Project information

Keywords
Adaptive monitoring, food webs, climate impacts
Project title
Climate-ecological Observatory for Arctic Tundra
Year
2018
Project leader
Rolf A. Ims
Geographical localization of the research project in decimal degrees (max 5 per project, ex. 70,662°N and 23,707°E)
Svalbard; 74-81oN, 15-30oE, Varanger Peninsula; 70-71oE, 28-31oE
Participants

UiT, NP, NINA, MET, UNIS

Flagship
Terrestrial
Funding Source

Terrestrial flagship: 0.430 mill. NOK

UiT: 1,7 mill. NOK

MilDir: 2.0 mill. NOK

Summary of Results

COAT is a strategic activity within the terrestrial flagship that aims to develop and run an ecosystem-based adaptive monitoring system for arctic tundra in Svalbard and the Norwegian mainland.

The financial support from the Fram Centre has allowed us to maintain several monitoring series in Svalbard and the Varanger Peninsula as well as to develop new monitoring tools.

Beyond the standard maintenance of the monitoring series, the following other achievements have been made in 2018:

- We performed a new season with trials of acoustic sensors (sound stations) to monitor populations of ptarmigan on Varanger Peninsula and Svalbard. At the latter site the senor data can be calibrated against point transect data. The large amounts of raw data acquired require automated processing to identify species, and hopefully also unique ptarmigan individuals. The development of algorithms and software to achieve this is underway in the COAT Tools project and in collaborations with french scientists that has extensive experience with the methodology from the Alps. PhD-student Marita Strømeng – for which development of this methods will be a part of her thesis work - will travel to France in November in order to work with our French collaborators.

- A system of 48 new camera traps for small mammals were established in one COAT's intensive monitoring sites on Varanger Peninsula.

-A pilot study within COAT's ptarmigan module aimed to test whether motion sensitive cameras could aid the identification of nest predators was conducted on Varanger Peninsula.

- Within the Svalbard moss tundra module new monitoring sites were established during summer 2018. The sites function as "module stations" where automatic cameras and moisture loggers will be located, and are currently equipped with a set of iButtons for temperature. Status now is 33 sites distributed in Adventdalen, Sassendalen, Alkhornet and Brøggerhalvøya. Point frequency method is used for biomass, and many of the sites were also photographed with drones.

Master and PhD-students involved in the project

Three master students connected to COAT graduated in 2018:

Zina Kebir, MSc 2018, Varanger Arctic fox module

Ingrid Paulsen, MSc 2018, Svalbard Ungulate Module

Clemence Koren, MSc 2018, Varanger Tall shrub module

Published Results/Planned Publications

Irvine, R. J. 2018. Little impact of over-winter parasitism on a free-ranging ungulate in the high Arctic. *Functional Ecology*. 32: 1046–1056.

Pedersen, Å.Ø., Stien, J., Eidesen, P.B., Ims, R.A., Jepsen, J.U., Stien, A. and Fuglei, E. 2018. High goose abundance reduces nest predation risk in a simple rodent-free high-Arctic ecosystem. Polar Biol. 41: 619-627.

Kleiven, E.F., Henden, J.A., Yoccoz, N. G. & Ims, R. A. 2018. Seasonal difference in temporal transferability of an ecological model: near-term predictions of lemming outbreak abundances. Scientific Report, *8:15252*,

Soininen, E. M., Henden, J. A., Ravolainen, V. T., Yoccoz, N. G., Bråthen, K. A., Killengreen, S. T., & Ims, R. A. (2018). Transferability of biotic interactions: Temporal consistency of arctic plant–rodent relationships is poor. *Ecology and Evolution*. Online early: https://onlinelibrary.wiley.com/doi/abs/10.1002/ece3.4399

Metcalfe, D.B., Cherif, M., Jepsen, J.U., Vindstad, O.P.L., Kristensen, J.Å., & Belsing, U. (2018) Ecological stoichiometry and nutrient partitioning in two insect herbivores responsible for large-scale forest disturbance in the Fennoscandian subarctic, In Press Ecological Entomology.

Vindstad, O.P.L., Jepsen, J.U., Ek, M., Pepi, A. & Ims, R.A. Can novel pest outbreaks drive ecosystem transitions in northern-boreal birch forest? *J. Ecol.* (in press).

Milner, J. M., Stien, A. and van der Wal, R. 2018. Retrospective growth analysis of the dwarf shrub Cassiope tetragona allows local estimation of vascular plant productivity in high arctic Svalbard. *Journal of Vegetation Science* 29: 943-951. https://doi.org/10.1111/jvs.12679

Holmgaard, S.B, Eythórsson, E. & Tombre, I.M. 2018. Hunter opinions on the management of migratory geese: a case of stakeholder involvement in adaptive harvest management, Human Dimensions of Wildlife, 23:3, 284-292, DOI: 10.1080/10871209.2018.1424269

Tryland, M., Balboni, A., Killengreen, S.T., Mørk, T., Nielsen, O., Yoccoz, N.G. , Ims, R.A. & Fuglei, E. 2018. A screening for canine distemper virus, canine adenovirus and carnivore protoparvoviruses in Arctic foxes (*Vulpes lagopus*) and red foxes (*Vulpes vulpes*) from Arctic and sub-Arctic regions of Norway, Polar Research, 37:1, DOI: 10.1080/17518369.2018.1498678

Communicated Results

Chronicles

- "COAT gir minimalt foravtrykk ", Finnmarken 21 December.
- "Hva skjer med rypene?", Morgenbladet 22. February
- "Bør nord-norsk natur rødlistes?", Nordlys og Vesterålens Blad, april

Oral Presentations:

- COAT was presented on the side event "Call 88 – 18 – 48" during the Arctic Frontiers venue, 24 January.
- "Økosystemet på Svalbardtundraen: Overvåking og forskning». Nordiska Genbank, UNIS, 24.01.18
- Klimaøkologisk observasjonssystem for arktisk tundra - COAT: Hva er det? Svalbardseminaret, UNIS, 16.01.18
- «Arctic biology into the future: Climate change» - Opening of UiT's new Biology building 12.1.18.
- "Northern game species and climate change"; "Norges Jeger og Fiskerforbunds, Avd. Troms Annual meeting, March 3.
- "Tundra i endring – vinner eller taper svalbardreinen?" Svalbard Museum, 30. mai
- Moth outbreak monitoring, past and present", Kevo Research station 60 year anniversary workshop, sept.
- Climate-Ecological Observatory for Arctic Tundra - Implementation of COAT: Status 2018, Ny Ålesund Terrestrial flagship meeting, Sept.
- Dette har du i vente – et langtidsvarsel», Conference «Natur i endring», Alta 23.-24.10. Oktober
- Lauvmakk – skogdødaren», Conference «Natur i endring», Alta 23.-24.10. Oktober
- Rangifer management controls a climate-sensitive tundra state transition, Arctic Biodiversity Congress 9.-12. Okt.
- Rangifer management controls a climate-sensitive tundra state transition, Arctic Biodiversity Congress 9.-12. Okt.
- Ecosystem drivers and adaptive management of the critically endangered arctic fox in northeastern Norway, Arctic Biodiversity Congress 9.-12. Okt.
- Climate-Ecological Observatory for Arctic Tundra (COAT), Arctic Biodiversity Congress 9.-12. Okt.
- Research needs on terrestrial ecosystems and their living resources; impact of climate change, Arctic Biodiversity Congress 9.-12. Okt.

Posters:

- Jane Jepsen: Drivers of ecosystem state changes in sub-arctic birch forest: moth outbreaks and ungulate management, Oikos 2018 conference ,Trondheim
- Ingrid Paulsen: Calving site characteristics and site fidelity of calving ranges in Svalbard reindeer, Oikos 2018 conference ,Trondheim
- Zina Kerbir: Response of corvids to small rodent dynamics in tundra ecosystems, Oikos 2018 conference ,Trondheim
- Eeva Soininen: Climate-Ecological Observatory for Arctic Tundra (COAT), Oikos 2018 conference ,Trondheim

Interdisciplinary Cooperation

COAT is an interdisciplinary project that involves ecology and geophysics/climatology

Budget in accordance to results

The funding from the Fram Centre was used according to plans; i.e. to run the long-term observation series in Varanger and Svalbard and to test new census methods.

Could results from the project be subject for any commercial utilization

No

Conclusions

The aims of the project was fulfilled and the funding obtained from the Fram Centre's terrestrial flagship has contributed significantly to the development/maintenance of the COAT program.