

## Project information

### Keywords

COAT

### Project title

COAT – Climate-ecological Observatory for Arctic Tundra

### Year

2015

### Project leader

Rolf A. Ims

### Participants

UiT, NINA, NP, UNIS, Met.no

### Flagship

Terrestrial

### Funding Source

Strategic Funding within the Terrestrial flagship

### Summary of Results

1. A paper on the utility of a new camera trap that allows for automatic monitoring of sub-nivean predator-prey interactions (e.g. lemming and mustelids) and temperature over the entire winter in remote tundra sites was published (Soininen et al. 2015). Data from a network of such camera traps established along altitudinal gradients on Varanger Peninsula in the fall 2014 were obtained in June and August 2015.
2. New census techniques of rock and willow ptarmigan has been tested on Varanger Peninsula in April-May 2015. This methodological study will form the basis for two master theses.
3. One master student (Eivind Flittie Kleiven) has graduated on a thesis that further develops hierarchical state-space models for predicting lemming outbreak amplitude based on COAT monitoring data.
4. We have contributed to analyzing monitoring of arctic predators on the island Kolguyev in the Russian low arctic where rodent specialists such as rough-legged buzzards and arctic foxes maintain viable populations based on mainly goslings and ptarmigan (Pokrovsky et al. 2015).
5. Funding from RCN (30 mill NOK) and from Tromsø forskningsstiftelse had been obtained to develop COAT Infrastructure on Varanger Peninsula and Svalbard.

### For the Management

**Presently COAT has tasks within several of its monitoring modules that feed directly into management:**

- The COAT Varanger forest-tundra ecotone module investigates - in collaboration with the regional forest management authorities in Finnmark - the effect of salvage logging on the recovery of birch forest after devastating, climate change-induced forest insect outbreaks.
- The testing of methods for monitoring rock and willow ptarmigan was financially supported by Miljødirektoratet and is aimed at improving population estimates of important game species.
- The four COAT Svalbard modules provide knowledge about the population dynamics of four harvestable wildlife species (arctic fox, reindeer, rock ptarmigan and pink-footed geese) that can be used for setting harvesting quotas. COAT Svalbard members also presently assist the governor in Svalbard in developing a monitoring system for the zoonotic EM parasite that has the sibling vole as an intermediate host and the arctic fox as the determinate host.

1. Ehrich, D., Ims, R.A., Yoccoz, N.G., Lecomte, N., Killengreen, S., Fuglei, E., Rodnikova, A., Ebbinge, B., Menyushina, I., Nolet, B., Pokrovsky, I., Popov, I., Schmidt, N. M., Sokolov, A., Sokolova, N. & Sokolov, V. 2015. What can stable isotope analysis of top predator tissues contribute to monitoring of tundra ecosystems? *Ecosystems* 18: 404–416
2. Pokrovsky, I., Ehrich, D., Ims, R.A., Kondratyev, A.V., Kruckenberg, H., Kulikova, O., et al. 2015. Rough-Legged Buzzards, Arctic Foxes and Red Foxes in a Tundra Ecosystem without Rodents. *PLoS ONE* 10(2): doi:10.1371/journal.pone.0118740
3. Soininen, E., Jensvoll, I., Killengreen, S.T. & Ims, R.A. 2015. Under the snow: A new camera traps open the white box of subnivean ecology. *Remote Sensing in Ecology and Conservation* doi: 10.1002/rse2.2.
4. Ims, R.A. 2015. Lessons from a changing arctic. *BioScience* 65: 830-831.

Communicated Results

*Toward plans for coordinated Ecological Monitoring*". Ny Ålesund Workshop, 8. February 2015

*“How to monitor Arctic ecosystems in the age of climate change?”*

*A plan for Climate-ecological Observatory for Arctic Tundra*". Invited Lecture, Centre of Ecological and Evolutionary Synthesis, UiO, 23. February 2015.

*Écosystème arctique en changement. Lecture, Quebec City, February 28, 2015*

*«Varangerhalvøya i klimaendringenes tidsalder & Det langsiktige forskningsinitiativet – KOAT»*. Foredrag ved Åpning av Varangerhalvøya Nasjonalparksenter, 10. mars 2015

*“Changing Arctic Ecosystems under a Rapidly Warming Climate:*

*Implication for Grouse Research*". Plenary Lecture, International Grouse Symposium, Reykjavik, September 6 2015

The main interdisciplinary axis of COAT is Climatology and Ecology and these two disciplines are presently well integrated in the project. When COAT is fully developed also a social science component will be implemented.

Budget in accordance to results

The funding from the terrestrial flagship to COAT is instrumental for running the core monitoring series within COAT until full external financing has been obtained. The funding also serve as a necessary compliment to internal funding provided by UiT and NPI and external funding from the Norwegian Environment Agency.

Could results from the project be subject for any commercial utilization

No

Conclusions

- A. The financing provided by the terrestrial flagship in 2015 has allow us to developing COAT some further steps towards our ultimate ambition as stated in the COAT Science Plan: i.e. to become the world's most advanced and comprehensive ecosystem-based monitoring system for in the arctic.
- B. In 2015 we have published a novel technique for monitoring subnivean ecology (Soininen et al. 2014)