



Project acronym: BITCue

Project title: Biotic interactions tracked by computer vision

Project leader: Toke Høye, Aarhus University, Denmark

Discipline: Earth Sciences & Environment: Other - Earth Sciences

Station(s): Rif Field Station (Iceland), Toolik Field Station (USA)

BITCue aims to test if interactions among plants and pollinators are sensitive to local and large-scale climatic variation, and to quantify the consequences for plant reproduction. We pursue this aim by using cutting-edge technology and climate change experiments. We will quantify flower visitation rates at a uniquely high temporal resolution across the growing season using a large number of time-lapse cameras, computer vision and machine learning. We will focus on a widespread, insect pollinated plant species and its flower visitors across ten tundra sites (five included in this proposal and five supported by existing funding) covering contrasting climate conditions. The detailed quantification of biotic interactions in BITCue will be used to identify the most important climatic factors for flower visitation rates and pollination. BITCue will pioneer phenological studies at the level of individual flowers and we expect the project to pave the way for using camera traps on invertebrate species such as insects and for tracking biotic interactions.

During the 2019 field season INTERACT support to this project allowed us to install camera traps at multiple sites, all of which were successful. This year, we will add one important site (Zackenbergl), where related data has been manually collected for 25 years. Access to this site will be an important step towards automation of some of the long-term monitoring currently taking place at the site. It will also establish a link between the long-term data already collected at Zackenbergl and the spatially replicated data collected in BITCue. We wish to revisit Toolik Lake Station and the NERC station at Ny Alesund to establish solar panels and battery solutions for more viable and cost-effective long-term power solutions to the camera systems and finally, we would like to expand the number of camera traps at the RIF station, where we had rather limited funding for equipment during the 2019 season.