Project acronym: ArcticBuzz

Project title: Understanding the dynamics of plant-pollinator responses to climate change
Project leader: Richard Gill, Imperial College London, UK

Discipline: Life Sciences & Biotech: Other - Life Sciences & Biotech

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

Climate change is a pressing global issue, yet gaps remain in our understanding of how robust animal and plant communities are to such change. For plant-pollinator networks understanding the susceptibility of mutualistic partners to climate change requires historic data integrated with knowledge on population status and community network structure. To study this requires: i) high resolution temporal data spanning appropriate time scales; ii) spatial data to compare responses to climatic variation within and between years; iii) data on population dynamics for multiple species constituting the community; iv) understanding the interspecific interactions between pollinators; v) knowledge of how pollinator community alterations are reflected in host plant community change. This application asks for funds to support travel to Abisko research station for Gill and two Masters students in the Gill group to conduct fieldwork along a 100-year phenology transect (est. T. Fries 1917). With past bumblebee (1960s-80s) and plant data (1910s-2010s) collected along this transect, this project will use the 850m altitudinal gradient as a thermal cline to examine community responses across vegetation zones representative of higher latitudinal habitats. This will allow comparative analyses of pre-climate change and present-day data collections, involving measures of within (and between) seasonal changes to community composition of bumblebees and investigate floral resource acquisition across space. The fieldwork will help to study: i) signs of phenological mismatching (asynchrony in life-history trait(s)), ii) interactive decoupling and host shifting to investigate levels of network resilience to short and long-term changes in climatic conditions, and iii) indirect interactive effects through intra and inter-specific competition. Fieldwork will undertaken in Abisko national park (necessary permits have bene obtained by Keith Larson). It will include 4-5 days of each week over approximately 10 weeks observing the bumblebee community and the host plants they visit. Bees will be marked and a non-lethal tarsal clip will be taken for future molecular studies on population estimates.