

Project information

Keywords

Phenology match-mismatch pollination flowering Svalbard High Arctic temperature snow melt

Project title

SnoEcoPhen: Phenological synchrony of arctic plants and their pollinators at altered snow regimes.

Year

2015

Project leader

Elisabeth J. Cooper

Participants

Mark Gillespie, Nigel Yoccoz, Lennart Nilsen, Steve Coulson, Saskia Bergmann

Flagship

Terrestrial

Funding Source

## **Tema 2: Effekter av endringer i årstider og frekvens av ekstremhendelser**

Summary of Results

Over 600 insect pollinator specimens were collected while visiting 20 different flower species in Adventdalen, Svalbard, between June 17 and August 21 2015. The insects are mainly members of the orders Diptera and Hymenoptera, and will be identified to species where possible over the next 12 months. The insects were caught during standardized 10-minute observation periods of individual flowers of each species present in a predefined area (500 x 500m) on calm and sunny days, between the hours of 1000 and 1600. Two individuals of each flower species were observed on each day. The insect data will be used to construct a plant-pollinator network for mesic meadow habitat on Svalbard.

For the Management

This project aimed to address the lack of information on the likelihood of phenological mismatches between trophic levels in the event of climate change, and on the likely consequences of any changes. To achieve this, the plant-pollinator food-web network of a Svalbard mesic meadow habitat was examined and the combined impact of delayed snow melt and elevated temperature on that network was tested. Throughout summer 2015 insects observed visiting all flower species in a predefined area were collected and the phenology of insect pollinated plants and their insect pollinators (flies, moths and wasps) were studied within plots manipulated to simulate delayed snow melt and elevated spring temperatures. The results will be analysed to identify how these species react to these simulated changes and whether their relationships are likely to become disrupted, and to assess the likely consequences of this disruption

to ecological functions such as pollination.

#### Published Results/Planned Publications

A publication will present: 1 the first plant-pollinator network for Svalbard and compare metrics of resilience and structure to other Arctic regions; and 2 the synchrony of between flower and pollinator phenology as a result of manipulated snow melt timing.

#### Communicated Results

none so far

#### Interdisciplinary Cooperation

A collaboration between scientists specialised on invertebrate lifecycles, population and ecology, plant ecologists and biogeochemists, on the trophic-level interaction dynamics of changes in snow melt timing.

#### Budget in accordance to results

We have carried out what we intended to do with the funding. However, we will need to seek further funding for continuation of the invertebrate identification and analyses.

#### Could results from the project be subject for any commercial utilization

No

#### Conclusions

This project investigates the likelihood of phenological mismatches between trophic levels in the event of climate change and the likely consequences of any changes. Fieldwork has been carried out as planned, and analysis is ongoing.