



## **Evidence for subglacial water beneath the palaeo-ice sheet in the northern Barents Sea, east of Svalbard**

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Marine-geological and geophysical data collected from the Kvitøya Trough, east of Svalbard, reveal an extensive palaeo-subglacial drainage system controlled by bedrock topography and geology. Significant amounts of meltwater existed at the base of the former ice sheet in the trough and in some areas further south. Subglacial drainage is characterised by descriptions of glacial landforms imaged on the seafloor and sedimentary deposits collected in gravity cores. Bedrock geology is characterised using swath-bathymetric and sub-bottom profiler data. The subglacial drainage system in the Kvitøya Trough comprises smaller, anastomosing to branching channels and larger cavities incised into impermeable bedrock. The smaller channels are oriented sub-parallel to ice flow and are often interconnected with each other and the larger cavities. Cavities form on the up-ice sides of highs in the underlying bedrock suggesting that subglacial water pooled on the up-ice side of topographic obstacles and eroded the cavities. To the south and north of the meltwater system, sedimentary substrates are found at the seafloor; no evidence for flowing meltwater exists on sedimentary substrates. However, in one area further south meltwater channels incised into bedrock are mapped terminating at the boundary with sedimentary substrates implying that here subglacial water was incorporated into the sediments and contributed to a deformable bed. The occurrence of subglacial meltwater beneath ice in the Kvitøya Trough is not interpreted to be coincident with the presence of a fast-flowing ice stream in the trough, although this is probably a function of limited inland ice supply and bedrock geology.