

Physical Sea Ice Properties in the Winter Weddell Sea in 2013

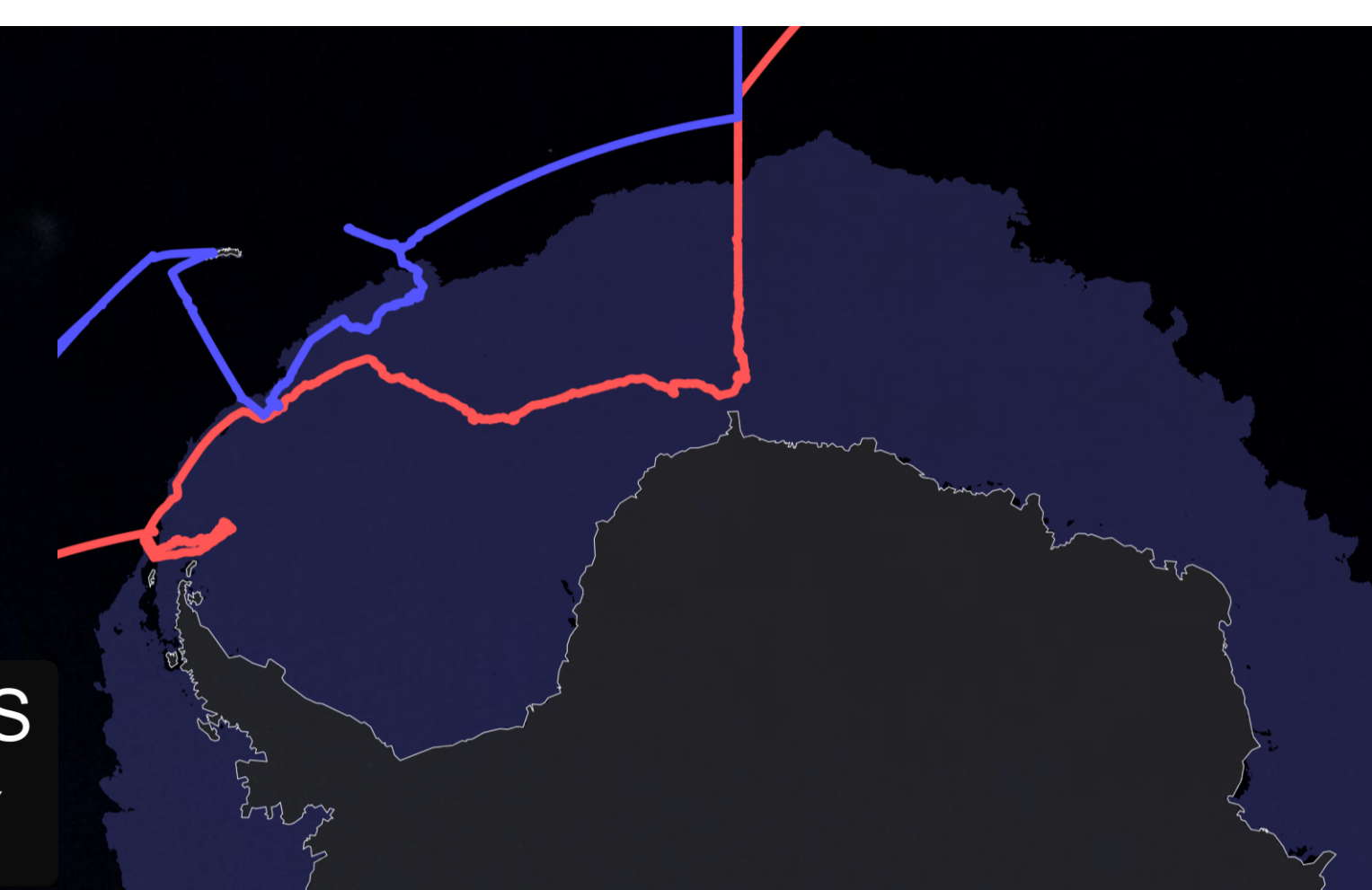
Polarstern Antarctic Winter Experiment 2013

AWECS *Antarctic Winter Ecosystem & Climate Study*
08. June – 12. August 2013

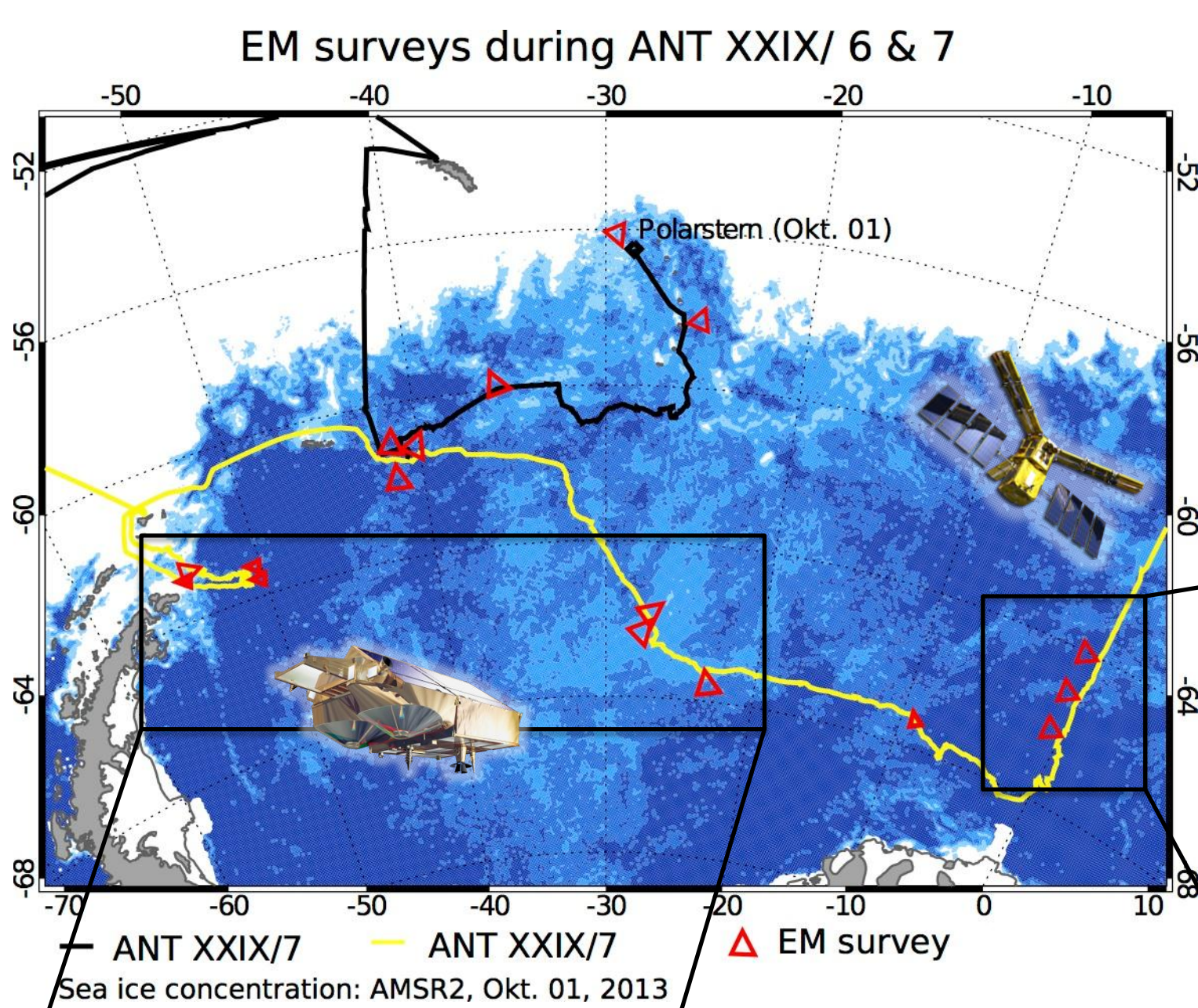
WISKY *Winter Sea Ice Study on Key Species*
14. August – 16. October 2013

Observation of physical sea ice properties In-situ / Airborne / Autonomous

- Up-scaling of observations with satellite remote-sensing data
- Seasonal variability of sea ice and snow
- Long-term variability and trends



Airborne EM sea-ice thickness surveys



MAiSE
(Multi-frequency Airborne Sea Ice Explorer)

Airborne EM sea ice thickness

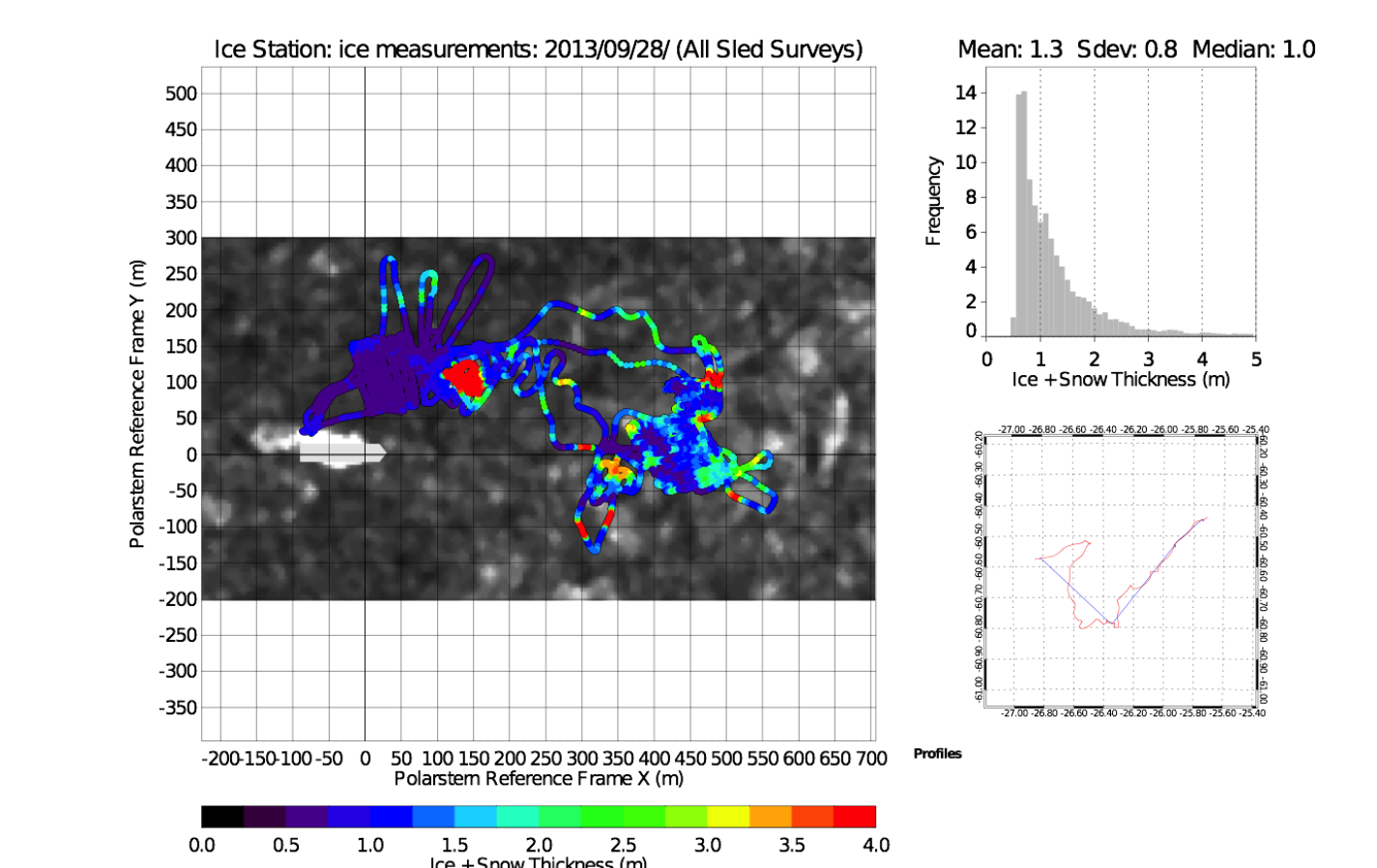
Nadir Aerial Imagery (INS platform)

SMOSice Cal/Val

Multi-Frequency EM Study



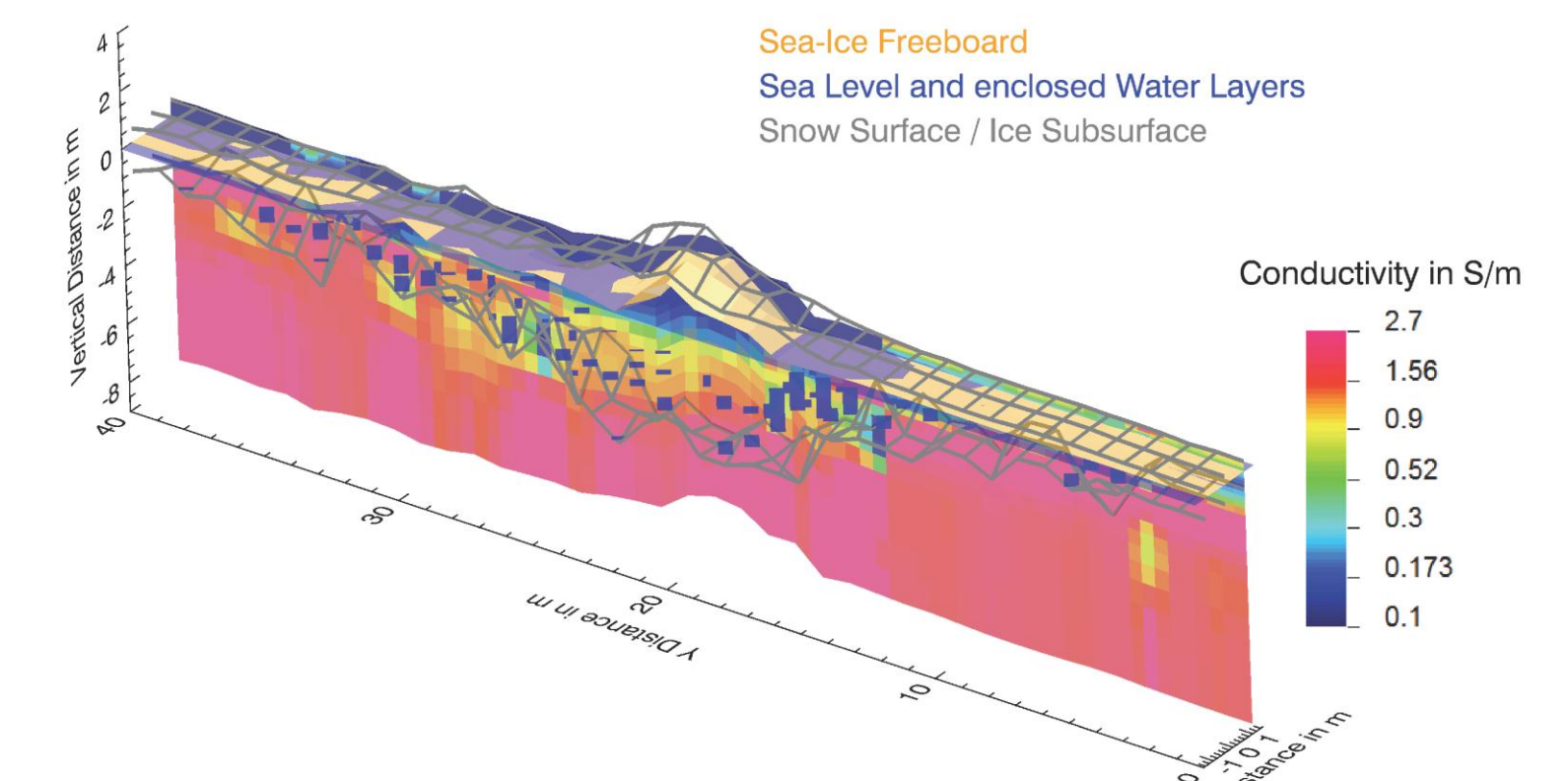
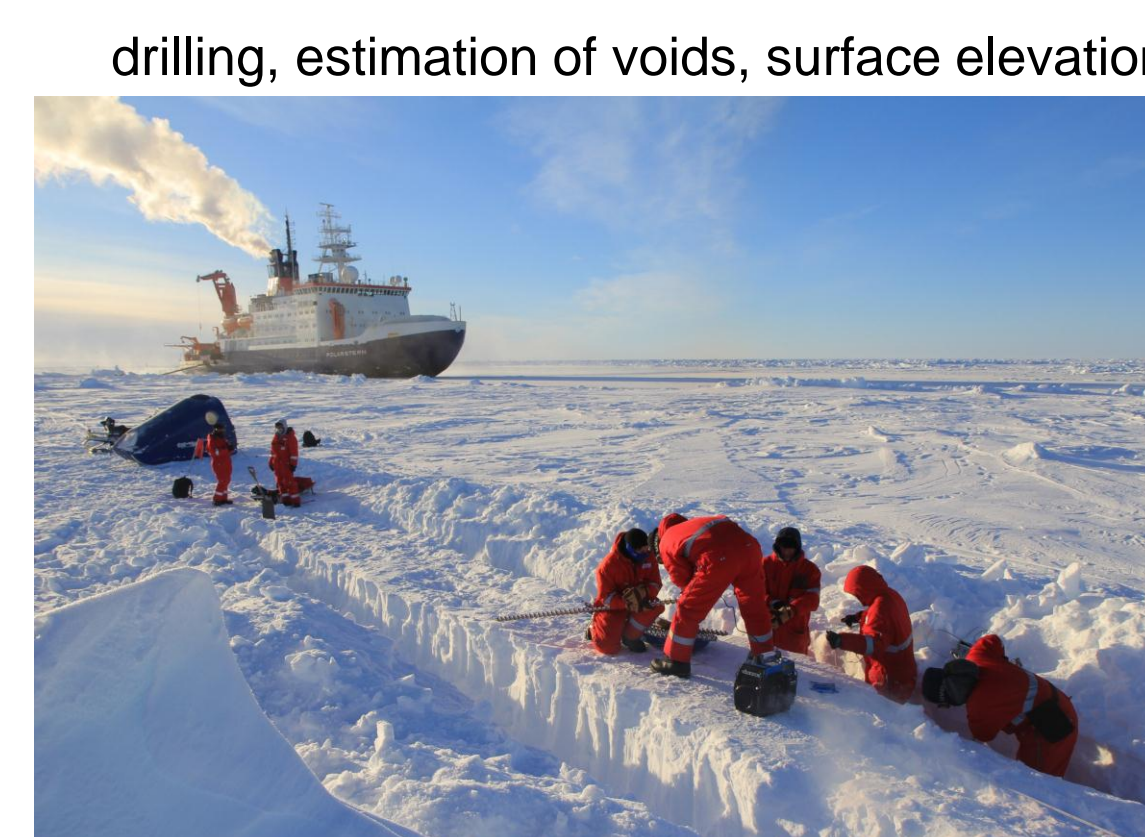
GEM-2 (Geophex Ltd.)
5 Frequencies
(1530, 5310, 18330, 63030, 93090 Hz)
Bluetooth communication interface
Joint profiles with snow-depth (magna-probe)



Joint Snow Depth and GEM-2 ice thickness
Background: NRT TerraSar-X (DLR)

GEM-2 ridge study

Inversion: EM1DFM (University of British Columbia)



ASPECT sea ice observations

Data over more than 30 years

- Seasonal variability
- Partly long-term changes
- Climatology

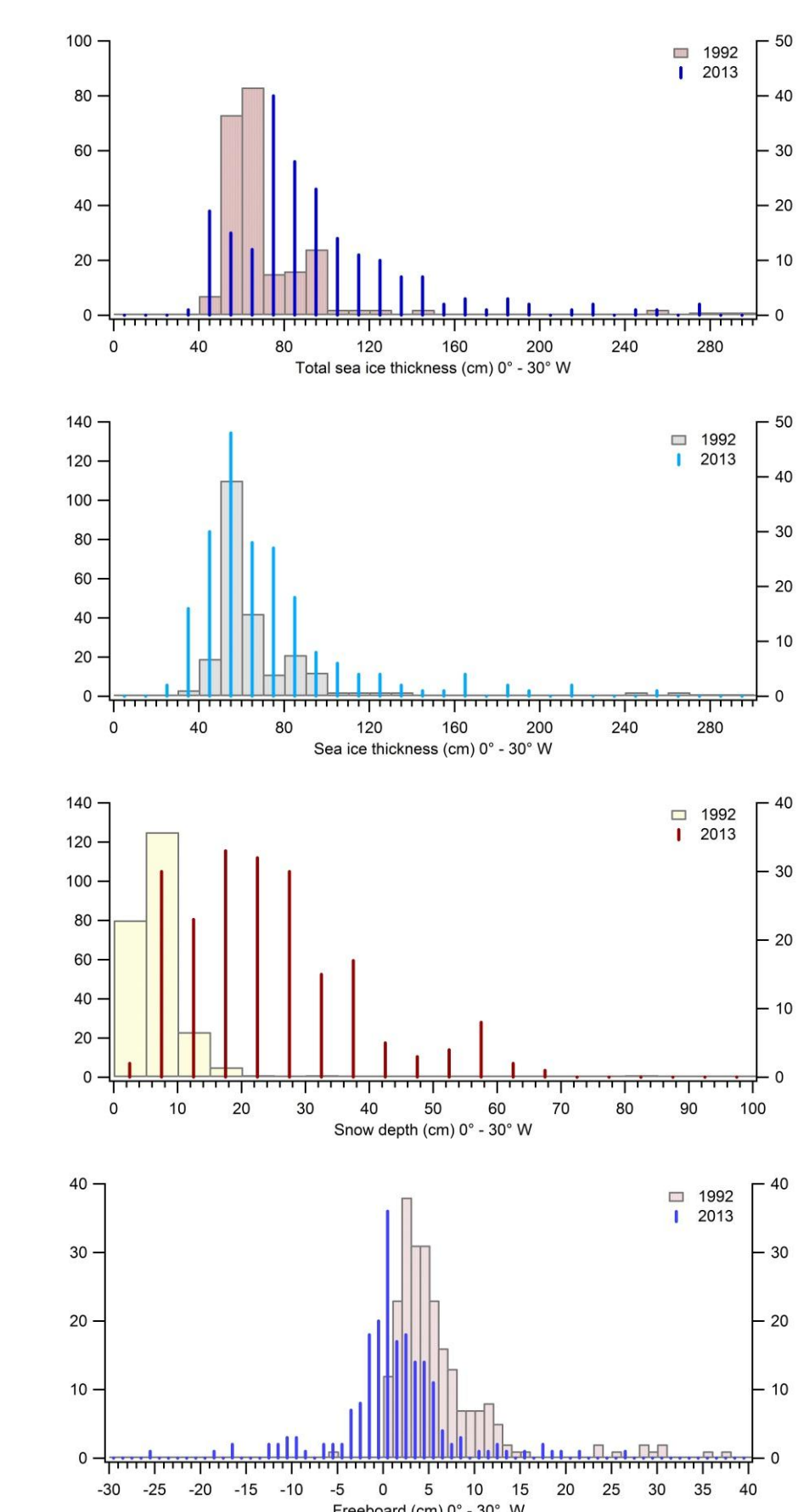
461 observations over 53 days (AWECS)

- Total sea ice concentration : 87.79 %
- Averaged level ice thickness: 64.35 cm
- Averaged ridged ice thickness: 94.5 cm
- Averaged snow depth: 20.73 cm

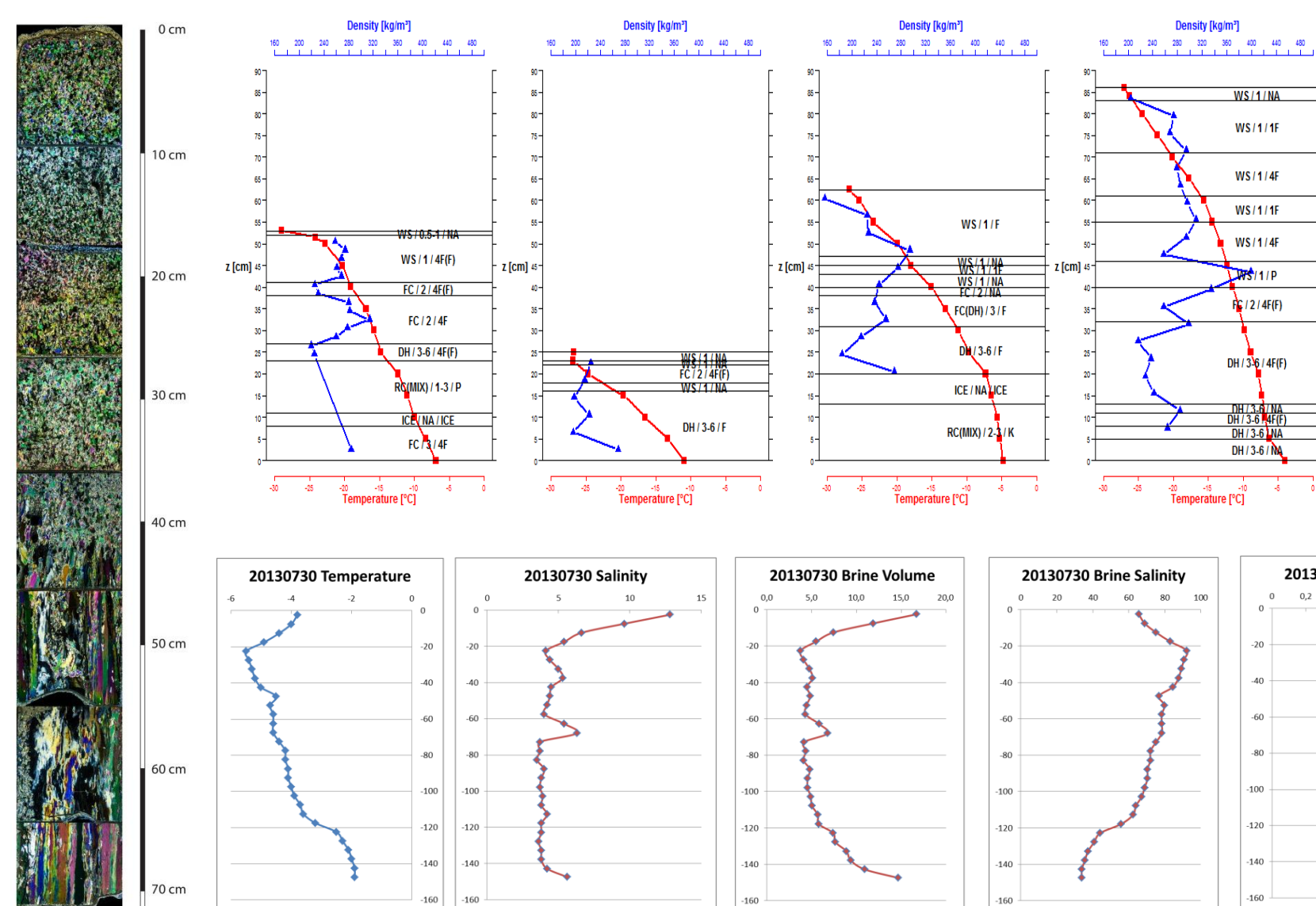
Observed properties:

- Sea ice concentration
- Ice type
- Sea ice thickness and snow depth
- Floe size and topography
- Meteorological conditions

1992 vs. 2013



Snow & Ice Cores

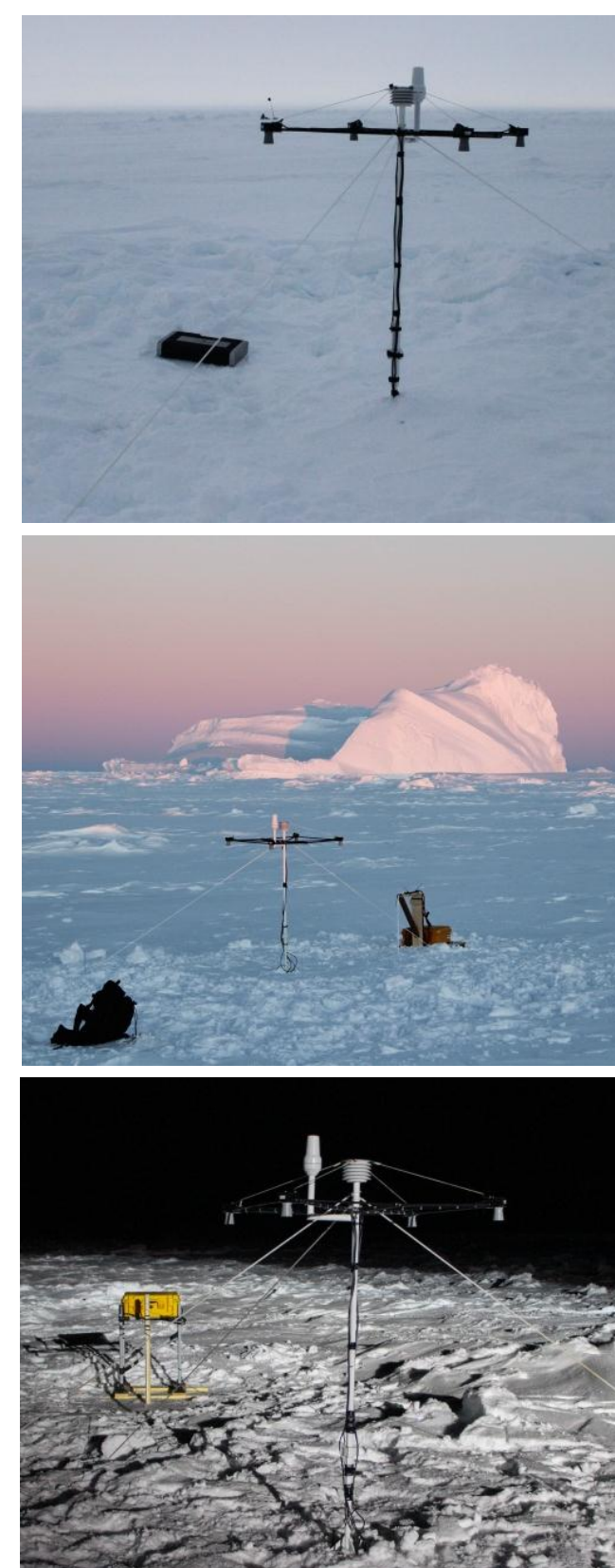


Snow pit stratigraphy
87 snow pits
Mean snow depth: 29.5 cm

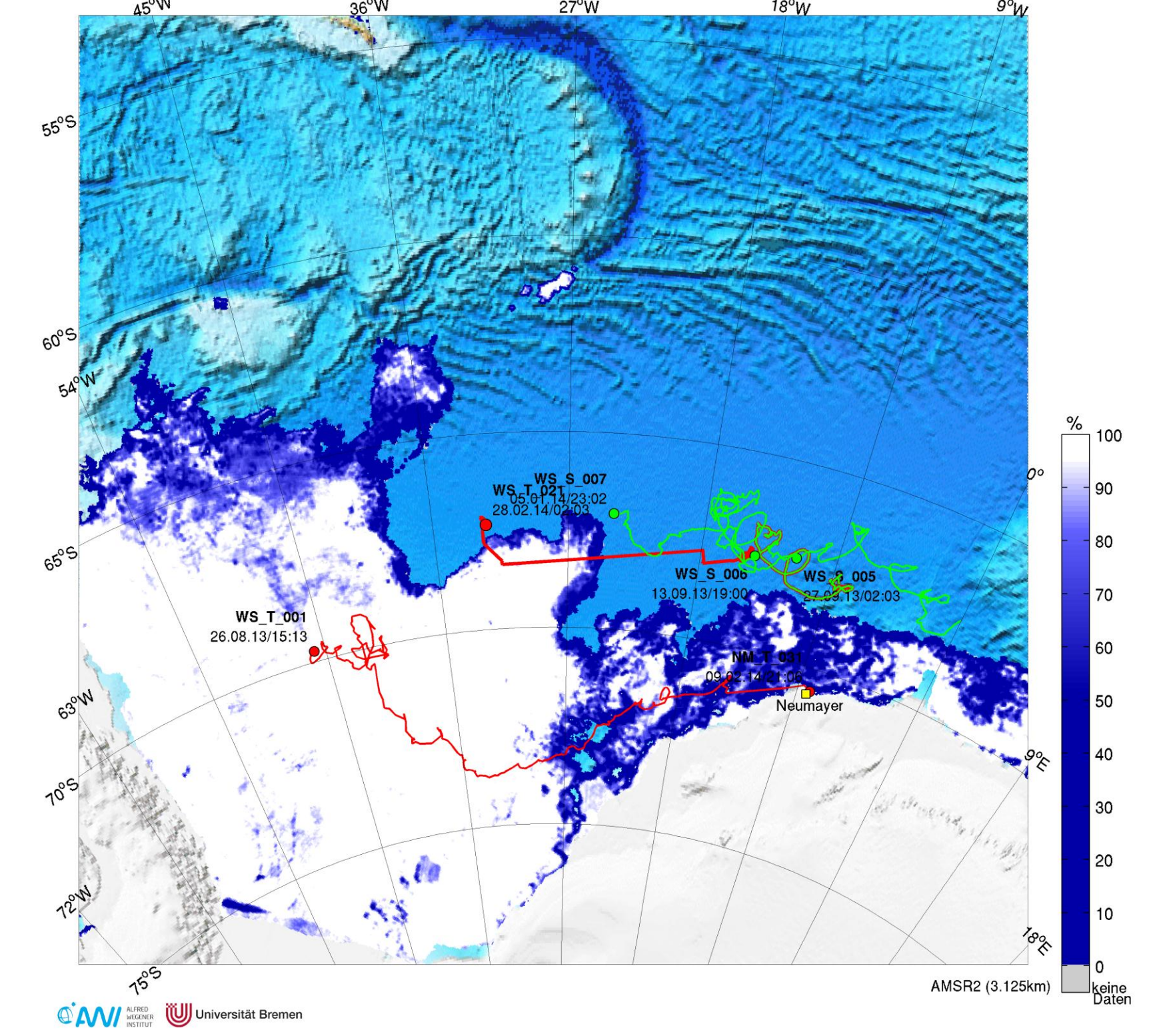
Ice coring with optical measurements at 16 sampling sites

Thickness range:
34 – 160 cm

Buoy Deployments



meereisportal.de buoy positions (27.02.2014)



Ice mass balance / snow-depth / GPS drifters

