UNIS
The University Centre in Svalbard

Guest Master thesis topic in Quaternary Geology in the Department of Arctic Geology

Title:
The Deglacial to Postglacial sea level record and emergence history of Isfjorden, Spitsbergen

Period:
Commencement Spring 2024 or later,
6-12 months

Supervisors:
Mark Furze: markf@unis.no
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Project description:
Determining the detailed pattern of deglacial to postglacial sea level change in Svalbard is essential for constraining models of deglacial ice sheet behaviour, neotectonics, and palaeoclimate. However, despite decades of work, sea level histories remain poorly resolved due to patchy coverage, poorly constrained sea level index points, and chronological uncertainties.

This masters project will, through summer fieldwork, derive new and improved ^{14}C-constrained emergence curves for one or more key sites in Isfjorden. In addition, the project will develop an open-access database of sea level index points and emergence curves, scoured from the existing literature; quality-controlling, assessing, and integrating all data points for Isfjorden and adjacent coasts. Detailed statistical analyses of these data will then be performed to provide well constrained isobase and palaeoshoreline maps for the central Spitsbergen region from deglaciation through the Holocene, updating and advancing the work of Foreman et al. (2004).

Together, this will permit the exploration of important geomorphic research questions such as: evidence for or against (and potential causes of) an Early-Mid Holocene marine transgression as previously described from Isfjorden and the west coast of Spitsbergen; changes in sediment supply and storminess during the Holocene; and variations in isostatic rebound controlled by ice mass thickness and geologic structure.

Techniques used may include: ^{14}C dating and pumice analysis, GIS mapping, altimetry, air photo analysis, UAV photogrammetry and DEM construction; statistical analysis.

The student will develop a detailed progress plan at the beginning of the project, in consultation with their UNIS and home-institution supervisors, outlining the timeframe of the project, key milestones and deliverables, and budget.

Student background and requirements:
The applicant should have a strong background or potential in GIS and statistics, an understanding of Quaternary relative sea level, database skills, and an interest/ability in independent fieldwork. Independent remote or Arctic fieldwork experience is highly valued. Previous experience in coastal or raised marine geomorphology/sedimentology, UAV flying and digital photogrammetry, DEM modelling, and SfM, as well as programming in Python are all considered assets.

Funding:
Success of this project is dependent on the student securing sufficient funding to cover field logistics costs. Students are strongly encouraged to secure funding from their home institution and to apply for the Arctic Field Grant (max. 100 000 NOK, deadline November 15th 2023) and/or the Svalbards Miljøverfond grant (deadline February 1st and September 15th) to support their project. Students must already be registered in a masters programme at their home institution or at UNIS in order to apply for these funds.

https://www.forskningsradet.no/en/svalbard-science-forum/ssf-tools-and-funding-schemes/arctic-field-grant-afg/

https://www.miljovernfondet.no/

Application:
Agreement with your home university and with your UNIS supervisor and the Department of Arctic Geology is a requirement before you can apply for a guest master position at UNIS.

You must be enrolled in a masters-program at an approved higher educational institution in Norway or abroad. Your master-project should be within UNIS's research themes, and you should plan to stay at UNIS for a minimum of 3 months continuously.

There are four application deadlines per year for a guest masters at UNIS:

- 1 March
- 1 June
- 1 September
- 1 December

Earliest arrival at UNIS is 1.5 months after the application deadline.

More details of the application process, including application forms, can be found at https://www.unis.no/studies/guest-student-opportunity/

Please contact Dr Mark Furze (markf@unis.no) for more information.

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