Project acronym: BC-HOR

Project title: Spatial Distributions of Black Carbon and Mineral Dust in Air and Snow Surface Layers upon Hornsund Glaciers

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Discipline: Earth Sciences & Environment: Global change & Climate observation

Station(s): Polish Polar Station, Hornsund (Svalbard/Poland)

The scientific goals of the project was to evaluate the distribution of black carbon (BC) and mineral dust (MD) in the first layers of atmosphere and surface snow over targeted Svalbard glaciers in order to identify the mechanisms of the air/snow exchanges and to evaluate the spatial variability of the deposited dust and BC over the glacier surface. The project aimed also at characterizing the microbial community present in the snow surface layers, the relationships with the snow chemistry and the variability across different sites in the Svalbard islands. Similar measurements have been already performed in Ny-Alesund in spring 2016 and 2018. The results indicated that the aerosol deposition on surface snow is not uniform, and BC is more abundant in the lower parts of the glacier. BC in the air showed a not uniform profile with maximum at the lower altitudes. This project proposed to extend the measurements to Hornsund (HOR). Hornsund is very different from NYA for the effect of the sea, for the level of BC from local sources and for the different long-range transport. In both sites there exist glaciers with similar characteristics of dimension and elevation gradients (Kongsvegen (NYA) and Hansbreen (HOR)). Activities in HOR include snow samplings for BC and MD determination in the seasonal snow of the Hansbreen. BC in the air will be characterized with portable instrumentation deployed on a snowmobile and moving from the ablation towards the accumulation zones.