



Slow deglaciation of north Spitsbergen fjords

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Outlet glaciers draining ice sheets are systems with complex internal dynamics and velocity variations, and their responses to climate change are still not fully understood so that it remains difficult to predict future responses of ice sheets to climate change and sea-level rise. However, increased knowledge of the behavior of outlet glaciers draining past ice sheets may provide a valuable tool to improve our predictive ability. In our study, we performed ^{10}Be analyses of erratic boulders and bedrock from different elevations along a 70 km long transect in the Austfjorden/Wijdefjorden fjord system, the largest fjord system on northern Svalbard that acted as pathway for an ice stream draining the last Svalbard Barents Sea Ice Sheet (SBSIS) towards the Arctic Ocean. Our data suggest a relatively slow fjord deglaciation lasting between 23 and 11 ka which is in contrast to the much more rapid deglaciation of fjords recently documented elsewhere at the transition of the Late Weichelian and Holocene. The ^{10}Be results also provide new constrain on ice sheet thickness in this part of the SBSIS. Integration with swath-bathymetry data suggests that this slow deglaciation of the study area was most probably controlled by the generally shallow water depths in the fjord, limiting calving-induced rapid ice retreat.