



Potential environmental impacts of natural and mining related dust in Greenland and Svalbard

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Dispersion and deposition of mineral dust from natural or anthropogenic sources such as proglacial rivers, mines and haul roads can have both positive and negative effects on the environment, depending on the geochemical and mineralogical composition of the dust. Some elements in dust may act as nutrients for, for example, plants, lichens and soil communities, while other elements may act as pollutants with negative impacts on growth or reproduction or cause diseases in animals and plants.

To support the sustainable development of environmentally safe mining in sensitive Arctic land areas and reduce airborne environmental pollution, an improved understanding of processes leading to the dispersion of mineral dust in a changing Arctic is needed. This involves improved methods for monitoring dust emissions and dust deposition in a cold environment as well as analytical tools and methods to source trace and differentiate between natural and mining related dust. Accurate identification of individual dust sources subsequently makes it possible to mitigate emissions and target the regulation of mining activities towards these sources.

In this study, we present preliminary results from two new arctic dust monitoring stations in West Greenland and Svalbard. In Kangerlussuaq, West Greenland, mineral dust has been collected using a wide array of passive and active dust samplers, including a continuously operated high volume dust sampler at a weekly sampling frequency over 2022/2023. In Svalbard, mineral dust has been collected in Adventdalen using passive dust collectors in a transect along the haul road to the active coal mines. Samples have been collected on a weekly sampling frequency in the period September to November 2023 to investigate the temporal and spatial variations in dust deposition rates, as well as the impact of haul road traffic relative to the natural dust emissions and depositions.