Technological innovations in Earth observation and remote sensing to provide geo-information in Svalbard

The Norwegian archipelago Svalbard is the utmost data-rich area in the Arctic in terms of availability of in situ measurements. Nevertheless, these datasets are spatially irregularly distributed and there are still enormous data gaps. To address these gaps and improve the network of Earth System Science observations, 26 institutions from 11 countries have joined forces in a multidisciplinary teamwork, the Svalbard Integrated Arctic Earth Observing System (SIOS) Our presentation primarily focuses on recent Earth Observation and remote sensing activities of SIOS and member institutions. We will highlight efforts from SIOS members in the operationalisation of remote sensing products. This presentation will cover a few selected technologically innovative applications in Svalbard e.g. (1) understanding permafrost movement using microwave and unmanned aerial vehicle data, (2) estimation of glacier velocity over Svalbard using interferometric synthetic aperture radar.Both of these applications are of wider interest for the remote sensing community in Svalbard to address broad Earth system science questions and SIOS remote sensing services emphasise the mutual benefits to field scientists and satellite owners. Therefore, SIOS is planning to make these remote sensing products available for the wider research community by collaborating with members from different nations. The limited funding available to individual institutions to conduct dedicated cal/val studies in Svalbard highlights the need for an international collaboration like SIOS, which optimises the use of existing infrastructure and data.