



Slope dynamics in relationship to climate changes and human occupation since 1800 in Northeastern Iceland

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In this study, we characterized slope deposits and landforms and documented periods of slope activity. We also examined the relationship between slope dynamics and the occupation and abandonment of three farms (Norður Hús, Flautafell and Stekkur) in Þistilfjörður, northeastern Iceland. Despite moderate elevations, the mountainous areas of this region present extensive slope activity. This is due in part to the barren landscape, highly variable meteorological conditions, and significant sediment availability. The slopes of Flautafell Mountain extend down a highly-jointed basaltic 30 m rockwall. The frost shattering of the rockwall creates debris at the top of the slope that is remobilized by snow avalanches and debris flows.

The sedimentary and stratigraphical records of colluvial deposits show alternating periods of coarse deposits (originating from slope activity) and fine deposits (originating from aeolian processes). We used radiocarbon dating (^{14}C) and tephrochronology to date these periods. Slope instability occurred at around 7600 cal. yr BP, 3500 cal. yr BP, AD 1300 and AD 1477. Slope activity is thought to reflect extreme meteorological episodes that occurred throughout the Holocene. Our data also revealed increased snow avalanche and debris flow activity during the Little Ice Age. This period of activity was preceded by a period of relative stability beginning ca. 3000 cal yr. BP. We also observed a decrease in the extent of debris transported by modern processes. Despite limited human occupation at the foot of the slope, avalanche and debris flows most likely played a role in farm abandonment and we were able to link avalanche events in the archives with geomorphological evidence in the field. For example, the destruction of some parts of the homefield at Flautafell farm reveals slope activity, which may also be related (at least indirectly) to the abandonment of the farm at Norður Hús sometime before A.D. 1300. The auxiliary farm installations at Stekkur remained untouched by slope processes even though they are in a vulnerable area. The data could be used in further archeological investigations and it increases our knowledge of subarctic slope dynamics in an area that had not been previously studied.