

Frequency, triggering factors and possible consequences of mass movements on outlet glaciers in Iceland.

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During the last 15 years several mass movements of various size and origin, e.g. rock avalanches, rock slides and debris slides have been observed to have fall on outlet glaciers in Iceland. This should not come as a surprise in this type of glacial environment, but in a way it does. When looking at the history only few mass movements are recorded to have fall on outlet glaciers in Iceland, during the decades before the year 2000 or since 1960. This “lack of mass movements” can be explained by the fact that fewer observations and monitoring were done in the past, but is it so or are we seeing increasing activity? Looking at the distribution of the known mass movements, two activity periods can be identified. The former one around 1970 and the second one starting around 2000 and is still ongoing. Both of these periods are characterized by warmer climate leading to retreating phases of glaciers. Two larger mass movements are known from these two retreating periods. The former one occurred in January 1967. Then a large rockslide fell on the snout and into the glacial lake of the Steinholt sjökull outlet glacier in the northern side of the Eyjafjallajökull ice cap. The rockslide broke up the snout of the glacier and caused large floodwave bursting down the Steinholt sdalur valley transporting large volume of sediments down its path. The later one occurred in 2007, when a large rockavalanche fell on the Morsárjökull outlet glacier, in the southern side of the Vatnajökull ice cap. The avalanche debris covered around 1/5 of the glacier surface.

Today the retreat and thinning of glaciers in Iceland are extremely rapid. The consequences of such a rapid retreat are e.g. unstable valley slopes surrounding the outlet glaciers, both in loose sediments and bedrock, thawing of mountain permafrost and not least formation of glacial lakes in front of the rapid retreating ice margins.

Such conditions can become extremely hazardous, as seen by the above mentioned examples, both for all infrastructure but not least for the rapidly increasing tourism in Iceland.