



Project acronym: EXPLORE

Project title: Exploring the permafrost microbiome in Northern Greenland

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Discipline: Earth Sciences & Environment: Ecosystems & Biodiversity

Station(s): Villum Research Station (VRS) (Greenland/Denmark)

We established in 2018 a field experiment at Villum Research Station (Greenland). To my knowledge there is the northernmost soil transfer experiment to investigate terrestrial microbial communities. The experiment includes: an in-situ cross-factor experiment to evaluate the impact of warming (increase of temperatures and soil nutrients) on the structure and metabolic functions of the local permafrost and active layer microbiota. The experiment consists of three treatments: increase of soil temperatures, substrate amendment and both increase of soil temperatures and substrate amendment. Controls were included for each of the treatments. In 2019 during a second field campaign we sampled transplanted soils after one year and analysed soil microbial communities using bacterial 16S and fungal ITS amplicon sequencing and respiration was used as a measure of microbial activity. Therefore, we plan to take soil samples and read out logger data on soil temperatures again after three (2021) or four years (2022) at Villum Research Station. Similar transplant experiments were established in 2018 in the Arctic (Abisko region, North of Sweden) and in 2016 in the Swiss Alps (Muot da Barba Peider) which we also plan to sample in 2021 and 2022 for comparison with the High Arctic Villum transplant experiment.