Use of NoR - AGF-312 remote sensing of the cryosphere University Centre in Svalbard - UNIS

eero.rinne@unis.no

AGF-312 2023 on Longyear glacier during project fieldwork

NoR ID 3a092S

In a nutshell

- AGF-312 is a course teaching satellite remote sensing of the cryosphere, heavy on computer practicals and fieldwork.
- Intensive course over 5 weeks time. 20 students, 10 ECTS:
  a. **Total lecture hours:** 30 hours.
  b. **Total computer practical hours:** 48 hours.
  c. **Total seminar hours:** 8 hours.
  d. **Field excursions:** 4 days.

NoR funding allowed us to use dedicated virtual machines on Polar TEP https://polartep.polarview.org/ for teaching

PolarView created and configured the VMs with web interfaces for students, including required Python libraries and code from the teachers. Course took place in October and November 2023

Course work on Polar-TEP

Four long (2-3 h) computer practicals on P-TEP virtual machines using Jupyter notebooks:

1. Downloading and plotting Sentinel-2 data over Svalbard
2. Analysing ESA CCI+ sea ice concentration CRDP
3. Visualisation of CryoSat-2 waveforms over Austfonna Ice Cap
4. Combining drone and ICESat-2 snow thickness estimates

In addition, some students did the data analysis for their course project on their P-TEP

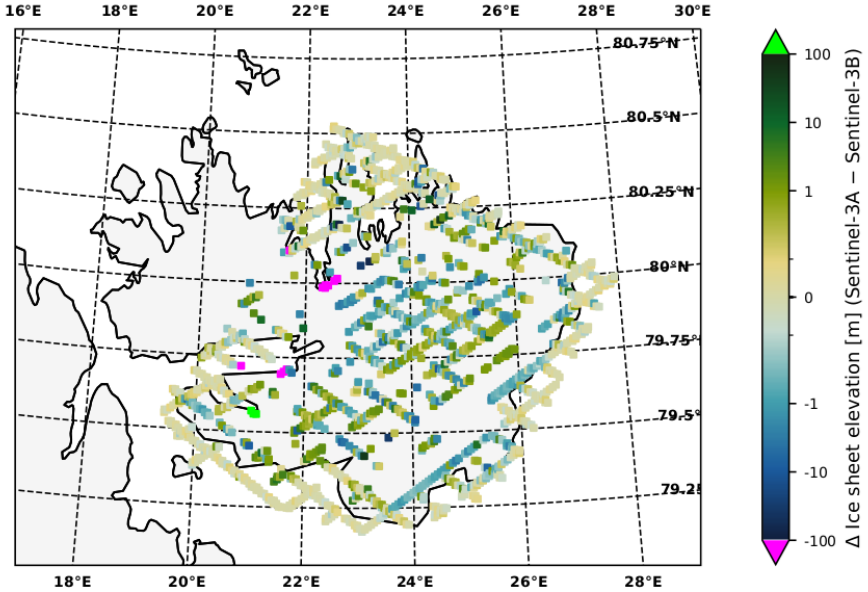

Figure 4: Ice sheet elevation difference in September/October.

Example from a student report where analysis was made on P-TEP

- Extremely positive experience and we plan to use P-TEP again in the future!
- P-TEP is a powerful tool for teaching
- Minor issues with the memory resources and latency - however, they taught students to optimize their code
- Students that wanted to do computationally heavy analysis learned the subject on P-TEP and then ran the code locally on their own laptops.

NoR 3a092S funding allowed us to teach satellite data processing on an ESA exploitation platform