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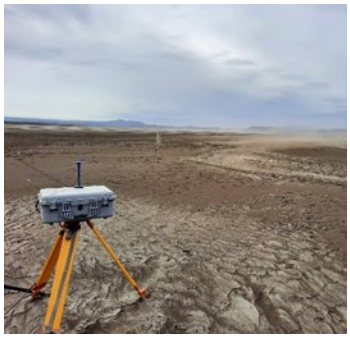

Two billion tons of dust are annually transported in our atmosphere all around the world. High latitudes include active desert regions with at least 5 % production of the global atmospheric dust. Active High Latitude Dust (HLD) sources cover > 1,500,000 km2 and are located in both the Northern (Iceland, Alaska, Canada, Greenland, Svalbard, North Eurasia, and Scandinavia) and Southern (Antarctica, Patagonia, New Zealand) Hemispheres. Arctic dust has been observed for many decades and it is estimated to contribute at least 3 % of the global dust budget. Almost one third of total dust load in the Arctic is from the HLD sources as the rest of the dust is transported from the Asian and African deserts.

Iceland is the largest Arctic as well as European desert with high dust frequency (~135 dust days annually and year-round). Icelandic volcanic dust travels distances > 3,500 km towards the Arctic and Europe, and settles on snow, ice and sea ice. It is estimated that about 7% of Icelandic dust can reach the high Arctic (N>80°). Airborne dust from Iceland has impacts on atmosphere, cryosphere, marine and terrestrial environments, as well as socio-economic sectors. It impairs air quality to levels ten-hundred times above safe health limits, disturbs the road safety, causes massive erosion and ecosystem destruction, but also naturally fertilizes oceans and soils. It also decreases albedo (radiation reflection) of ice/snow as well as mixed phase clouds. HLD was therefore recognized as an important climate driver in Polar Regions in the IPCC Report (2019).