



Project acronym: CRYPTOSOIL

Project title: Cryptogams as the main factor influencing initial development of soil and carbon sequestration in glacier forelands in northwest Sweden

Project leader: Paulina Wietrzyk, Jagiellonian University, Cracow, Poland

Discipline: Earth Sciences & Environment: Ecosystems & Biodiversity

Station(s): Tarfala Research Station (Sweden)

The main aim of the project is to determine: 1) influence of cryptogams on initial soil development and carbon sequestration in deglaciated areas of three glacier forelands in Sweden; 2) rate of cryptogam primary succession and soil development in studied glacier forelands; 3) interrelationship between soil properties and cryptogamic species succession. Soil development and cryptogam succession are inseparably linked and influence each other. On-going climate changes, causing a progressive recession of glaciers, provide excellent conditions for studies aiming to explain the nature of above-mentioned processes. Plant communities developing in forelands consist mainly of cryptogam species, creating on the soil surface so-called biological soil crusts (BSCs). However, the majority of previous studies overlooked importance of cryptogam. The project focuses on the role of cryptogams in soil development and carbon sequestration processes in glacier forelands in Sweden. Studies concerning these aspects are, as yet, limited. Fieldwork will be conducted in the three glacier forelands located near Tarfala Research Station: Isfallsglaciären, Storglaciären, and Rabotsglaciären. In each forelands three parallel linear transect will be designated: from the glacier forehead till the end of foreland. Along transects, in ca. 50 m, a sampling site will be established. In sampling sites, the data on cryptogam presence, species percentage cover, and total percentage cover of BSCs will be obtained using 1m² frame. Additionally, sample of soil and BSCs will be collected. With the use of drone DJI Phantom 4 Advanced, aerial data on digital terrain model and landcover of forelands and characteristic parameters of sampling sites will be obtained.