Project acronym: RESTEP

Project title: Retracing the steps of historic researchers to assess responses of Arctic bumblebees to climate change

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Discipline: Earth Sciences & Environment: Ecosystems & Biodiversity

Station(s): Abisko Scientific Research Station (Sweden)

Arctic communities are warming at an unprecedented rate under climate change. How Arctic communities will respond to such rapid warming is therefore an important question, with evidence already of some “southern-latitude” species invading northern regions and changes to the timing of seasonal events (phenology). Both of these climate impacts are expected to disrupt the mutualistic interactions that underpin Arctic communities, such as those between plants and pollinators, and potentially cause declines in Arctic specialists – but our understanding of whether this is actually happening is thus far limited. Part of the challenge is that we lack of baseline historic data to track how Arctic ecosystems are changing. Therefore, we request funds to travel to Abisko Scientific Research Station to retrace the steps of two pioneering researchers (Esa Ranta & Hans Lundberg), who collected high-resolution data on the pollinator (bumblebee) and plant communities in 1972 on Mount Nuolja in Abisko. By sampling repeatedly over a 3-month period in 13 permanent plots along an elevational gradient, we will follow their standardised protocol to collect contemporary data on bumblebee altitudinal distributions, habitat use, phenology and foraging preferences. By comparing the contemporary and historic datasets, we will investigate whether any shifts in phenology or habitat use have occurred and if they are more pronounced in Arctic- or non-Arctic species. We then aim to understand whether such shifts have impacted plant-bumblebee interactions, and whether changes in bumblebee foraging behaviour or levels of competition since 1972 are associated with changes in population trends.