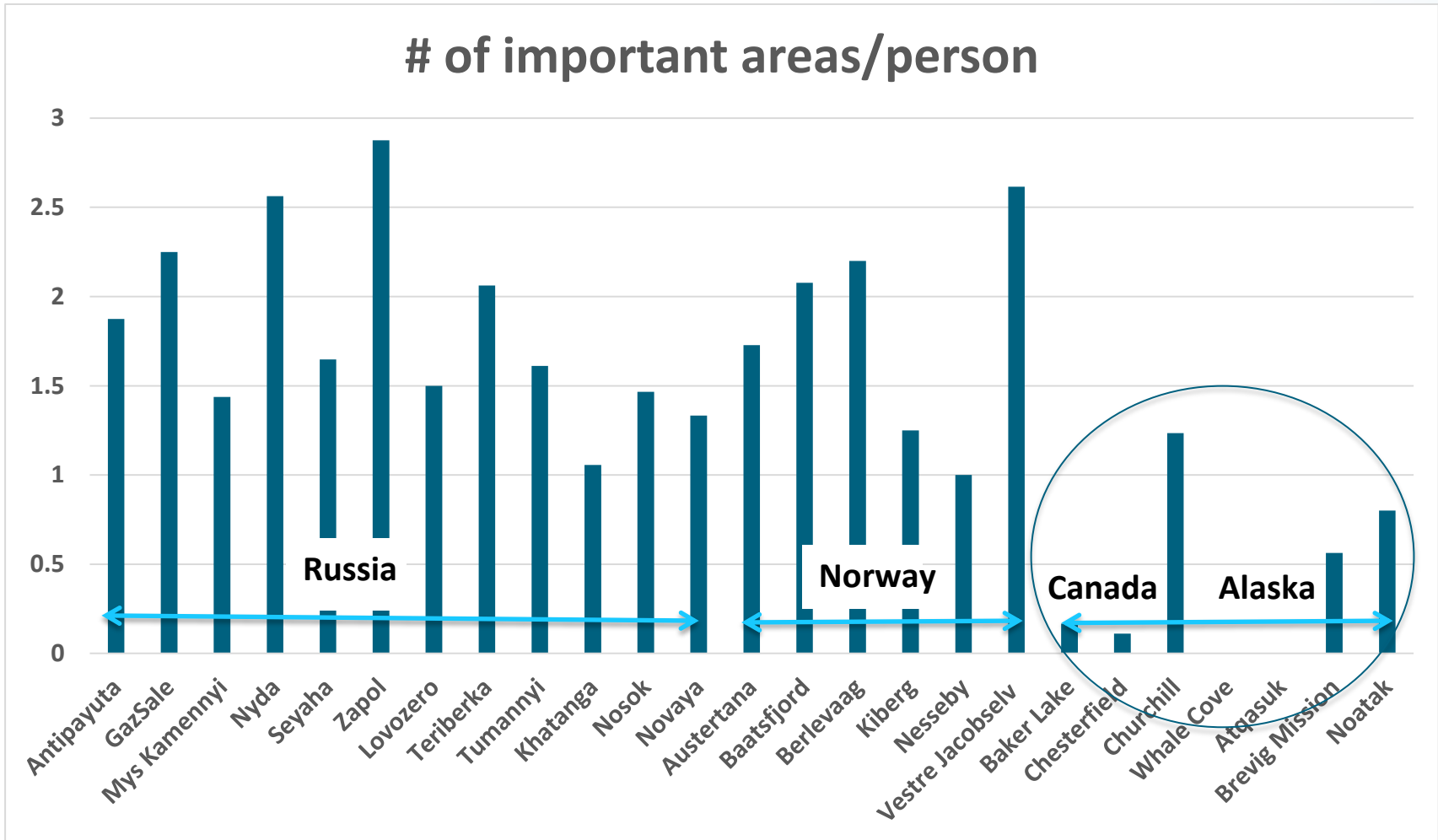
Challenge 3:

In Norway we have much higher diversity of recreational use and large overlap among users.



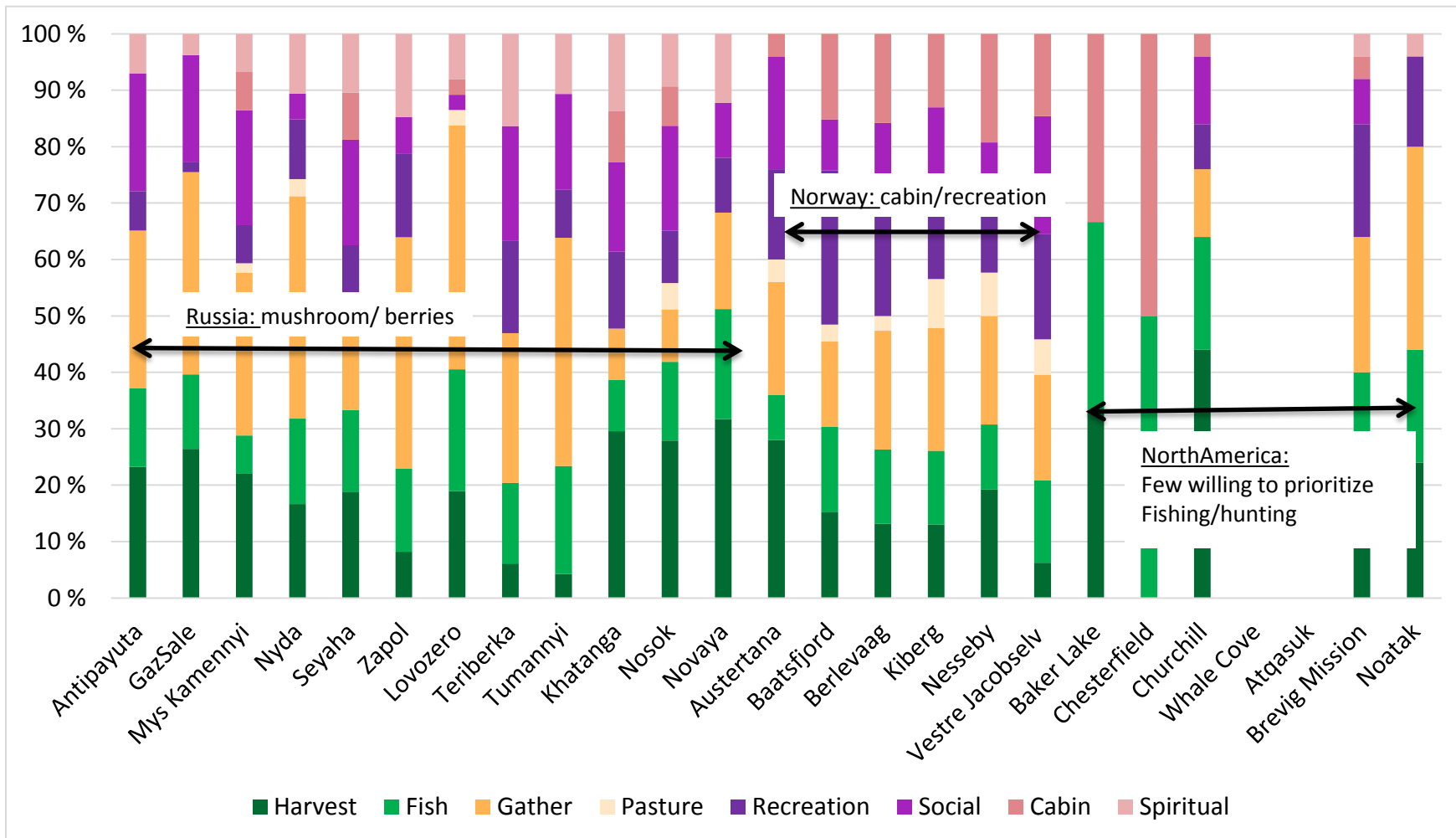
Challenge 4:

Most people included less than 3 places on the priority list, and especially in North America people don't see the point of prioritising among areas



Categories of ecosystem services identified as important in the top places

Categories of ecosystem services mapped by key-informants in the communities





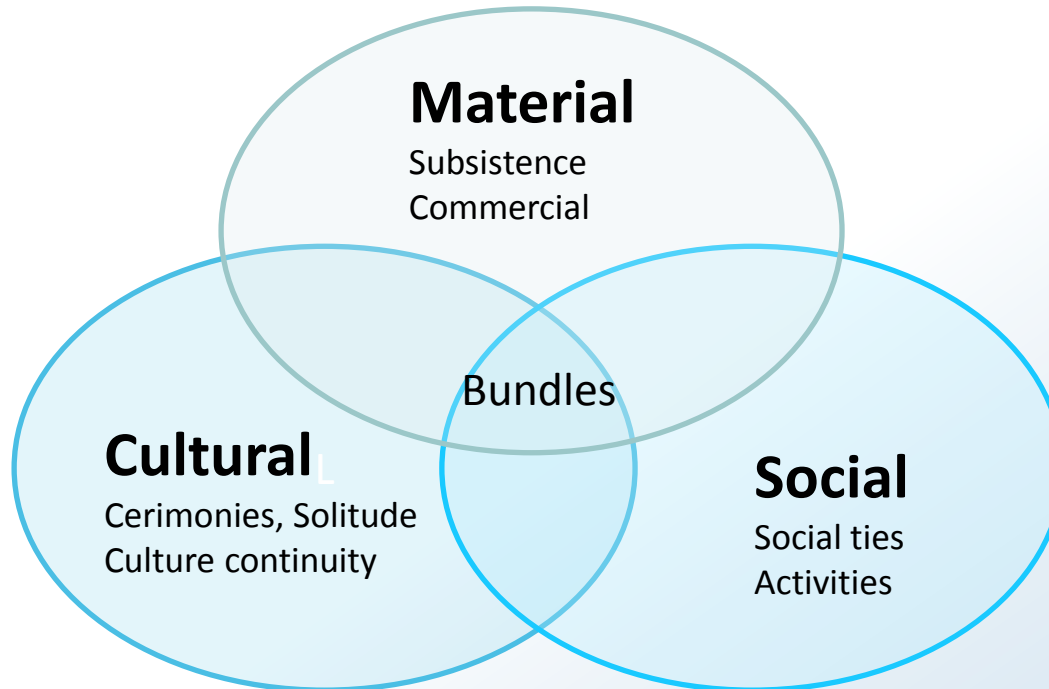
Harvest, social and cultural values are interconnected:

Visiting friends and family in tundra, camps often for several week, while participating in harvest activities is important for people

No sharp border between nature use and social activities



Challenge 5: interconnectedness among ecosystem services



Nvivo – qualitative coding of why top places are important, including heterogeneity among individual users

THANK YOU!

TUNDRA TEAM - DESIGN

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ALL FIELD WORKERS AND CONTRIBUTORS