

IAF EARTH OBSERVATION SYMPOSIUM (B1)
Interactive Presentations - IAF EARTH OBSERVATION SYMPOSIUM (IP)

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EARTH OBSERVATION AND REMOTE SENSING FOR POLAR RESEARCH IN TIMES OF
PANDEMIC

Abstract

Over five million reported deaths and approaching around five percent of the world's population infected by February 2022, Covid-19 pandemic has shaken the world since March 2020. Polar research has been hard-hit by the pandemic in several ways. Many scientists could not conduct field experiments in remote polar regions such as the Arctic and Antarctica because of changing travel and quarantine regulations, canceled expeditions, and changing pandemic situations all over the globe in the past two years. The pandemic-related effects on polar science have resulted in gaps in the long-term essential scientific measurements to understand changes in various spheres of the polar regions. Space technologies and remote sensing (RS) are the only practical tools to fill these data gaps sustainably. More than 150 Earth observation (EO) satellites orbiting in space to acquire important data play an important role in monitoring changes in the Earth's polar regions. These EO satellites can be used to derive information to track changes in the cryosphere (e.g. glaciers), terrestrial (e.g. vegetation), marine (e.g. sea ice), and atmosphere (e.g. greenhouse gases) environments. However, the information derived from satellites needs calibration and validation using in situ measurements. The collection of in situ data has been badly hampered in the polar regions due to the pandemic. This study poses an important question, how many data gaps in in-situ measurements can be reliably filled using space technologies to understand changes in our polar regions? The Svalbard Integrated Arctic Earth Observing (SIOS) is an international partnership of 26 research institutions from 9 countries to build an effective observing system using in situ and space-based observations in Svalbard and associated waters. This interactive presentation will provide an overview of EO and RS-based activities developed by SIOS in response to the pandemic and fill the data gaps in long-term measurements. This includes (1) advisory services to use space technologies for those field scientists not adequately exposed to EO and RS capabilities, (2) involving residents (especially in the arctic) to save important in situ measurements necessary for validation of space-based measurements, (3) effectively patching up of field measurements with EO and RS, and (4) bringing space technology community and field scientists in polar science together to facilitate dialogue to address data gaps and possible solutions. SIOS's practical EO-based experiences, services, and lessons learned in pandemic situations will help prepare for future pandemics and strengthen Earth observation activities in normal conditions.