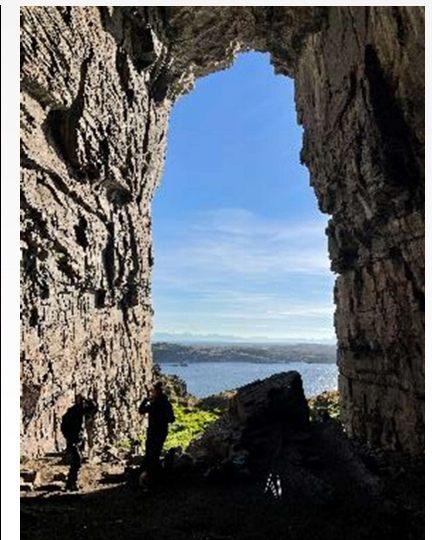
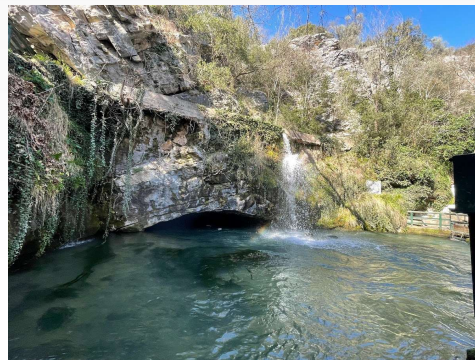
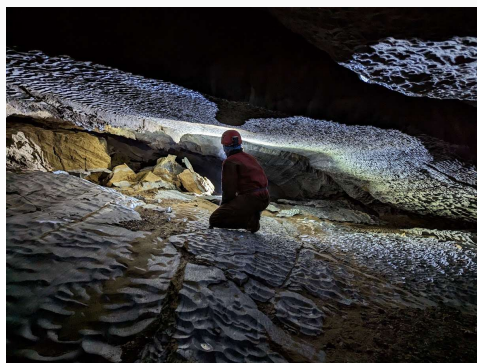


Rannveig Øvrevik Skoglund

Associated professor in physical geography

Research interests:

- Caves, speleology and landscape development
 - Karst caves and coastal caves
- Groundwater and karsthydrology
 - Hydrodynamic function of underground systems, water supply and contamination issues
- Water related geohazards like flooding, slope stability, subsidence and sinkhole collaps
- Reconstruction of the deglaciation history, ice dammed lakes and canyon development
- How climate and environmental changes and human activity influence on hydrological systems





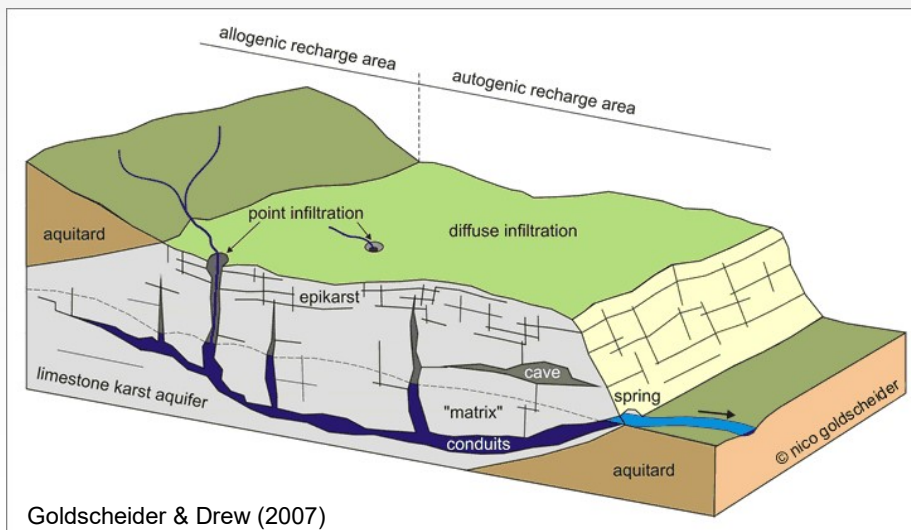
Karst and cave related projects

Background

Karst caves are landforms formed by the dissolution of soluble rocks like marble and limestone. Caves contain sediments, speleothems, remnants of animals and plants, unique microbes and pristine surfaces that are a rare resource today. The stable environment with minimal outside influence makes the caves unique depositories for geological, faunal and climatic history.

However, it also makes the caves vulnerable to impact since a footprint can remain for thousands of years. Caves are a red-listed nature type in Norway. New developments such as wind farms and road routes lead to new karst areas being affected and can provide easier access for the general public to unexplored and vulnerable caves.

It is possible to work with **various topics within the theme of karst and caves**: speleogenesis (cave development) in a glacial landscape, water resources, geohazards, vulnerability and risk assessment.





Karst and cave-related master's projects

Potential research topics

- Make a plausible model for the formation of a cave based on mapping and documentation of the caves' extent and morphology, the content of sediments, bones, speleothems and any archaeological traces.
- Determine when the cave was last active and if the deglaciation left any traces in the cave.
- Hydrological investigations of active underground systems to assess the system's volume, flow route(s), residence time and dynamic function, water quality and contamination issues related to water supply, and the possible effects of changes in the drainage area.
- Assess the cave's vulnerability and conservation value.
- Map the effect of visitors and tourism on selected objects and document the current condition and physical wear and tear in areas where the growth in the number of visitors is expected due to increased accessibility.

Methods

Cave mapping, sediment mapping and analyses, stream basin analysis, U-series dating, radiocarbon dating, hydrological tracing experiments, water flow measurements, monitoring of hydrological and meteorological parameters by establishing automatic stations, water sampling and analyses, GIS, photogrammetry, remote sensing (Lidar and InSAR data), etc.

Field sites: Nordland County, in Fauske, Rana or Sørfold, depending on the number of students and their interests.

Fieldwork in caves requires at least two persons!



Karst landscape

– inventory, risk and vulnerability assessment

1-2 master projects **Co-supervisor:** Terje Solbakk (NGU)

1. Assessment of risk and vulnerability in karst at Bjørnåfjellet and Røvassdalen, Rana municipality, Nordland

Present a detailed survey of the diversity and extent of exokarst features and subsurface drainage at Bjørnåfjellet and Røvassdalen. Make a vulnerability assessment of this type of karst landscape and the water resources. Produce a risk assessment and vulnerability map of geohazards in such a karst landscape.

2. Karst depressions and GIS analyses

Present an inventory of karst depressions for a few geographically constrained areas. Improve the accuracy of the existing geological maps and survey stratigraphical and structural elements controlling karst features. Elaborate on the classification of karst landforms and how to present data related to risk and vulnerability assessment of geohazards in the karst landscape.

Methods

Field survey of karst surface landforms (description of morphology, size measurements and position), geological survey including structural and stratigraphical elements measurements, water tracing of subsurface flow routes, GIS analyses, statistical analyses, risk, vulnerability and value assessment.

Fieldwork: 2-3 weeks



Flood history and hydrodynamic function of Maaras cave, Greece



1-2 master projects **Co-supervisor:** Dr. Christos Pennos

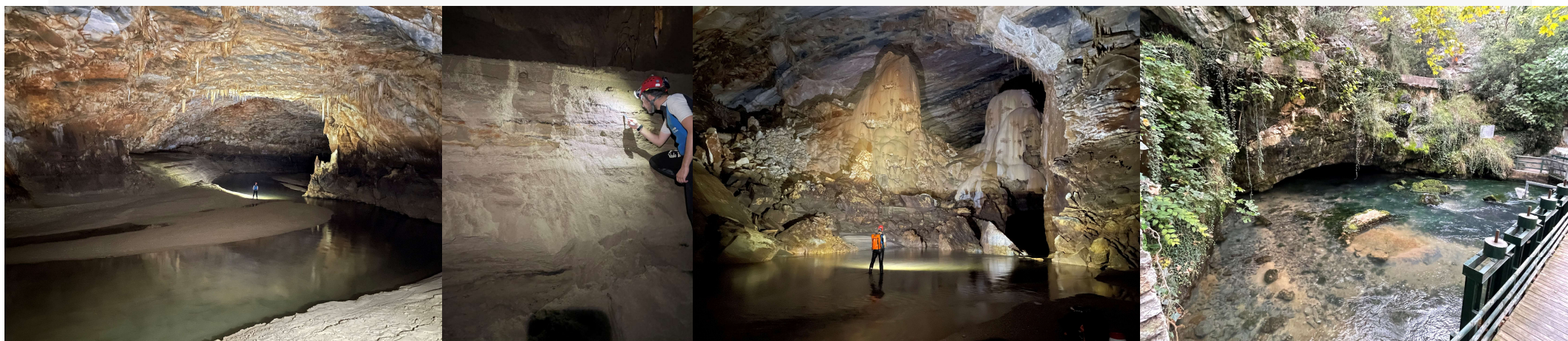
Maaras is an extensive river cave in northern Greece. The cave drains the Nevrokopi polje, a significant karst depression with a flat floor, and the cave is the spring of the Angittes River, which drains through the Drama basin. Maraas cave is surveyed to a total length of about 12 km, and the trunk passage comprises a series of cave chambers connected by siphons that are accessible during the dry season. More than 30 m of sediment is deposited on the cave floor, and terraces of fluvial deposits are present along the cave stream.

Objective: Understand the hydrodynamic function of the extensive river cave and how and when sediments are deposited and transported through this system.

Make a conceptual model for the flood function of the cave system and the role of back flooding.

Methods: Analyses of hydrological data from automatic monitoring stations, maybe analyses of water samples, stratigraphical investigations of sediments in terraces, sediment analyses, dating of cave deposits by applicable methods (OSL, ^{14}C or U-series), ERT data, etc.

Fieldwork: 5-10 days (Challenging conditions, no claustrophobia!)





Water resources and geohazards in karst

Background

The Norwegian Road Authorities (Statens Vegvesen) is constructing a new route for road E6 through Sørfold municipality, Nordland. In this area, the new road section will cross several layers of marble with cave systems and underground streams. It is of great interest to document the underground hydrological systems in the area to assess how the system will be affected by road construction (both during and after). Furthermore, we want to assess whether the underground systems are potentially hazardous to the construction work or the finished road.

Objective

- Map cave systems and karst surface features focusing on dolines, sinkholes, sinking streams and springs.
- Identify underground flow routes and estimate aquifer characteristics (karst aquifers) and the hydrodynamic function and assess the chemical and possibly ecological condition of the water bodies following the Water Directive and assess the vulnerability of the aquifer
- Assess the risk of impact on the underground hydrological systems during and after the road construction
- Assess the hazard of sinkhole formation in the area

Methods

Field survey with a focus on karst features, hydrology and marble outcrops. Cave survey, mapping of sinkholes, GIS, Lidar and photogrammetry, hydrological investigations such as tracing experiments, discharge measurements, the establishment of automatic measuring stations, water sampling, etc.

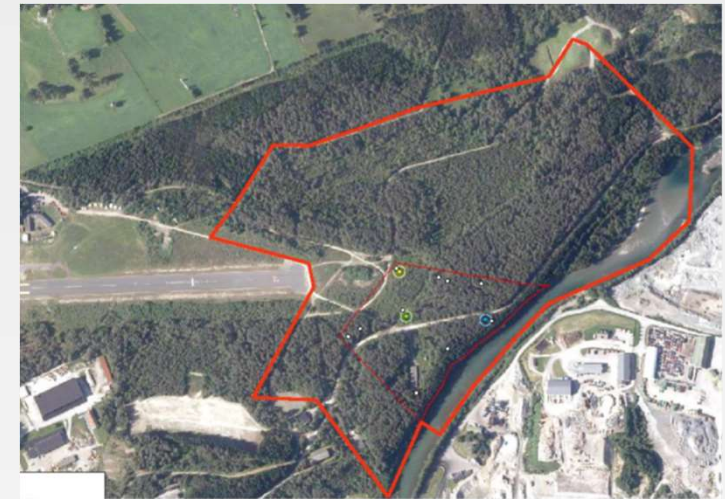


Groundwater projects

- If you are interested in working with projects related to groundwater issues such as water supply, contamination, subsidence, slope stability, etc. please contact me.
- Previous collaborators are COWI, NGU (Norwegian Geological Survey), Voss municipality and Western Norway University of applied sciences in Sogndal.



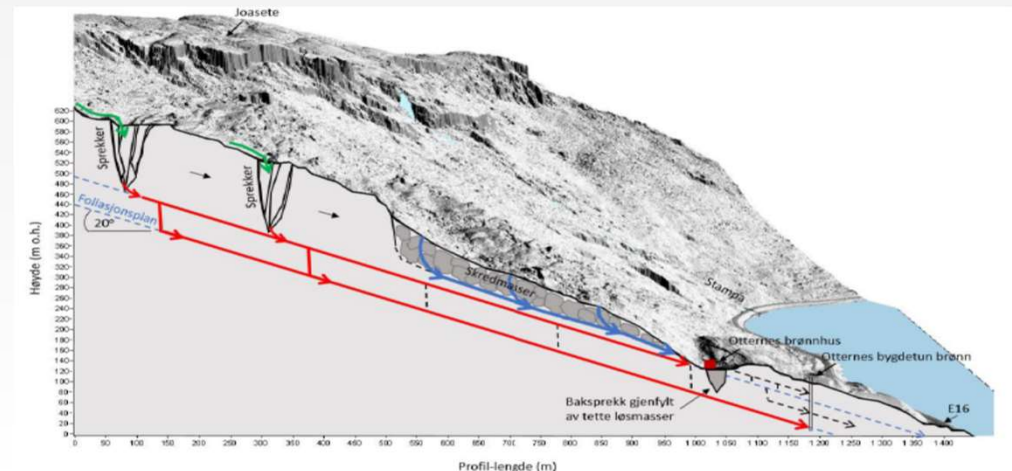
Former masterstudent Kjetil Bø Omarstrand measuring electric conductivity in a spring in Osa.



Recommended protection zones surrounding the new water works at Bømoen, Voss, a new water supply for Voss municipality. Map made by former masterstudent Line Haukanes, 2018.



Suceptibility map showing areas i Bergen that are subsiding. Data from InSAR. Made by former masterstudent Joakim Haukedal, 2017.



Conceptual model showing two different drainage systems in the unstable rock slope of Joasete-Høgsete in Flåm. Model developed by former masterstudent Berit Soldal, 2018.



If you are interested in a master project on water or karst-related issues.

Please contact me at:

rannveig.skoglund@uib.no

or come and see me at:

room 717, Dep. of Geography, Lauritz Meltzers hus