

The Skessugarður bouldery end moraine, east Iceland: preliminary results on clast shape and moraine formation

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The Skessugarður end moraine is located in the highlands of eastern Iceland in the middle of a palaeo-ice stream flow-set extending from the interior highlands north of the present Vatnajökull ice cap in the southwest towards the coast in Vopnafjörður in the northeast. The moraine is situated on a streamlined bedrock hill and is around 7-m high and 10-m wide with a slightly steeper up-ice slope. The moraine is unique in that it consists almost entirely of boulders. Boulders are abundant on the bedrock hill, though seemingly less inside the moraine. The aim of this study was to examine clast morphology within the moraine in order to shed light on its formation and glacial processes operating during the deglaciation of the Iceland Ice Sheet. The clast morphological analysis involved measuring the a-, b-, and c-axis of boulders within as well as inside and outside Skessugarður both in the field and, for comparison, on a high-resolution DEM built from drone images. The purpose of the comparison was to explore the usability of high-resolution DEMs for clast morphological analyses. The comparison indicated that the high-resolution DEM can be used for analysing the morphology of stacked boulders that are well exposed within the moraine. In contrast, this method shall be used with caution where boulders are partly buried inside and outside the moraine.

A preliminary hypothesis involves initial creation of boulders through hydraulic jacking from the bedrock, subsequent glacial ripping of the loose clasts and downglacier transport, and finally deposition at the ice margin. More data on clast morphology, regional boulder distribution, and bedrock characteristics is needed to test this hypothesis.