



Project acronym: DISTUNDRA

Project title: Disturbances and their consequences for vegetation of arctic tundra ecosystem, comparison to the experience from alpine tundra

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Discipline: Earth Sciences & Environment: Ecosystems & Biodiversity

Station(s): Arctic Station (Greenland/Denmark)

Proposed project focuses on increasing human pressure (disturbances, non-native species) on arctic vegetation of Greenland coupled with effect of global change, such as warming and atmospheric nitrogen deposition. Comparison with alpine tundra will allow to generalize and disentangle described processes. Effects of increasing tourism on the fragile arctic vegetation coupled with global changes are to be studied at Disco Bay, Greenland (Arctic Station) using combination of remote sensing and field survey. In collaboration with the team of prof. B. U. Hansen from Copenhagen University, consequence of human activities such as tourism causing disturbances (trampling, soil erosion, nutrient enrichment, and introduction of non/native species) are to be assessed using a series of middle and high resolution satellite imagery and very high resolution unmanned aircraft (UAS) imagery acquired by the Danish team. The main parameters assessed from remote sensing data will be vegetation cover/amount of bare soil, plant photosynthetic activity and biomass expressed by known indices such as NDVI and NDSI, and length of the vegetation season (date of snow melt) around settlements and transportation corridors compared to the undisturbed tundra. On UAS imagery, we will analyze structure and composition of vegetation to assess human impact. The distant approach will be supplemented by field survey along human settlements and trails focusing on changes in plant species composition (both native and non-native species) and vegetation cover (reduced by trampling). The field survey will be divided in (a) extensive survey for non-native plant species in the area, (b) collecting ground-truth data for interpretation of remotely sensed imagery and validation of the results, and (c) detailed survey designed in five transects perpendicular to trails/roads to cover both untouched and altered tundra vegetation.