

EGU21-9129

<https://doi.org/10.5194/egusphere-egu21-9129>

EGU General Assembly 2021

© Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.



## SIOS's airborne remote sensing campaigns in Svalbard

**Shridhar Jawak**<sup>1</sup>, Agnar Sivertsen<sup>2</sup>, Veijo Pohjola<sup>3</sup>, Małgorzata Błaszczuk<sup>4</sup>, Jack Kohler<sup>5</sup>, Hans Tømmervik<sup>6</sup>, Lennart Nilsen<sup>7</sup>, Marta Majerska<sup>8</sup>, Thomas Kræmer<sup>7</sup>, Maarten J.J.E. Loonen<sup>9</sup>, Janne Søreide<sup>10</sup>, Dariusz Ignatiuk<sup>1</sup>, Øystein Godøy<sup>1</sup>, Inger Jennings<sup>1</sup>, Christiane Hübner<sup>1</sup>, and Heikki Lihavainen<sup>1</sup>

<sup>1</sup>Svalbard Integrated Arctic Earth Observing System (SIOS), SIOS Knowledge Centre, Svalbard Science Centre, P.O. Box 156, N-9171, Longyearbyen, Svalbard, Norway (remotesensing@sios-svalbard.org)

<sup>2</sup>NORCE Norwegian Research Center AS, Sykehusvn 21, 9019 Tromsø, Norway (agsi@norceresearch.no)

<sup>3</sup>Department of Earth Sciences, Uppsala University, Geocentrum, Villavägen 16, 752 36 Uppsala, Sweden (Veijo.Pohjola@geo.uu.se)

<sup>4</sup>University of Silesia in Katowice, Institute of Earth Sciences, Bedzinska 60, 41-200 Sosnowiec, Poland (malgorzata.blaszczuk@us.edu.pl)

<sup>5</sup>Norwegian Polar Institute, Fram Centre, P.O. Box 6606 Langnes, N-9296 Tromsø, Norway (jack.kohler@npolar.no)

<sup>6</sup>Norwegian Institute for Nature Research (NINA), Fram Centre, 9296 Tromsø, Norway (Hans.Tommervik@nina.no)

<sup>7</sup>UiT The Arctic University of Norway, Hansine Hansens veg 18, N-9019 Tromsø (lennart.nilsen@uit.no;thomas.kramer@uit.no)

<sup>8</sup>Institute of Geophysics Polish Academy of Sciences, Warsaw, Poland (mmajerska@igf.edu.pl)

<sup>9</sup>University of Groningen, Arctic Centre PO Box 716, 9700 AS Groningen, Netherlands (m.j.j.e.loonen@rug.nl)

<sup>10</sup>The University Centre in Svalbard (UNIS), P.O. Box 156, N-9171 Longyearbyen, Svalbard, Norway (JanneS@UNIS.no)

Svalbard Integrated Arctic Earth Observing System (SIOS) is an international collaboration of 24 research institutions from 9 countries studying the environment and climate in and around Svalbard. The global pandemic of Coronavirus disease (Covid-19) has affected the Svalbard research in a number of ways due to nationwide lockdown in many countries, strict travel restrictions in Svalbard, and quarantine regulations. Many field campaigns to Svalbard were cancelled in 2020 and campaigns in 2021 are still uncertain. In response to this challenge, we conducted practical activities to support the Svalbard science community in filling gaps in scientific observations. One of our activities involved conducting airborne remote sensing campaigns in Svalbard to support scientific projects. In 2020, SIOS supported 10 scientific projects by conducting 25 hours of aircraft and unmanned aerial vehicle (UAV)-based data collection in Svalbard. This is one of the finest ways to fill the data gap in the current situation as it is practically possible to conduct field campaigns using airborne platforms in spite of travel restrictions. We are using the aerial camera and hyperspectral sensor installed onboard the Dornier DO228 aircraft operated by the local company Lufttransport to acquire aerial images and hyperspectral data from various locations in Svalbard. The hyperspectral sensor image the ground in 186 spectral bands covering the range 400-1000 nm. Hyperspectral data can be used to map and characterise earth, ice and ocean surface features, such as minerals, vegetation, glaciers and snow cover, colour and pollutants. Further, it can be used to make 3D models of the terrain as well as searching for the

presence of animals (e.g. counting seals). In addition, aerial photos are particularly useful tool to follow the seasonal dynamic changes and extent in sea ice cover, tracking icebergs, ocean productivity (Chlorophyll a) and river runoff (turbidity). Data collected from the SIOS funded airborne missions will not only help to fill a few of the data gaps resulting from the lockdown but also will be used by glaciologists, biologists, hydrologists, and other Earth system scientists to understand the state of the environment of Svalbard during these times. In 2021, we are continuing this activity by conducting more airborne campaigns in Svalbard. In this presentation, we will specifically focus on the overview of projects supported by airborne remote sensing campaigns.