



Project acronym: OMI-PERM

Project title: Organo-Mineral Interactions from permafrost disturbance to sediment sink

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Discipline: Earth Sciences & Environment: Other - Earth Sciences

Station(s): Zackenberg Research Station (Greenland/Denmark)

Amplified climate change in the Arctic may trigger complex feedback mechanisms to global climate. Permafrost soils store large amounts of organic matter (OM), which upon thaw are exposed to decomposition, thereby generating greenhouse gases that fuel further global warming. Permafrost thaw is also expected to increase the hydraulic conductivity of the landscape, allowing for the enhanced release of OM to the aquatic environment. Here it can either be decomposed further or buried and removed from active carbon cycling. Close association between OM and mineral matrices are thought to protect permafrost OM from decomposition, yet, how this complex interplay of different mechanisms evolves during transit is still insufficiently understood. The aim of our proposed research is to investigate the role of organo-mineral associations during lateral transport in the Zackenberg valley, Northeastern Greenland. This will be achieved by collecting soil samples from the active layer and permafrost at places of abrupt thaw (i.e. thermokarst features), water samples and stream sediments along the release path, as well as water and sediment samples close to where the material is discharged into Young Sound. For all these samples we will characterize the OM and mineral composition both quantitatively and qualitatively. With this project we aim to breach over disciplinary boundaries in two ways: By following material released from permafrost soils along the flow path to its sedimentary sink, we bring together soil and marine scientists and at the same time integrate studies on OM and the mineral matrix.