



Project acronym: Deep Sense

Project title: Multisensory Submersible Drifters to Study Glacial Water Flow

Project leader: Maarja Kruusmaa, Tallinn University of Technology, Estonia

Discipline: Earth Sciences & Environment: Other - Earth Sciences

Station(s): Ny-Ålesund Research Station - Sverdrup (Svalbard/Norway)

The global importance of glacier dynamics is undisputed, nevertheless the fundamental processes connecting subglacial hydrology to glacier dynamics remain poorly understood. Our aim is break through this knowledge gap by directly measuring both the surface and subsurface glacial water flow with autonomous underwater multisensors at tidewater glaciers located next to Villum and Sverdrup Research Station. GNSS-enabled surface drifters will record the supraglacial underwater environment via high-frequency (100 Hz) measurements of pressure, temperature and the inertial response (acceleration, rotation rate and magnetic field). Concurrently, identical data will be collected in sub-surface englacial channels using submersible sensors. The data will be combined to generate a new method for the measurement of pressure, flow velocity, turbulence and morphology in glacial environments. This will provide unprecedented insight into the pressure distribution and flow variability in subglacial systems and allow for new glacier dynamic models.