

Sequential development of Jutulhogget canyon, southern Norway

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Jökulhlaups or glacial lake outburst floods (GLOFs) are recurrent phenomena in glacial areas. They are often related to periods of deglaciation or retreating glaciers when there is an excess of glacial meltwater. The largest water floods on Earth are assumed to be related to the drainage of the enormous glacier dammed lakes which formed in front of the continental ice sheets in North-America and northern Eurasia during the glaciations. Jutulhogget canyon in southern Norway is one of northern Europe's largest canyons with a length of 2.4 km and a depth of 250 m. During glaciations, when the ice sheet divide was situated south of the main watershed in southern Norway, large glacier dammed lakes formed in the upstream ends of the eastern valleys. Jutulhogget canyon was formed by cataclysmic floods during the emptying of glacial lake Nedre Glåmsjø.

A new survey of the erosional deposits at the mouth of the canyon shows terraces with ice-contact features, subaerial drainage channels and plunge pools at different elevations. We suggest that this indicate a sequential development of the canyon through at least four distinct jökulhlaup events. The timing of the events is not yet resolved, but OSL dating of fine sediments suggest that Nedre Glåmsjø also existed during MIS3 prior to the last glacial maximum, and that the canyon formed between c. 30 and 10 ka.