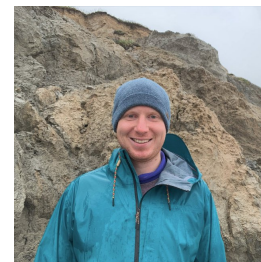


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## Short presentation

My research is focused on Coastal Cliff Erosion in Denmark and Greenland. Globally rising temperatures alter coastal erosion processes and rates with increasing velocities in the last decades.

The aim of my PhD project is to i) identify specific sites prone to cliff erosion processes along the coast of Denmark and Greenland, ii) investigate the rate of change at the respective sites in the last decades, iii) reveal the main drivers affecting coastal stability and iv) determine future changes of coastal cliff erosion under changing climatic conditions. To achieve this, satellite-based remote sensing data is used to observe geomorphological erosion patterns and to calculate rates of erosion and deposition. Further, data from measurements during (and between) two planned field trips is analyzed. Based on these in situ and remote sensing data, coastal erosion models are calibrated and evaluated and future cliff erosion rates under global change scenarios are modelled.

The results of this project will enhance our understanding of future changes at the coasts of Denmark and Greenland, providing valuable data to further investigate coastal erosion impact on land and ocean. Considering on-site effects, the acquired data will be essential for the population of Denmark and Greenland to manage and conserve their shorelines, to protect villages close to the coast. From a broader perspective, assessing the sediment eroded by coastal erosion processes is crucial to estimate an overall sediment yield for Denmark and Greenland in combination with fine-grained sediment from glacial erosion, as the exact impact of terrestrial sediment loss and input into the marine ecosystem is not well understood and might have feedbacks for global biogeochemical cycles.

## Employment

### Enrolled PhD student

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### Guest Researcher

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1 Oct 2022 → 30 Apr 2024

## Research outputs

### Evidence of Middle Holocene landslide-generated tsunamis recorded in lake sediments from Saqqaq, West Greenland

Korsgaard, N. J., Svennevig, K., Søndergaard, A. S., Lützenburg, Gregor, Oksman, M. & Larsen, Nicolaj Krog, 2024, In: Natural Hazards and Earth System Sciences. 24, 3, p. 757–772

### **Greenland-wide accelerated retreat of peripheral glaciers in the twenty-first century**

Larocca, L. J., Twining-Ward, M., Axford, Y., Schweinsberg, A. D., Larsen, S. H., Westergaard-Nielsen, Andreas, Lützenburg, Gregor, Briner, J. P., Kjeldsen, Kristian Kjellerup & Bjørk, Anders Anker, 2023, In: Nature climate change. 13, p. 1324-1328

### **Legally protect marine food web's lower echelons**

Bürkert, Johanna Sophie, Catonini, Federica, Bittner, Meriel Jennifer, Moedt, Sanne Mariël & Lützenburg, Gregor, 2023, In: Nature. 614, p. 624

### **Sedimentary Coastal Cliff Dynamics in Denmark and Greenland**

Lützenburg, Gregor, 2023, Department of Geosciences and Natural Resource Management, Faculty of Science, University of Copenhagen. 149 p.

### **Sedimentary Coastal Cliff Erosion in Greenland**

Lützenburg, Gregor, Townsend, D., Svennevig, K., Bendixen, M., Bjørk, Anders Anker, Eidam, E. F. & Kroon, Aart, 2023, In: Journal of Geophysical Research: Earth Surface. 128, 4, 17 p., e2022JF007026.

### **Cliff falls: using a smartphone to track erosion**

Lützenburg, Gregor, 28 Apr 2022, In: Nature. 604, 794, p. 794

### **Arctic Coastal Bluff Erosion on Disko Island, Greenland**

Lützenburg, Gregor, Townsend, D., Svennevig, K., Bendixen, M., Bjørk, Anders Anker, Eidam, E. F. & Kroon, Aart, 27 Mar 2022. 1 p.

### **A national landslide inventory for Denmark**

Lützenburg, Gregor, Svennevig, K., Bjørk, Anders Anker, Keiding, M. & Kroon, Aart, 2022, In: Earth System Science Data. 14, 7, p. 3157-3165 9 p.

### **Investigating coastal change with smartphone LiDAR**

Lützenburg, Gregor, 2022, In: Nature Reviews Earth & Environment. 3, 2, 104 p.

### **Evaluation of the Apple iPhone 12 Pro LiDAR for an Application in Geosciences**

Lützenburg, Gregor, Kroon, Aart & Bjørk, Anders Anker, 15 Nov 2021, In: Scientific Reports. 11, 9 p., 22221.

### **Climate and land use change effects on soil erosion in two small agricultural catchment systems Fugnitz - Austria, Can Revull - Spain**

Lützenburg, Gregor, Bittner, Meriel Jennifer, Calsamiglia, A., Renschler, C. S., Estrany, J. & Poepl, R., 2020, In: Science of the Total Environment. 704, 135389.

### **Preliminary landslide mapping in Denmark indicates an underestimated geohazard**

Svennevig, K., Lützenburg, Gregor, Keiding, M. K. & Schack Pedersen, S. A., 2020, In: Geological Survey of Denmark and Greenland (GEUS) Bulletin. 44, 6 p.