



Subglacial hydraulic conditions of the former Barents Sea Ice Sheet inferred from meltwater landforms

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A large multibeam dataset acquired by the MAREANO programme covering over 24,000 km² at 5 m horizontal resolution has uncovered abundant subglacial meltwater landforms in the central Barents Sea. These landforms provide unprecedented insights into the nature of hydrological systems operating at the bed of the former Barents Sea Ice Sheet, helping us to understand the subglacial environments of marine based ice sheets as a whole. Large sinuous features up to 3.5 km wide and over 40 km long, with depths up to 40 m are interpreted as braided tunnel valleys, which would have drained vast amounts of water at the base of the ice sheet. Dendritic channels are also common, up to 42 km long and 24 m deep, along with several anastomosing channels and numerous complex esker systems. These features document that a wide range of subglacial hydraulic conditions and a well-established meltwater system existed beneath the former Barents Sea Ice Sheet. In conjunction with mapping of glacial landforms, these meltwater features provide the basis for a reconstruction of the subglacial drainage systems in the central Barents Sea and their interaction with the dynamic activity of the overlying ice sheet.