



ICG2022-697, updated on 29 May 2023

<https://doi.org/10.5194/icg2022-697>

10th International Conference on Geomorphology

© Author(s) 2023. This work is distributed under the Creative Commons Attribution 4.0 License.



Major deglaciation of Young Sound-Tyrolerfjord (NE Greenland) during the Early Holocene

Marc Oliva¹, Julia Garcia-Oteyza¹, David Palacios², José María Fernández -Fernández², Nuria de Andrés², Dermot Antoniades³, Vincent Jomelli⁴, and Irene Schimmelpfennig⁴

¹Department of Geography, Universitat de Barcelona, Catalonia, Spain

²Department of Geography, Universidad Complutense de Madrid, Madrid, Spain

³Department of Geography & Centre for Northern Studies, Université Laval, Quebec, Canada

⁴Aix-Marseille Université, CNRS, IRD, INRAE, Coll. France, UM 34 CEREGE, Aix-en-Provence, France

Current scientific knowledge of the deglacial history of Greenland is still spatially and temporally disperse, with a lack of data from several regions and time periods, as is the case for NE Greenland. A better understanding of the sensitivity of polar ice sheets to rapidly changing past climates is of key importance in the current climate scenario, where recent warming has affected the stability of ice sheets and thus accelerated global sea level rise. Here, we present new evidence of the glacial history of the 90-km long Young Sound-Tyrolerfjord system (NE Greenland) based on 78 ¹⁰Be Cosmic-Ray Exposure (CRE) ages obtained from moraine boulders, polished surfaces and erratic boulders distributed across three tributary valleys (Zackenbergl, Dolomit, Olsen) and at the head of the fjord (Tyrolerdal). The major deglaciation of the fjord occurred during Termination-1 (19-11 ka). At 13-14 ka, a period of major glacial shrinking was recorded, exposing also the highest surfaces of the region. No clear signal is detected in the area during the cold Younger Dryas phase. During the Early Holocene, glacial retreat accelerated, the lateral tributary glaciers receded and disconnected from the main glacier until the deglaciation of the fjord was completed by 10-11 ka. Since then, postglacial environmental (paraglacial, periglacial, slope, alluvial) dynamics have only slightly reshaped the landscape as Middle-Late Holocene climatic oscillations have not favoured large advances or retreats of the glacier fronts.