

The Snow ALbedo eVolution (SALVO) Campaign
Metadata Document Date: April 18, 2023
Instrument: HOBO U23 Pro v2 External Temperature Data Logger

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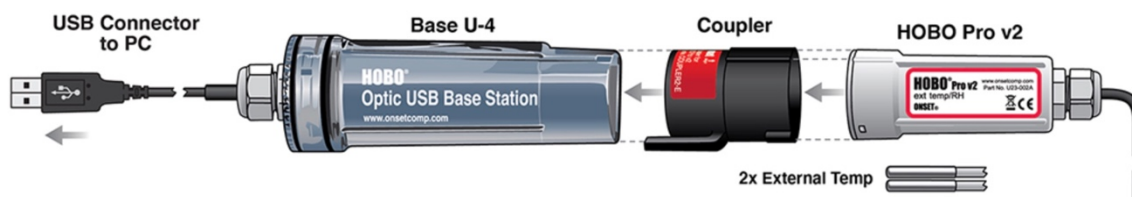
Author: Anika Pinzner

Instrument

Manufacturer: Onset

Website: <https://www.onsetcomp.com/products/data-loggers/u23-004>

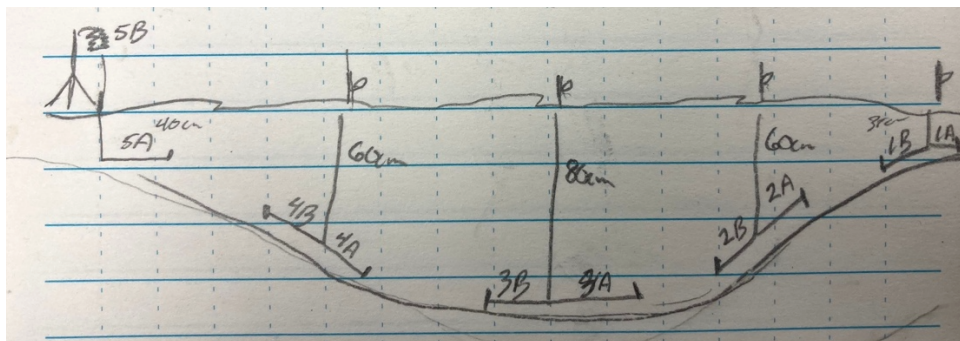
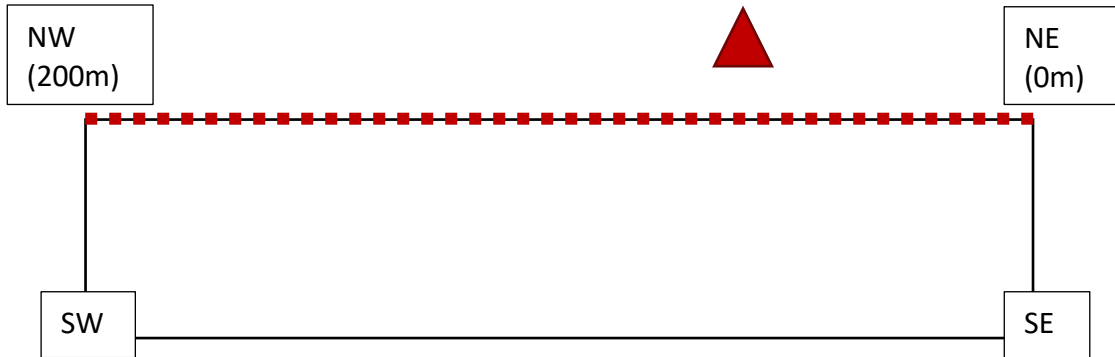
Description: A weatherproof data logger with two external temperature sensors on a 6-foot cable.



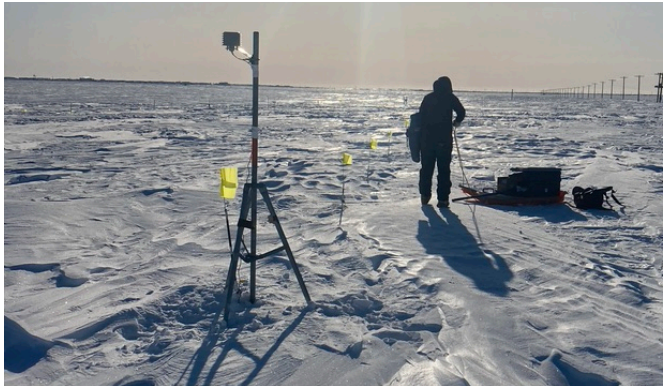
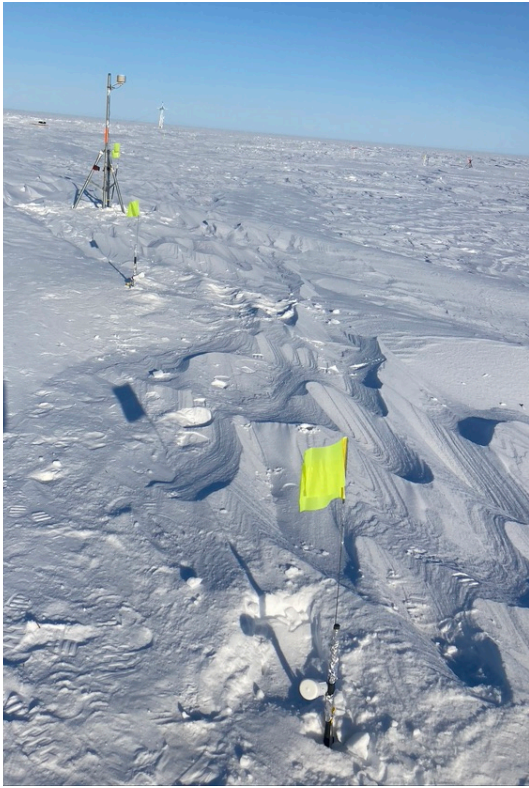
Placement and Usage

In addition to spot snow temperatures from snow pits, we installed BTS (Bottom Temperature Snow: Hiller et al., 2014) sensors connected to data loggers (Onset Computers model U23) at the snow-substrate interface. At each site, we chose a landscape feature representative of the respective site (ARM: drainage channel, BEO: LCP/ trough, ICE: barchan dune, CHK: drift apron after small pressure ridge). To install the sensors, we dug a narrow ~1.5m wide trench next to each of the five center-poles holding the loggers. The two sensors connected to each logger were subsequently placed diametrically to each other at each side of the trench at the snow-substrate interface. The small trench was then refilled with the snow blocks extracted earlier trying to disturb the snow minimally in the process. At each of the sites, an additional temperature sensor was placed in a small temperature shield to record local air temperatures, too. All sensors took instantaneous temperature measurements at a fifteen-minute interval between ~April 17 2022 and ~June 2022

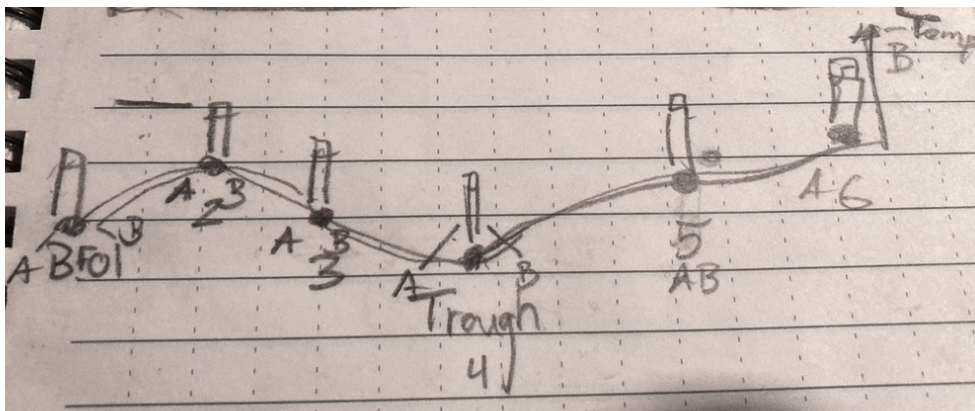
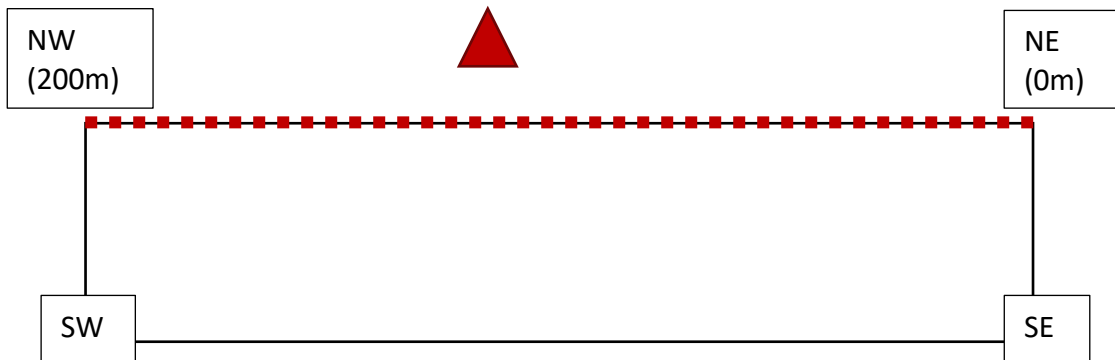
ARM - Sensors installed 04/17/2022



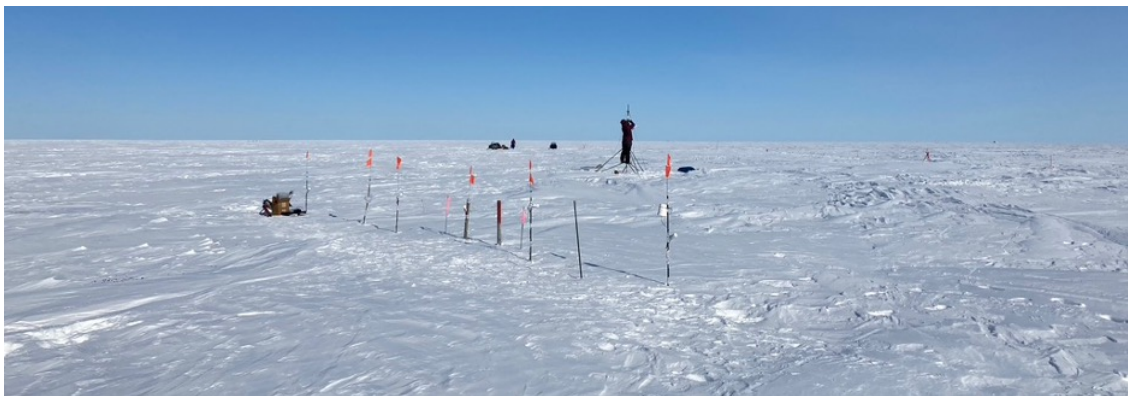
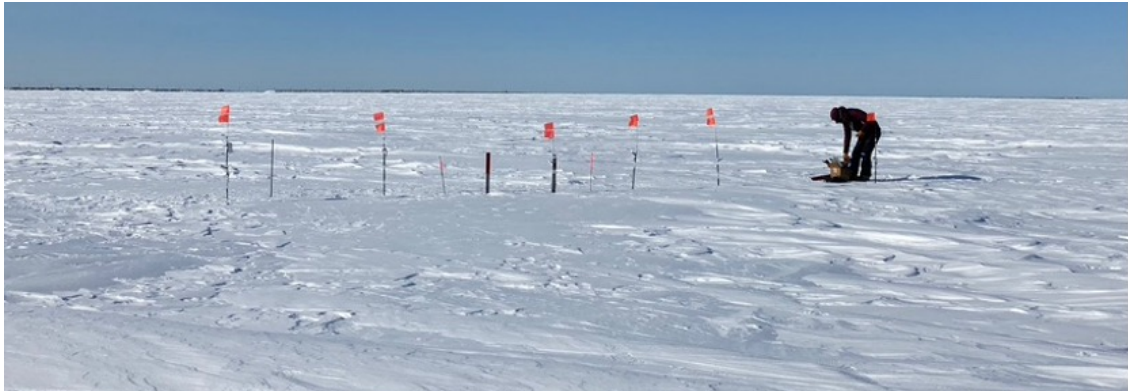
| Sensor Name | Initial Snow Depth [cm] | Distance from stake [cm] |
|------------------------|-------------------------|--------------------------|
| 1A | 38 | 80 |
| 1B | 42 | 85 |
| 2A | 60 | 95 |
| 2B | 59 | 83 |
| 3A | 79 | 48 |
| 3B | 81 | 48 |
| 4A | 79 | 65 |
| 4B | 69 | 60 |
| 5A | 45 | 90 |
| 5B (temperature probe) | | |



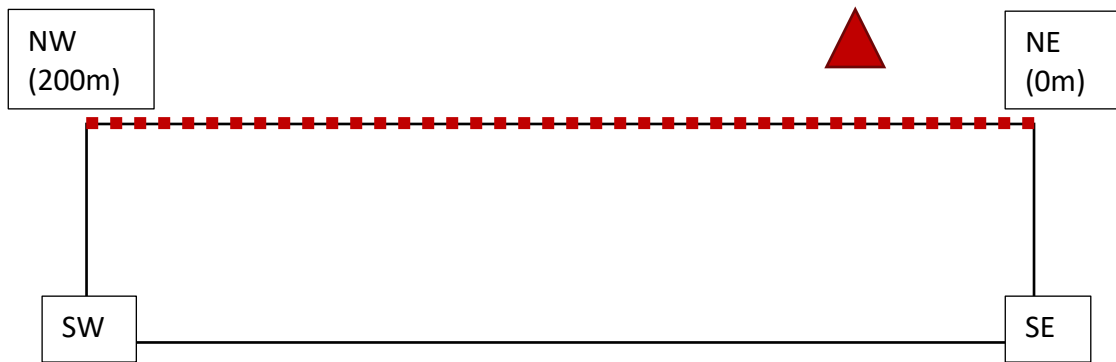
BEO – Sensors installed 04/19/2022

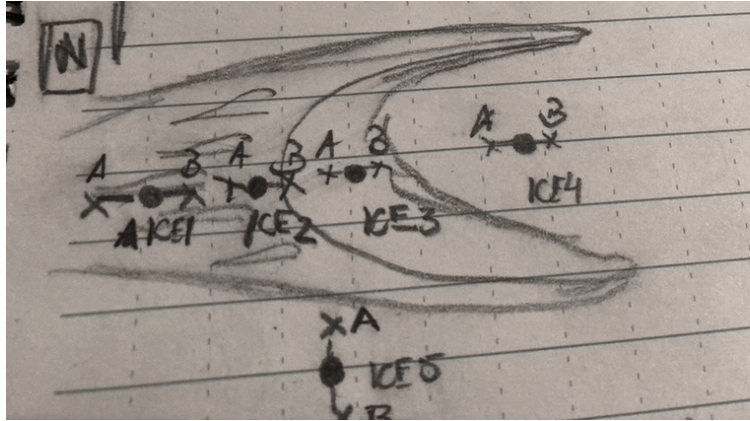


| Sensor Name | Initial Snow Depth [cm] | Distance from stake [cm] |
|------------------------|-------------------------|--------------------------|
| 1A | 34 | 43 |
| 1B | 39 | 50 |
| 2A | 34 | 15 |
| 2B | 33 | 28 |
| 3A | 40 | 33 |
| 3B | 52 | 35 |
| 4A | 51 | 26 |
| 4B | 55 | 53 |
| 5A | 41 | 48 |
| 5B | 32 | 70 |
| 6A | 25 | 17 |
| 6B (temperature probe) | | |

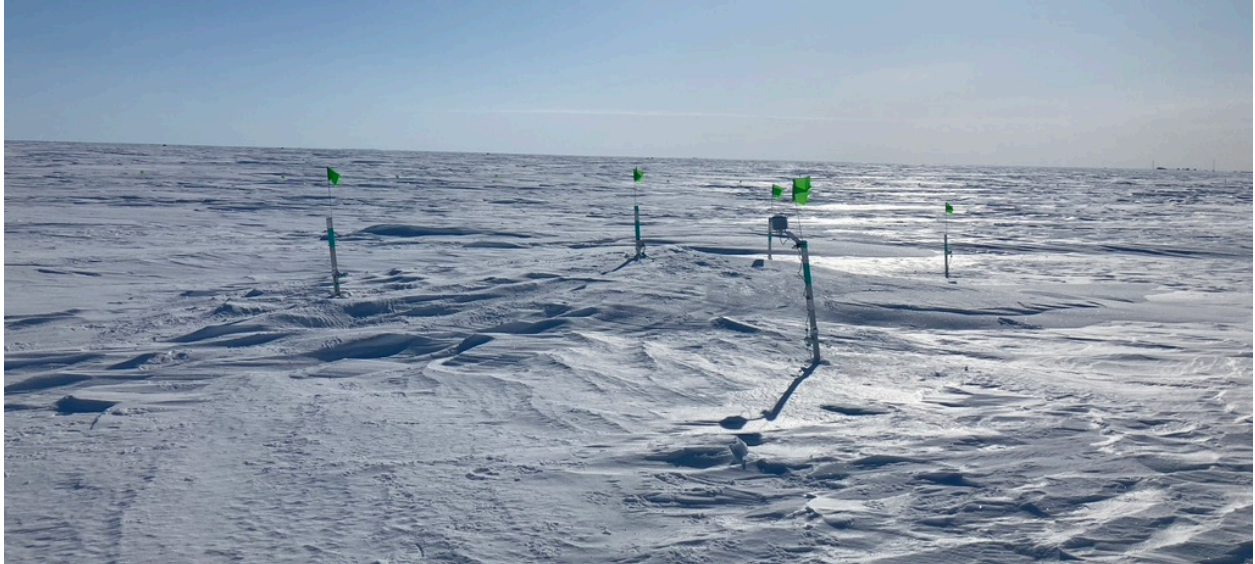


ICE - Sensors installed 04/18/2022

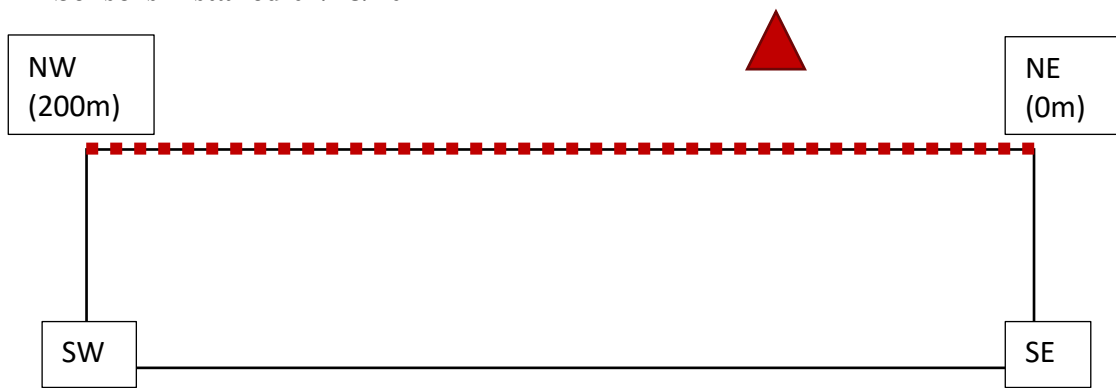




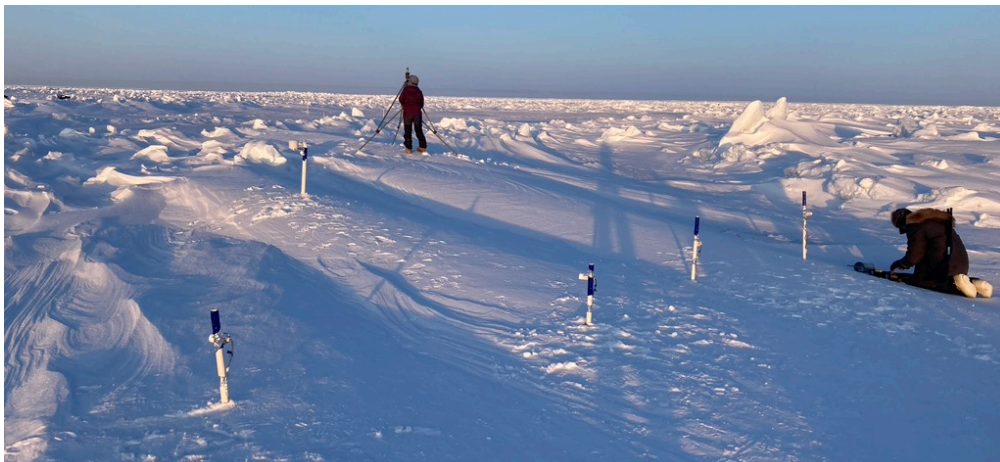
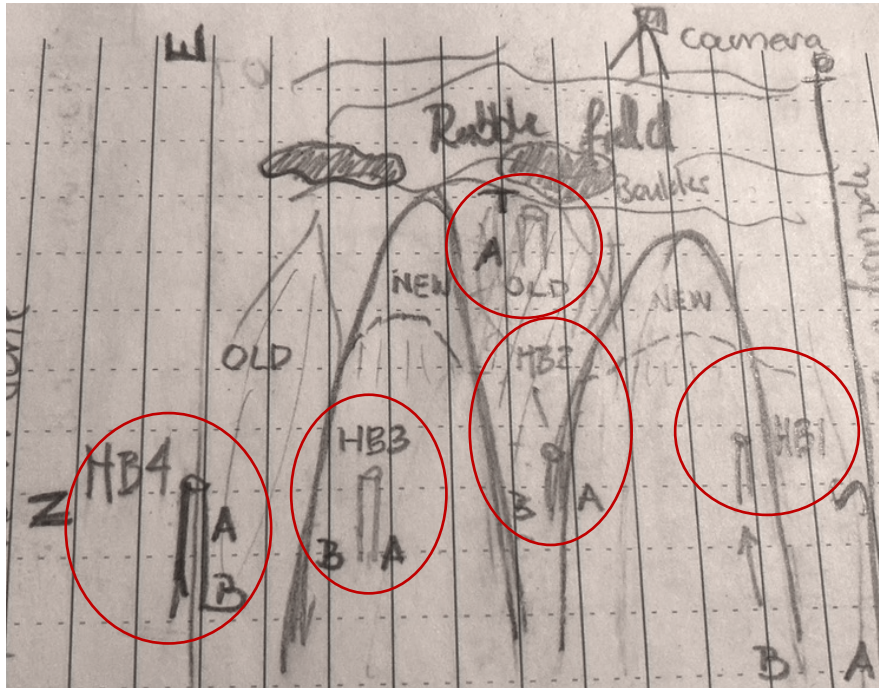
| Sensor Name | Initial Snow Depth [cm] | Distance from stake [cm] |
|-----------------------------|-------------------------|--------------------------|
| 1A | 47 | 53 |
| 1B | 52 | 67 |
| 2A | 69 | 54 |
| 2B | 73 | 52 |
| 3A | 52 | 59 |
| 3B | 31 | 87 |
| 4A | 19 | 97 |
| 4B | 15 | 86 |
| 5A | 30 | 52 |
| 5B (temperature probe/ air) | | |



CHK - Sensors installed 04/18/2022



| Sensor Name | Initial Snow Depth [cm] | Distance from stake [cm] |
|-----------------------------|-------------------------|--------------------------|
| 1A | 27 | 50 |
| 1B | 39 | 34 |
| 2A | 46 | 60 |
| 2B | 52 | 55 |
| 3A | 55 | 76 |
| 3B | 54 | 74 |
| 4A | 67 | 10 |
| 4B | 30 | 5 |
| 5A | 81 | 35 |
| 5B (temperature probe/ air) | | |



Data Processing Levels

- 00: raw, directly from instrument
- a1: data reformatted from raw file to .xlsx files

References

Hiller, C., Keuschnig, M., Hartmeyer, I., and Götz, J. (2014). Assessment of the temperature variability at the snow-ground interface-concept and first results. In *EGU General Assembly Conference Abstracts* (p. 14882).