Near Real-Time Observations of Snow Water Equivalent for SIOS on Svalbard - SWESOS

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Project Aims

- Assess accuracy, spatial representativeness, applicability of **new automated monitoring technique** for measuring snow water equivalent (**SWE**) using a passive gamma ray sensor at the Bayelva site (Figure 1) and comparing with manual SWE validation data.
- Provide recommendations on potential to install more of these instruments in similarly remote environments in the future.
- Provide **unique, high quality, continuous, near-real time snow dataset** by linking existing snow datasets with new SWE measurements.
- The dataset will comprise SWE, snow height, snow spatial coverage (all three being ECVs), snow temperature and water content with hourly time resolution.
- It will link the soil (permafrost), snow, atmospheric and biological research fields and will be essential to develop snow, permafrost and hydrologic models in this data scarce region.

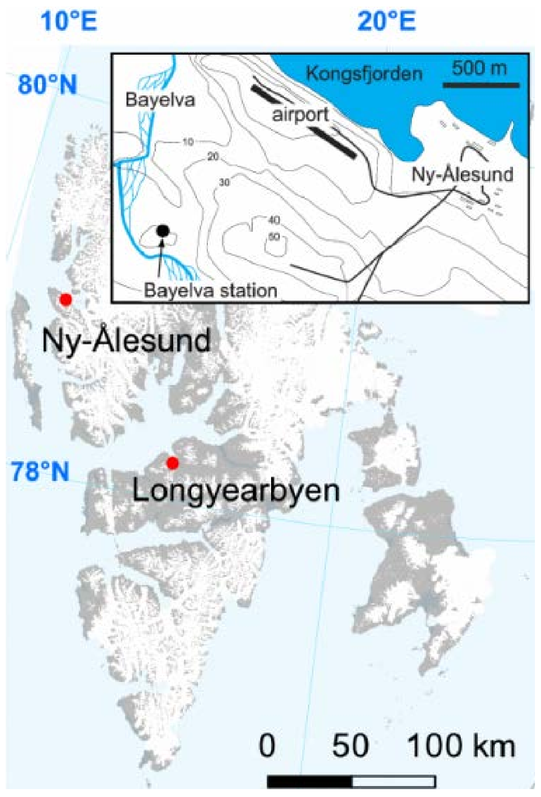

Figure 1. Location of the Bayelva site.

Snow parameters and sensors available for the SWESOS project

Table 1. Existing snow datasets for Bayelva station

Parameter	Sensor	Measurement Height [m]
Snow depth	CS SR50 ultrasound	1.5
	Jenoptik SHM30 laser distance	2.0
Snow temperature	2xPT100	0.04, 0.2
Snow dielectric number	TDR100, vertically installed	0-0.3
Snow distribution	Time lapse cameras (m^2 scale) Time lapse camera overlooking entire Bayelva catchment (km^2 scale)	2.35 474

Table 2. New automated snow sensors installed 29/08/2019

SWE	CS725	2.42
Snow depth	CS SR50/AT ultrasound	2.42

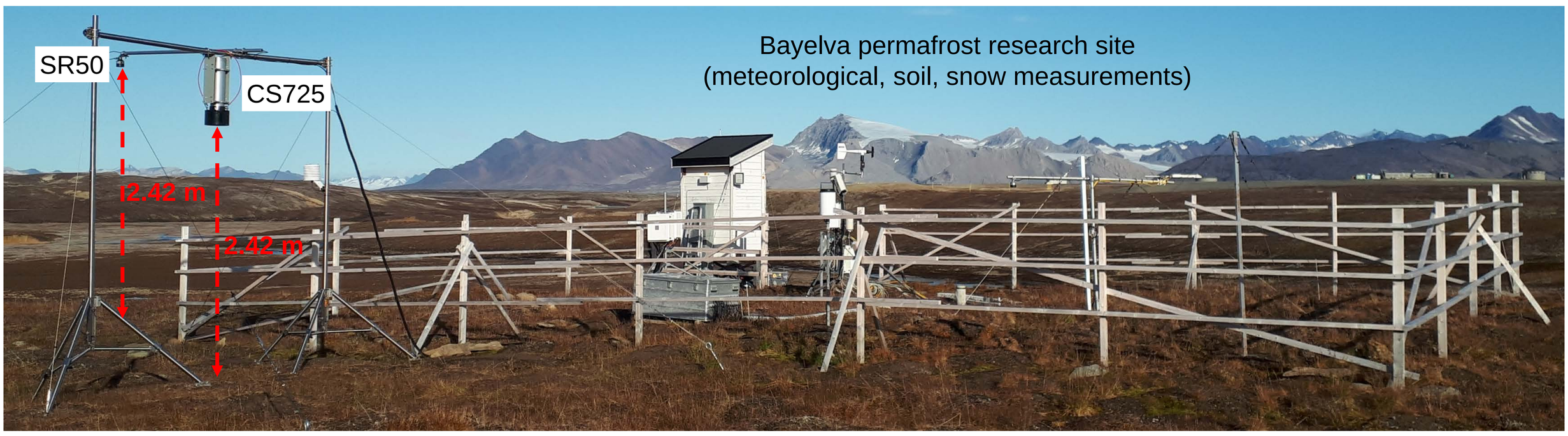

Figure 2. Overview of the Bayelva study site.

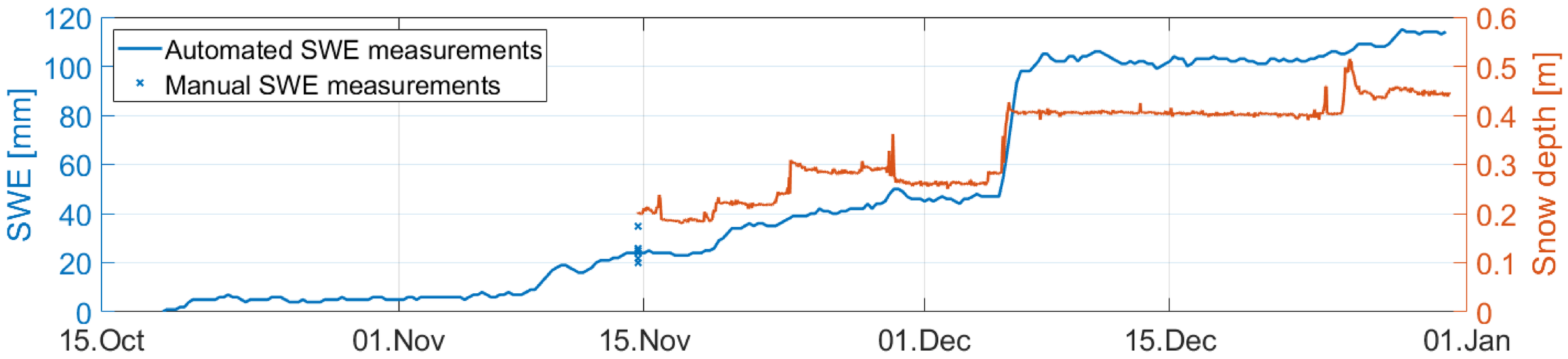

Figure 3. SWE and snow depth data collected since the installation of the new automated sensors in 2019.

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