Snow Weather And Glacier network

SWAGnet

C.P. Borstad¹,4, S. Filhol², J.C. Gallet³, J. Hulth², C. Nuth², T.V Schuler¹,2
Recording data

Technological development during my time as a student...
This millenium: New aspects

Low-cost, distributed systems

real time data

Photo by Thorben Dunse, 2016
UiO weather WSN: *From sensing to data*

A custom-made full-stack system designed around the specific needs for geosciences

**Sensors (v1):**
- $T_{\text{air}}$, P, RH
- Snow depth
- 16 bands VIS-NIR outgoing
- Wind speed and dir
- $T_{\text{surface}}$
- GPS lat/long
- $T_{\text{snow}}$ profile

**Logger:**
- power management
- sensor sampling
- communication
- data storage

**Communication:**
- Local IoT: Lora/xbee
- Iridium
- 4G

**Database:**
- long term storage
- data readily available
- data visualization
- adapted maintenance

**All-in-one beam:**
Sensors + power management + logger + radio
Specifications:

➢ Low power consumption
➢ Open source software/hardware
➢ Analog/digital sensors
➢ Low cost
Kongsvegen
SWAGnet

snow

weather

glacier

network
Access grant...

Kongsvegen on the way to a new surge?

Access may become prohibitively expensive...

Courtesy of J. Kohler, NPI
Summary

- Bring together:
  - Distributed, low-cost systems
  - Real-time data transfer
  - Geoscientists
  - Informatics/microelectronics

- SIOS deployment in steps:
  - Sensor stations, transmit system health
  - Gateway, network communication