Project acronym: blueDENDRO

Project title: Blue rings used for reconstructing summer cooling events in northern Fennoscandia

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Discipline: Earth Sciences & Environment: Global change & Climate observation

Station(s): NIBIO Svanhovd Research Station (Norway)

Growth rings of trees and shrubs are unique proxy of past climate conditions. These natural archives of annual resolution allow to reconstruct past environmental conditions, including disturbances. In this project we aim to explore how the northernmost and long-living woody plants, sub-arctic shrubs, record summer cooling events after large volcanic eruptions. We aim to study Juniperus spp. shrubs growth rings chronology and wood anatomy from northern Fennoscandia. Specifically, we will focus on 'blue rings', i.e. growth rings that contain not fully lignified cell walls, formed during severe cooling events that might be related to large volcanic eruptions. For this purpose we will collect shrubs and trees (for comparison purpose) in the area close to NIBIO Svanhovd research station (NE Norway). To perform the project we will use dendrochronological methods and quantitative wood anatomy. We will establish growth rings chronologies and perform climate-growth relationship analyses of juniper shrubs and Scots pine trees. We will attempt to relate calendar years of blue rings formation in Juniperus spp. shrubs with calendar dates of past large volcanic eruptions, such as Tambora (1815) or Krakatoa (1883). Wood anatomical analyses on blue rings from shrubs were never conducted. Thus, our project has a great potential to fill this research gap and to deliver first wood anatomical proxies of past volcanic eruptions from the sub-arctic shrubs.