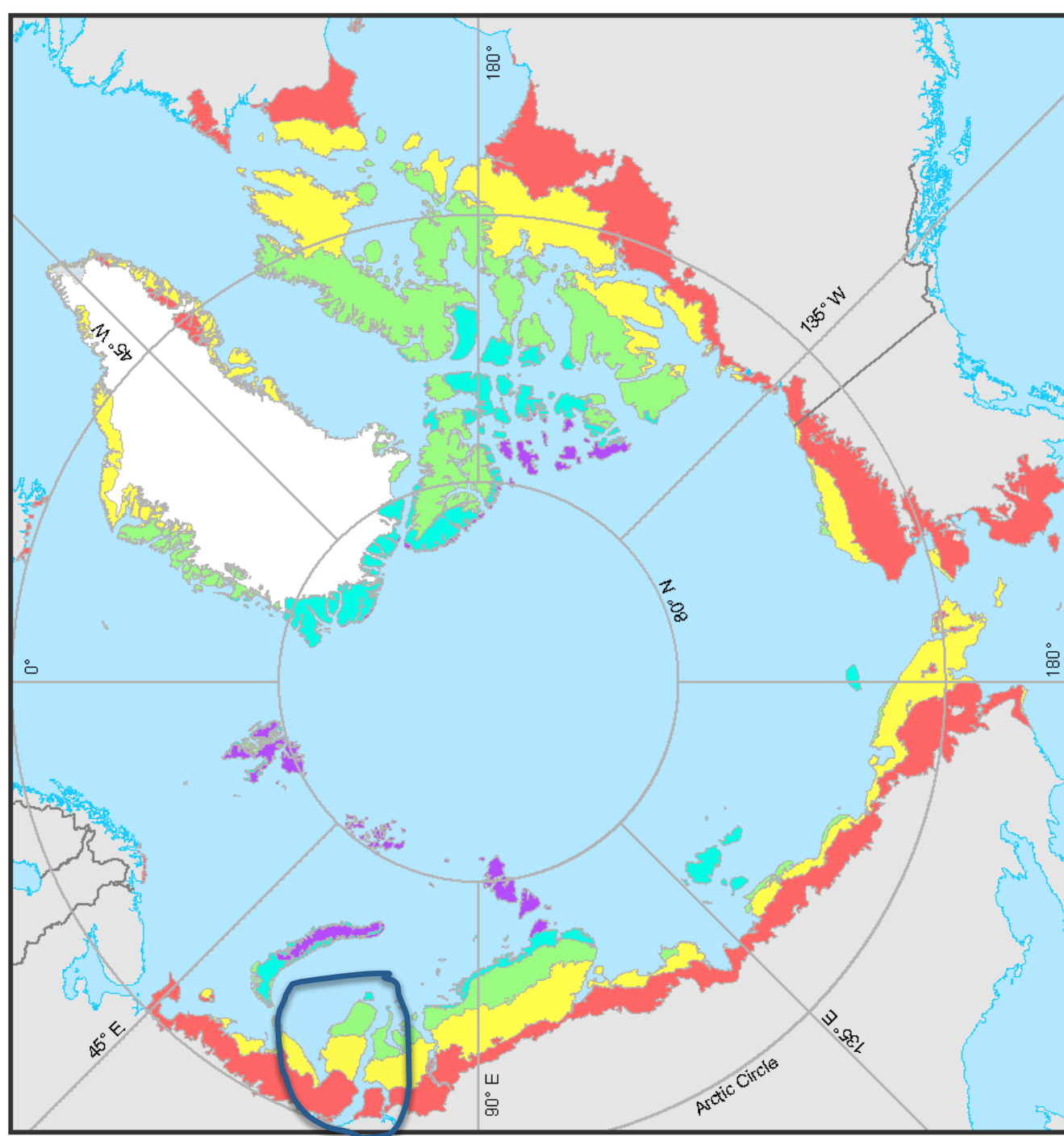


Terrestrial biodiversity monitoring in Yamal, Russia: from past experience to future perspectives

A.Sokolov, N.Sokolova, V.Shtro, D.Ehrich
Arctic Research Station, IPAE UB RAS, Labytnangi,
Russia

Scientific Center for Arctic Studies, Salekhard, Russia
University of Tromsø – The Arctic University of Norway



- Geographic location of Yamal Peninsula
- On the border of Europe and Asia
- Cross point for species with southern-northern and European-siberian distribution



- Uninterrupted latitudinal gradient with different bioclimatic subzones of similar width, and in similar landscape



Logistic possibilities

- Railway —
- airports (planes and helicopters) ●
- water transport by Ob' river and "Northern sea route"



- Rich gas and oil fields – fast industrial development



- More than 40 000 indigenous people (growing). 50 % of them are nomads – reindeer herders. Nearly 600 000 of reindeers

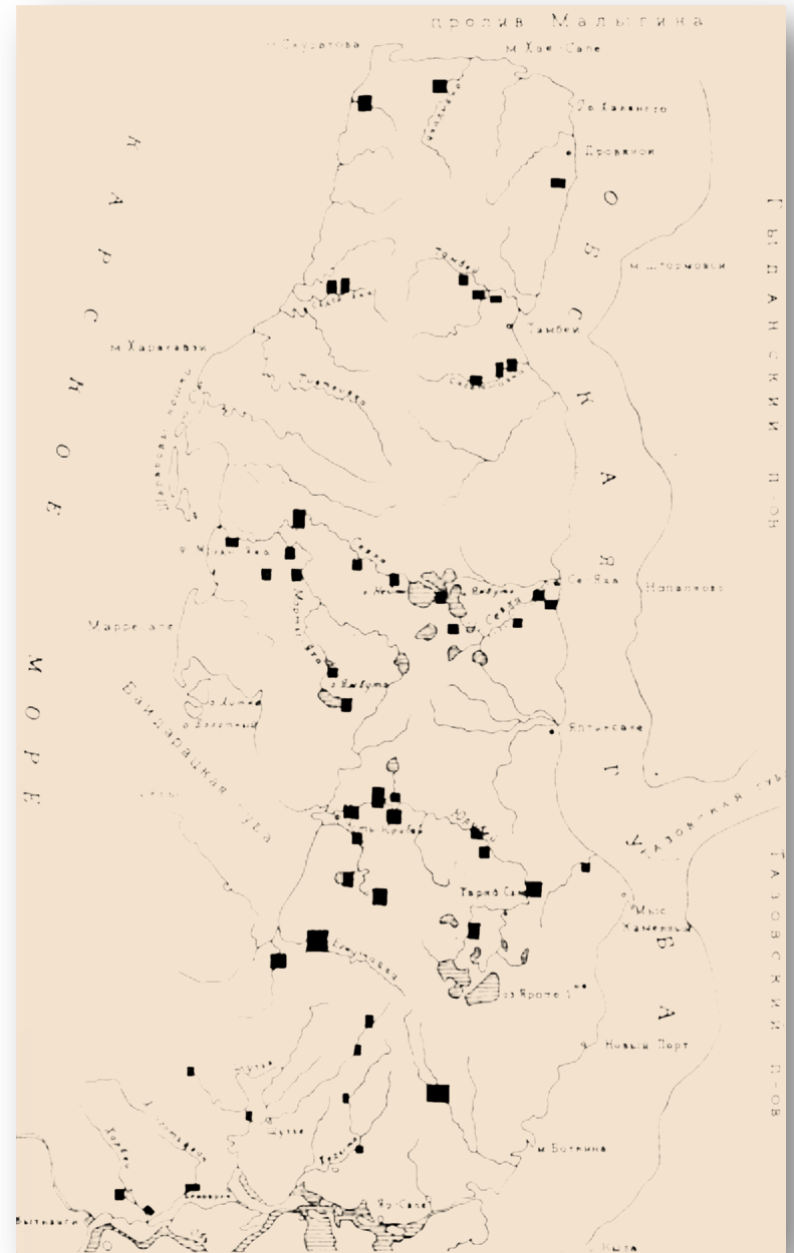
Arctic Research Station of Russian Academy of Sciences in Labytnangi



- Established in 1954, run year-round (N 66°39')
- Own staff of researchers (5), and base for core Institute (150 researchers)
- Tundra, Taiga, Polar Ural, Lower Ob' Delta in close vicinity
- Own equipment (6WD tracks, ship, boats etc.)
- Involvement on IBP (1960)
- Participant of IPY
- Member of EU-INTERACT

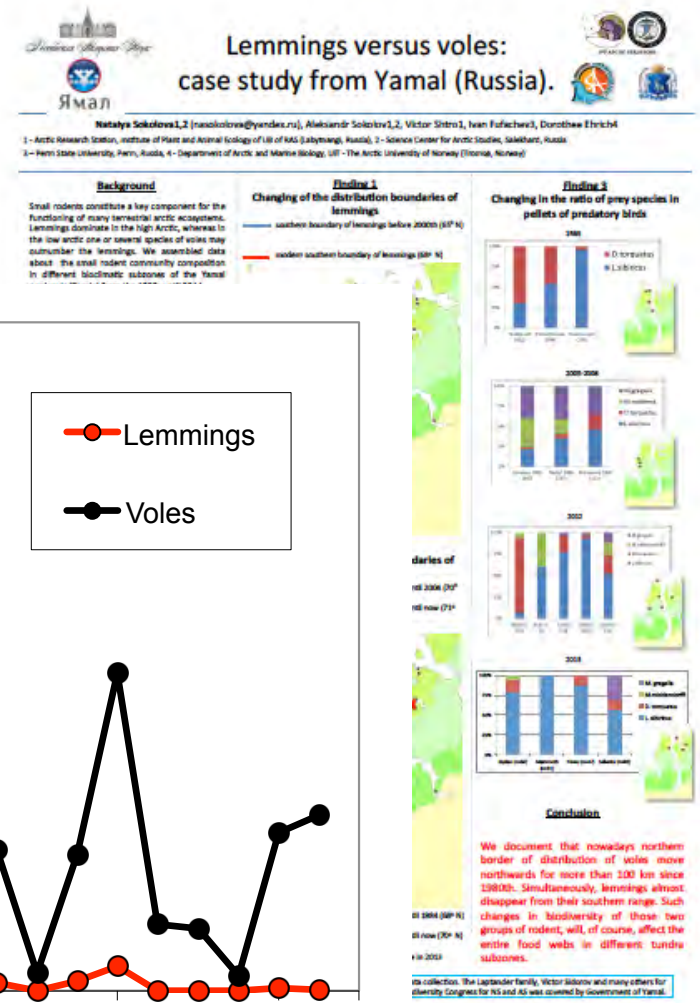
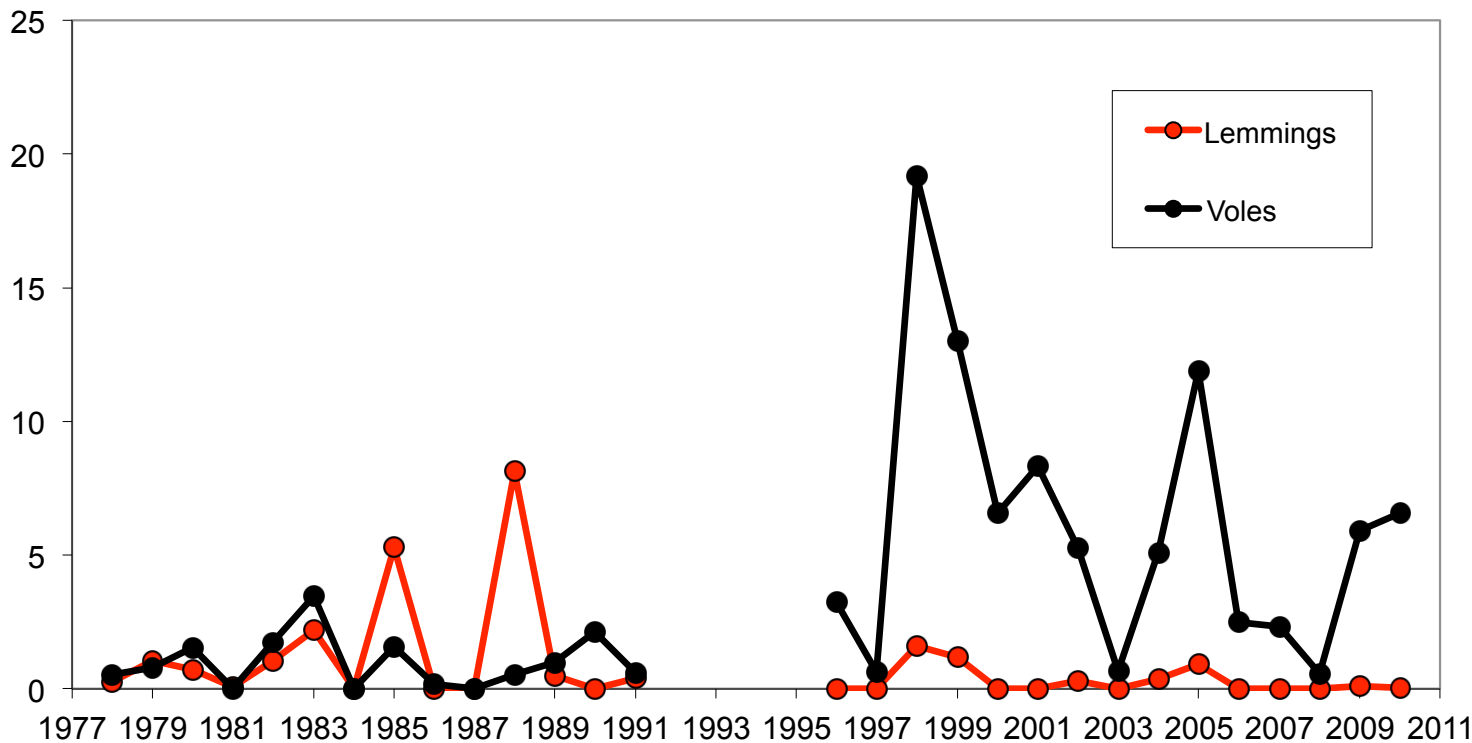
Long-term data

- Biodiversity of birds, mammals, fish, plants
- Monitoring on year-round basis
- Mainly note for birds and mammals (rodents and arctic fox)
- Mostly “species-specific” approach

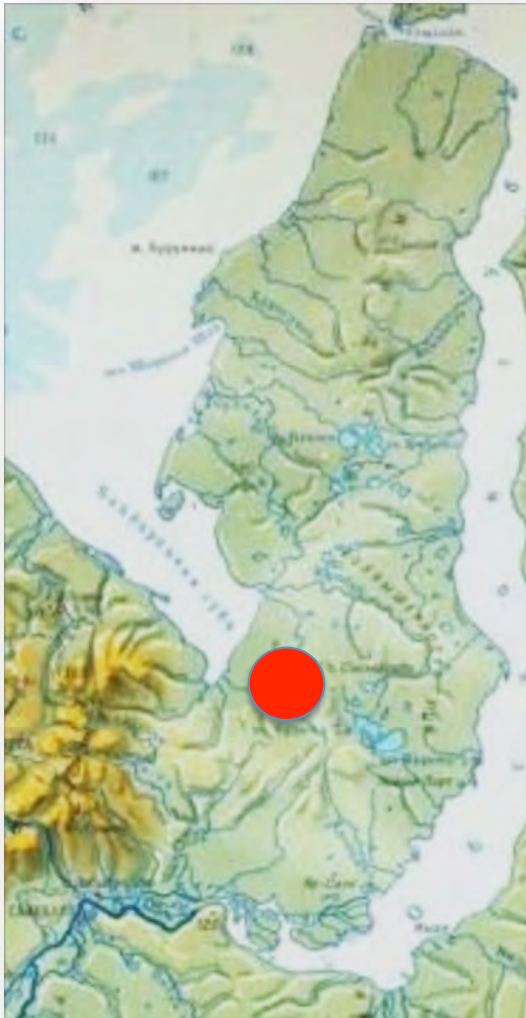


Example of long-term trends

- Rodent data (poster of Sokolova et al.)



Erkuta tundra monitoring site



- Long-term monitoring (species-specific since 1999, more ecosystem-based since 2007)
- Ecosystem based approach with a food web approach (terrestrial so far)
- Wide International collaboration
- Using detail protocols which were widely discussed before field work. Constantly adapted.
- Using innovative methods (satellite telemetry, automatic cameras) - developing!
- Sister field-site in COAT initiative

Erkuta tundra monitoring site



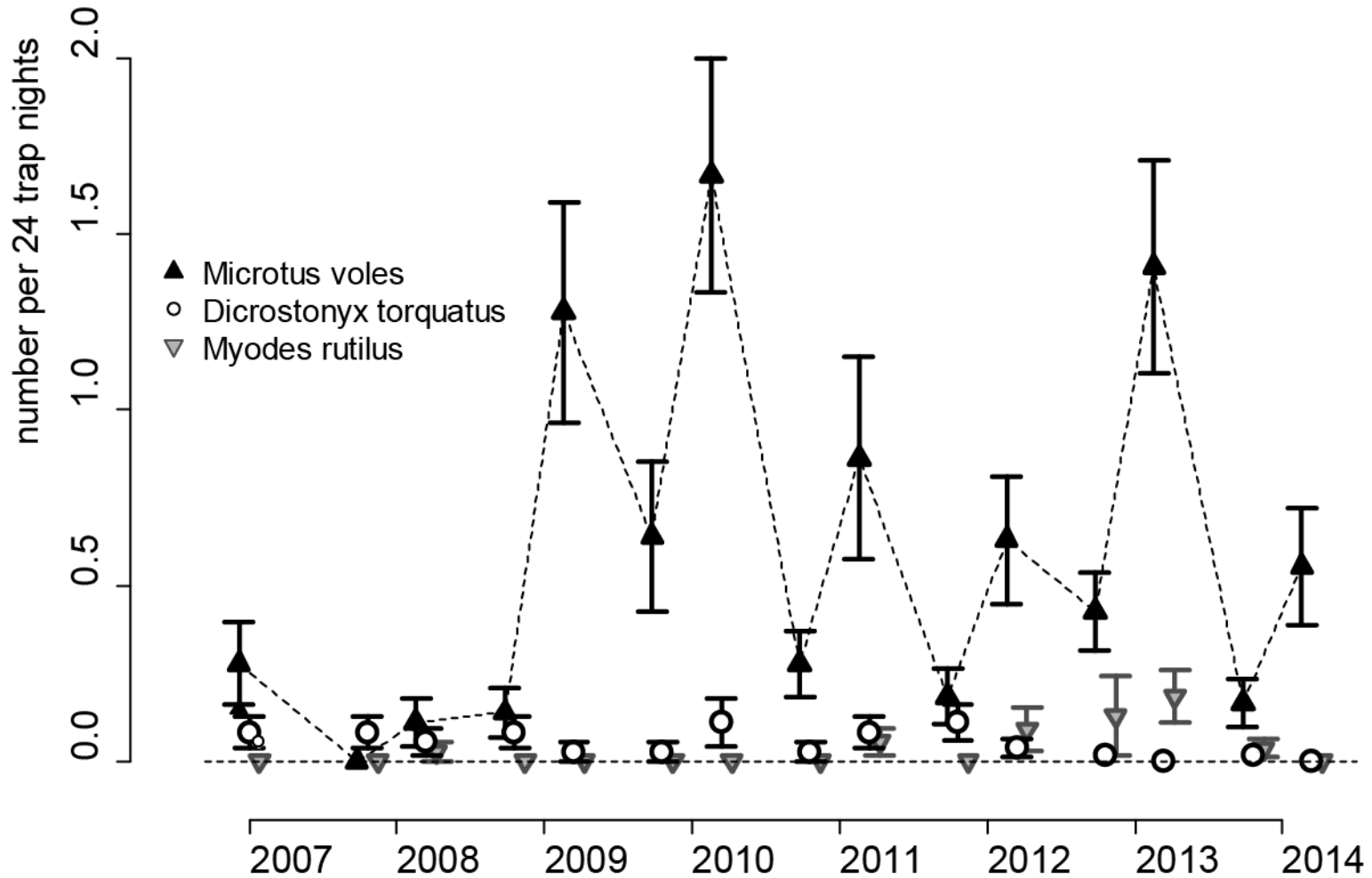
Young researchers and local people involved

Erkuta tundra monitoring site



Public outreach

Erkuta results

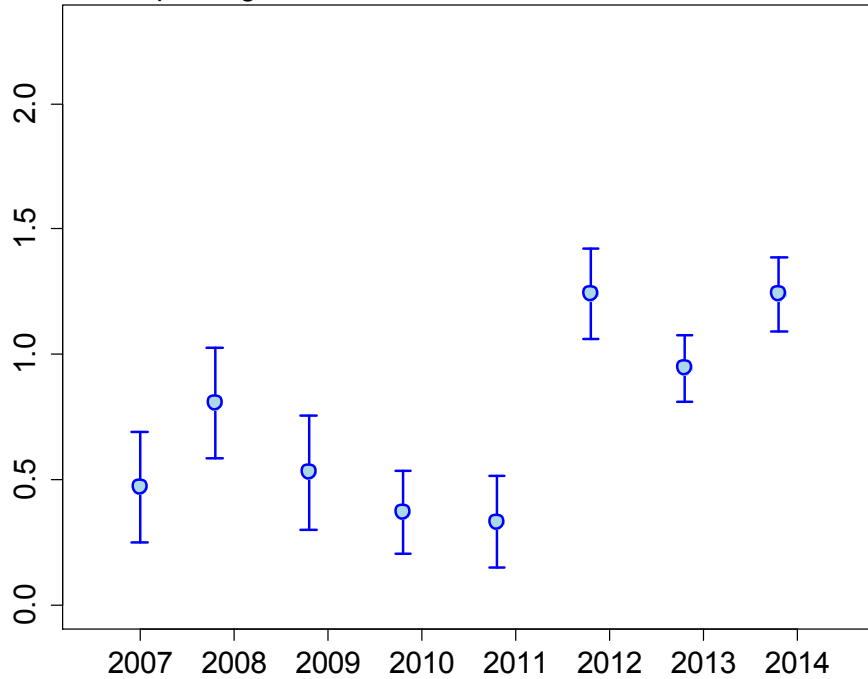


- Rodents data (dynamic, species composition)

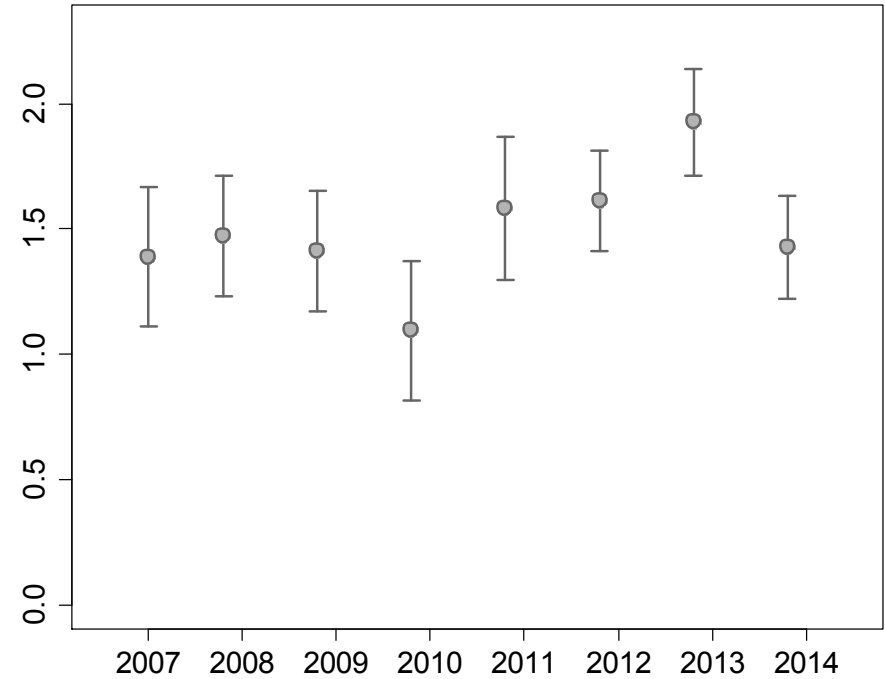
Erkuta results



Yamal ptarmigan mean

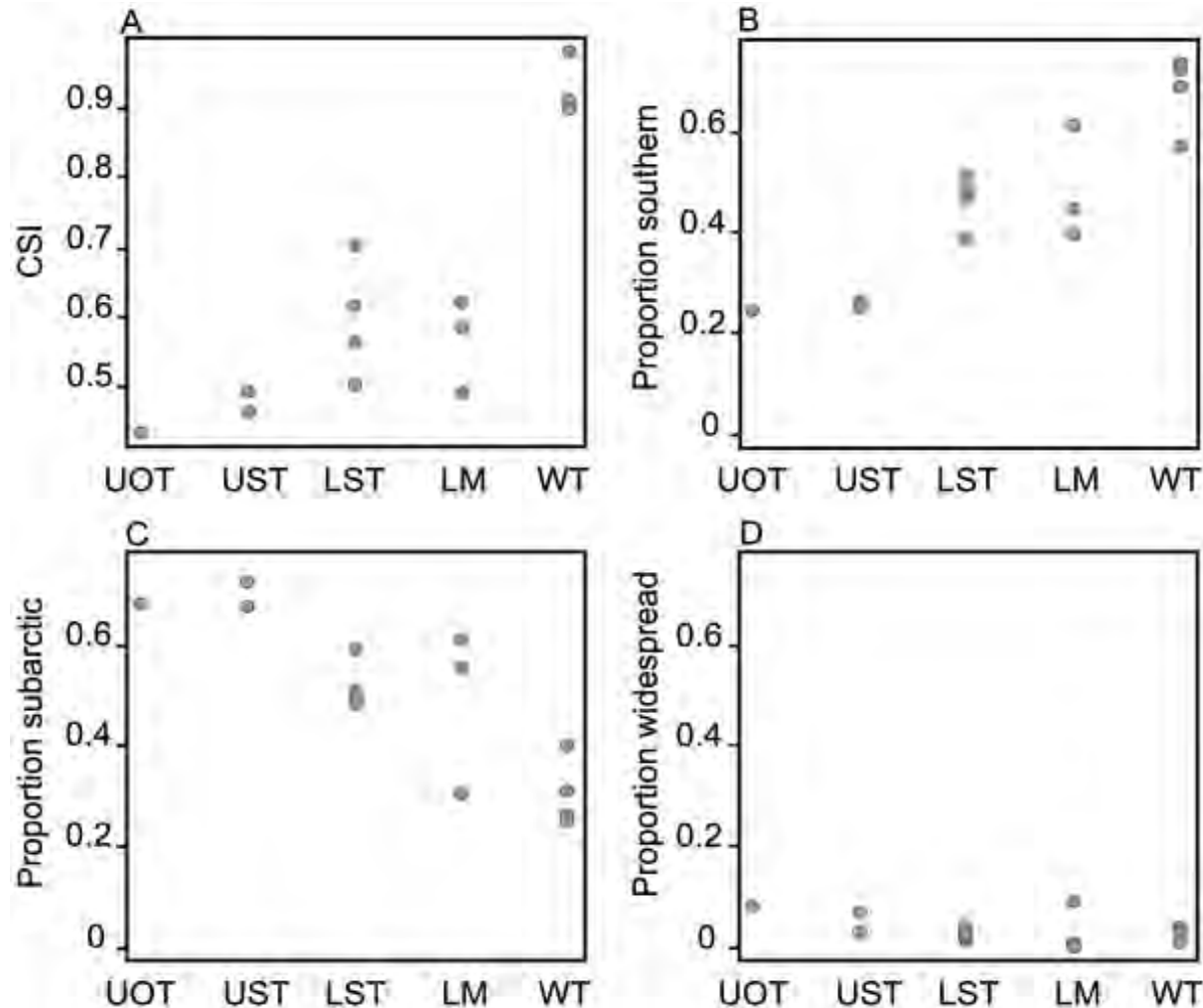


Yamal hare mean



- Medium-sized herbivore data

Erkuta results



UOT – Upland open tundra, UST – upland shrub tundra, LST – lowland shrub tundra, LM – lowland marshes, WT – willow thickets. A) Community specialization index, B) proportion of birds belonging to species with a southern distribution, C) proportion of birds belonging to species with a subarctic distribution and D) proportion of birds belonging to widespread species.

Sokolov et al., PlosOne, 2012

Erkuta results

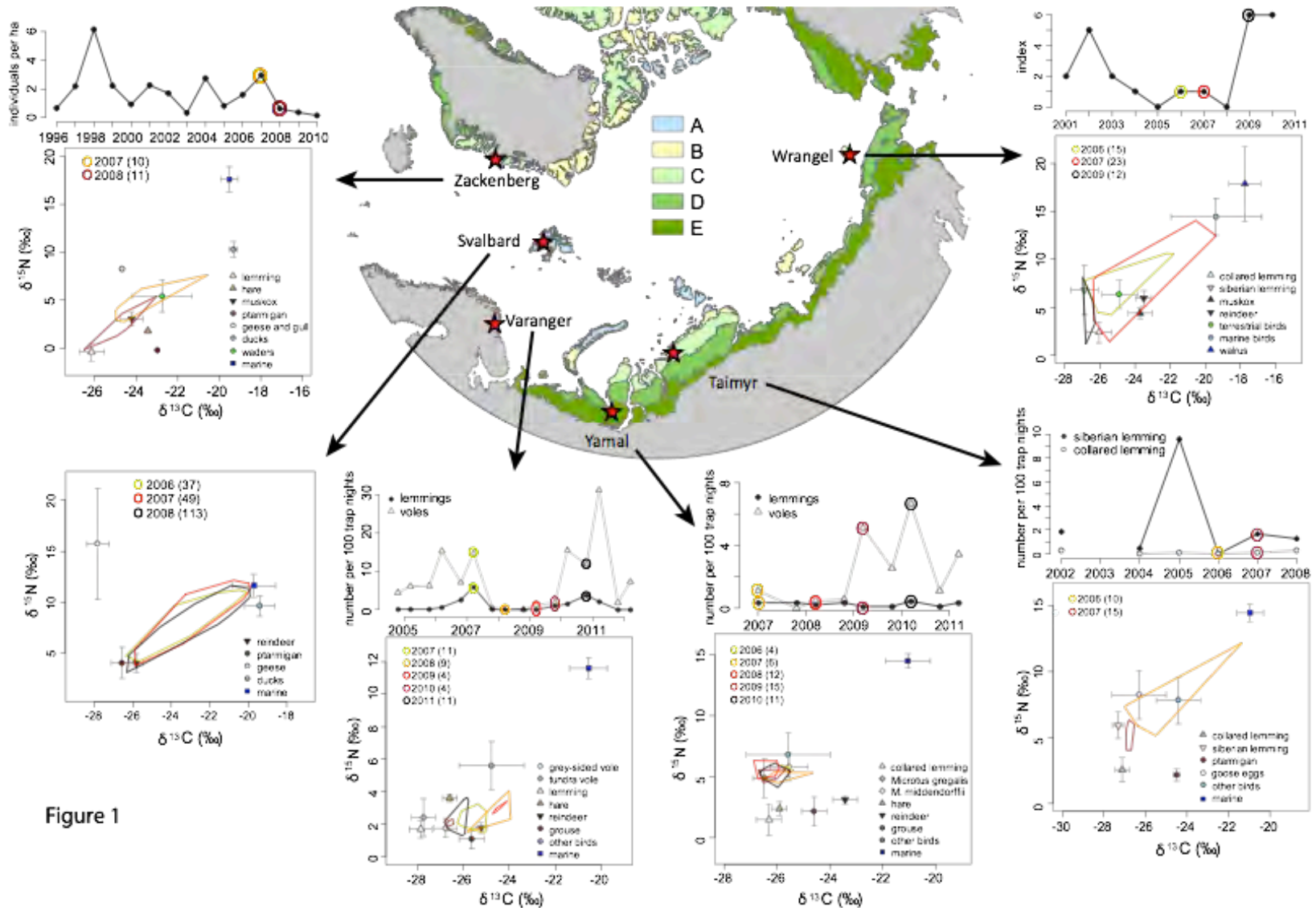
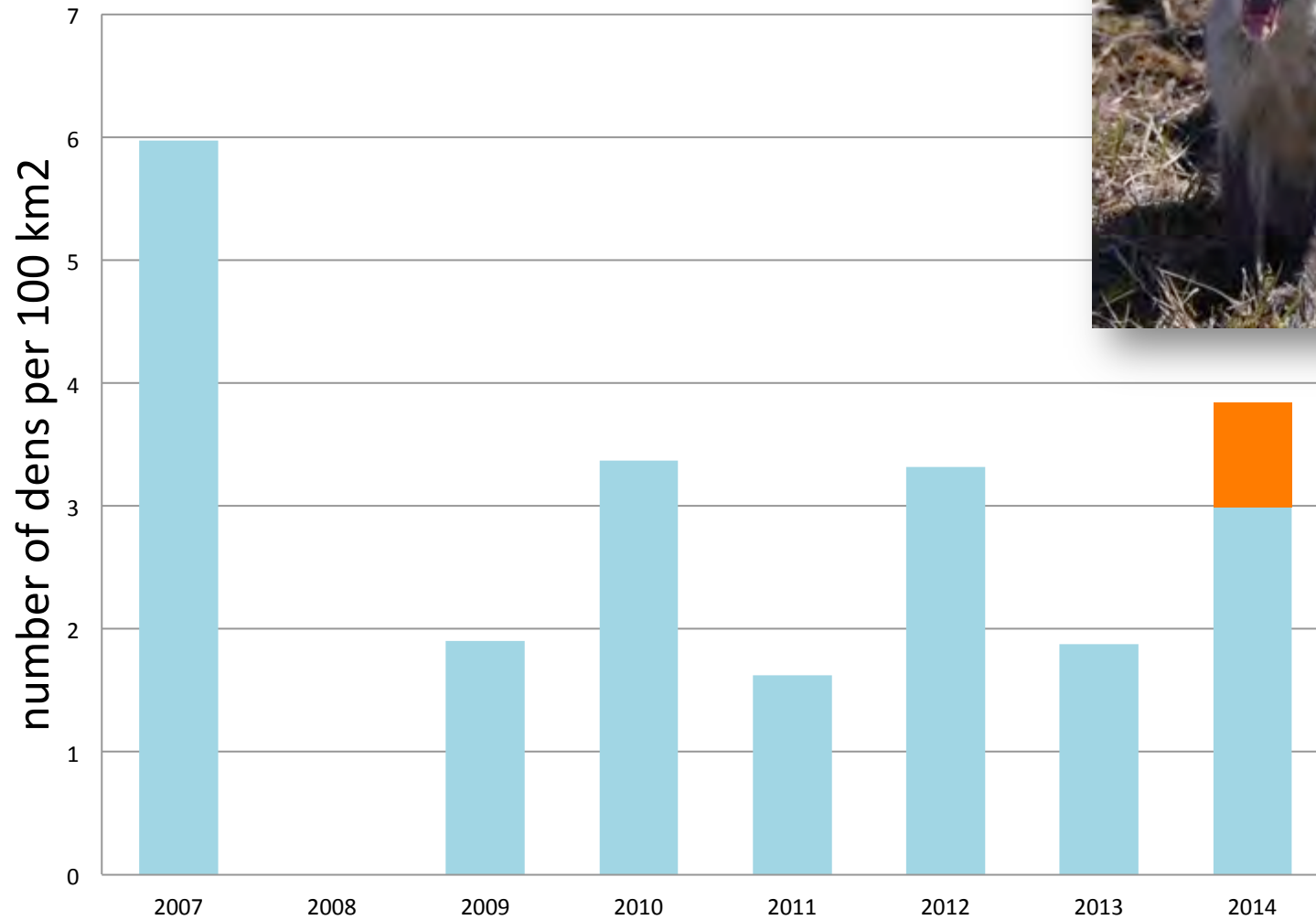
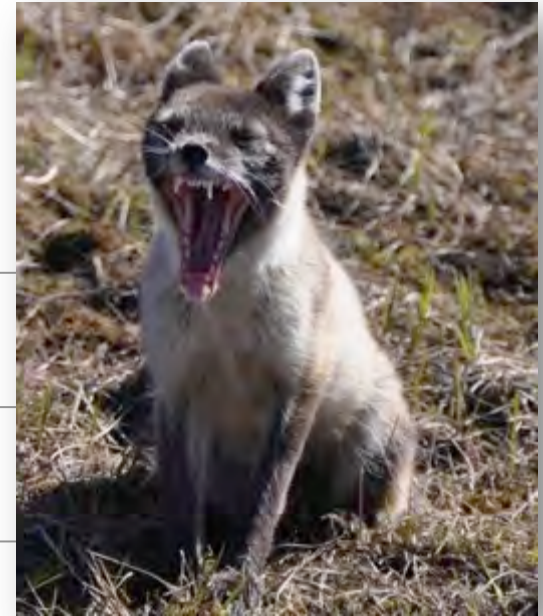


Figure 1

Erkuta results





Most northern red fox den in Yamal, Erkuta, 2014 (68,08N)



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Четыре района ввели ЧС из-за падежа оленей

22 Февраля 2014



САМОЕ ЧИТАЕМОЕ

[На Ямале от гриппа привили больше, чем планировалось](#)
Практически треть ямальцев будет привита от гриппа, заявила на пресс-конференции для журналистов руководитель Управления Роспотребнадзора РФ по ЯНАО Людмила Нечепуренко.

[Фотофакт: забытый в центре Салехарда сугроб](#)

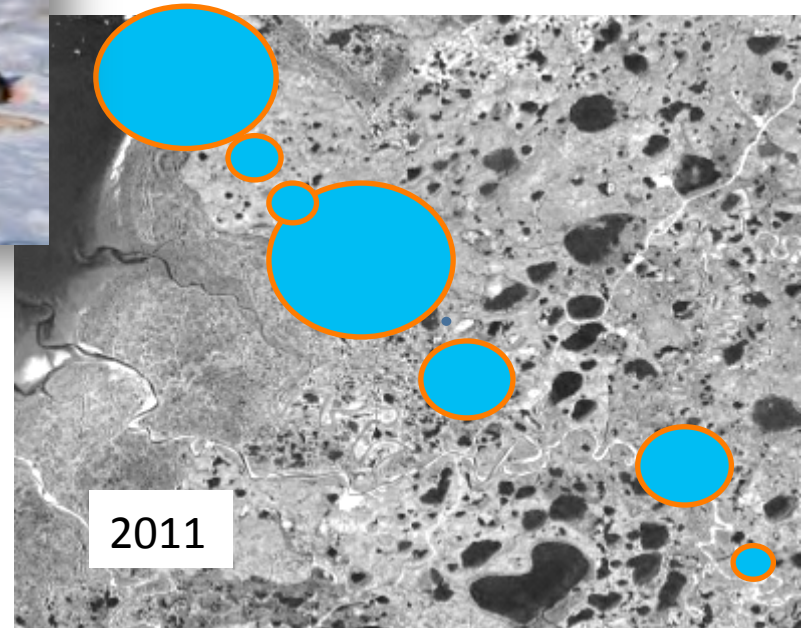
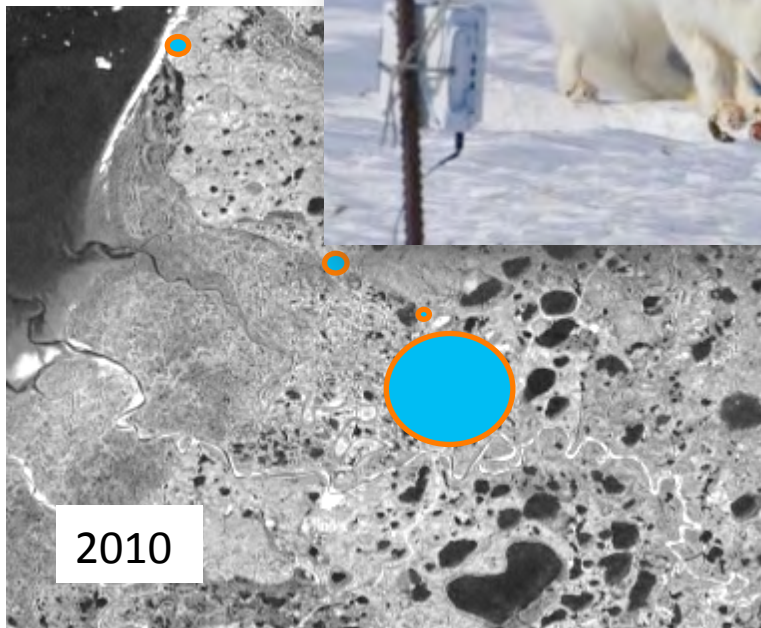
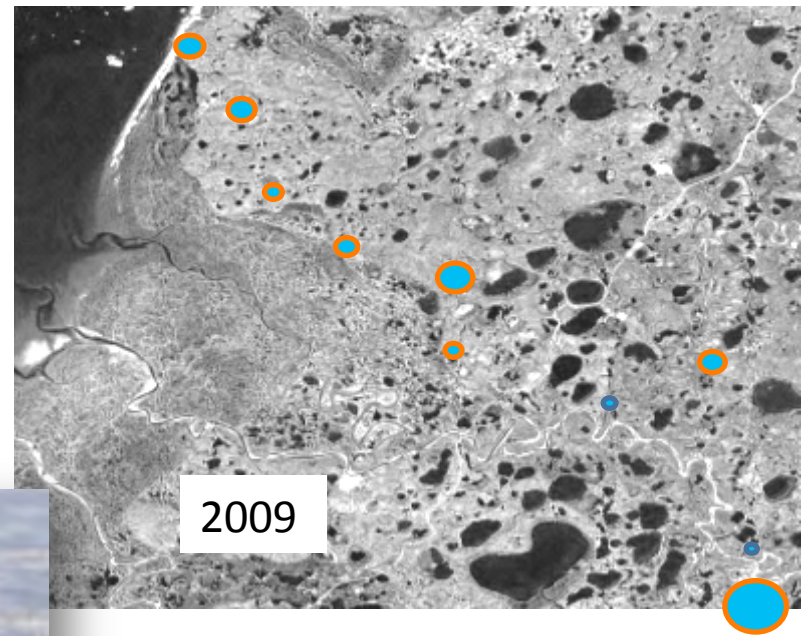
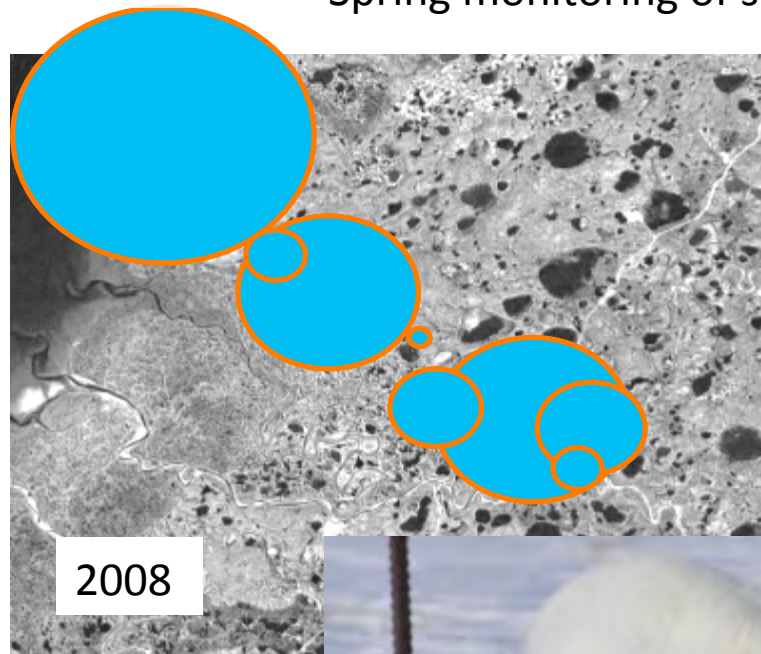
Надо отдать должное дорожным службам окружного центра – первый снег не застал их врасплох, десятки единиц техники активно расчищали улицы и тротуары города.

[Ямальцы назвали пять негативных факторов](#)

В то, что в дальнейшем жизнь будет только лучше считают 60% респондентов, 26% высказали

Official statistic – ca. 100 000 reindeers die after rain-on-snow event

Spring monitoring of scavengers with automatic cameras



Plans

- Try to be more ecosystem-based and question driven:
- Start of herbivore exclosures experiment (2014)
- Develop latitudinal gradient of monitoring sites (Erkuta analog)
- Extend the use of tracking techniques for mammals and birds (arctic fox, rough-legged buzzard, long-tailed skua)

Initiatives of Yamal Government

- “Science Center for Arctic Studies” (2012)
- “Yamal Arctic” expeditions – (2012, 2013)
- Belyi Island field station
- However there is no long-term funding yet



What opportunities exist to better coordinate Arctic Terrestrial Biodiversity Monitoring?

- Wider discussion and use of robust standard protocols of data collection and analyzing (but possible for harmonize data)
- Stimulating more international projects (CIRCUMpolar)
- Wider use of initiative such as INTERACT (Russian and NA stations out project funding)

How do we better integrate across disciplines, biotic groups and ways of knowing?

- Long-term monitoring sites should be able to host scientists from different disciplines and stimulate collaboration.
- Focusing on food-webs could be a means to better integrate across different biotic groups
- Underline importance for researchers to communicate with indigenous people in the tundra

Lessons learned related to terrestrial biodiversity monitoring

- use detailed field protocols which are widely discussed internationally before field work
- use food-web approach (ecosystem based) instead of species-specific studies
- Important variability of tundra ecosystems structure in different arctic regions which needs to be taken into account in biodiversity monitoring plans

How can we best assess cumulative effects?

Yamal could be a good place for study a cumulative effects, as it has all 3 major drivers of change:

- Climate change
- Reindeer herding
- Industrial development

Thank you!

