Project description:

Permafrost soils store twice more amount of carbon than what is in the atmosphere. Global scale warming has led to permafrost to thaw, releasing this large amount of carbon to the atmosphere as CO_2 and CH_4, and potentially accelerating global warming (aka positive feedback to climate). Climate scientists predict that permafrost carbon release could be one of the largest positive climate feedback created in the terrestrial system and therefore CH_4 in the permafrost zone is one of the hottest topics environmental agencies all over EU are focused on. However, processes related to CH_4 emissions are still not well understood and year-long measurements are scarce due to environmental conditions. This created large uncertainty in understanding and predicting the patterns of future climate. The newly funded project entitled 'Advancing permafrost carbon climate feedback – improvements and evaluations of the Norwegian Earth System Model with observations (FEEDBACK)' will use automated observational technique to collect CO_2 and CH_4 under thawing permafrost to quantify CO_2 and CH_4 emissions from the ecosystem under permafrost thaw. The data collected will be used to evaluate and improve CO_2 and CH_4 dynamics under thawing permafrost within the land surface model of the Norwegian Earth System Model. This is a highly interdisciplinary and international project that will provide excellent opportunity for the student to develop a career in the academics or industry.

The MS project:

A MS project includes field observations of CO_2 and CH_4 emissions in permafrost affected ecosystems of Norway. Field sites will be established in Finnmark and sensors for CO_2 and CH_4 observations will be installed accordingly. The environmental measurements such as soil C, soil T, O_2 availability, redox potential of soil, soil texture, soil pH, and etc. will be taken as well. The observational system will be highly automated and will allow observations through the winter months. The MS student will analyse the data to 1) quantify the annual CO_2 and CH_4 balance, and 2) understand the processes related to CO_2 and CH_4 emissions.

What we offer:

- Scientific training in terrestrial biogeochemistry, land-atmospheric interaction, and permafrost
- Training for conducting field observations of CO_2 and CH_4 fluxes
- Technical training to operate CO_2 and CH_4 analyzers
- Training in statistical data analysis
- Training in communications and scientific writing
- Collaborations across different discipline (biology, atmospheric sciences, geoscience, climate modelling)
- Opportunity to visit Norwegian or international institutions for training (Oslo, USA, or Canada)

Interested students should contact Prof. Joachim Reuder (Joachim.Reuder@uib.no) or Dr. Hanna Lee (hanna.lee@uni.no) for more information.