Towards a consistent morphometric characterization of lacustrine landslides

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Subaquatic landslides are common worldwide in both marine and lacustrine environments and pose a potential hazard to offshore infrastructure and coastal communities. Despite their importance, the knowledge of subaquatic landslides has been hampered due to their hard-to-reach nature; thus, many key scientific questions remain unanswered. Lacustrine settings are typically easier to access, survey and sample than deep marine sites; hence, in recent years, several detailed case studies of lacustrine landslides have provided important advances in our knowledge. It is unclear, however, how many of those findings are more generally applicable to subaqueous landslides at much larger scales and in other settings. Terrestrial landslide studies have demonstrated the value of global inventories in detecting and quantifying broader trends between settings and across a wide range of scales, but to date, no equivalent inventory exists for subaqueous landslides. One reason for this is due to inconsistencies between how landslides are described and measured in the different subaqueous settings in which they occur.

We aim to build an inventory to enable quantitative and consistent comparative analysis between landslides that first focuses on lacustrine settings. Our study has an ultimate goal of comparing key attributes with landslides found in the full range of subaqueous environments. One key question to address is whether any morphometric measurements of lacustrine landslides can be scaled up to the much larger scales typically observed in marine settings? A comparison between the lacustrine and the marine landslides inventory may help to answer this question and define if lakes could be considered as small scale model of marine environment. Here we first define a set of parameters (primarily morphometric) that will be used to consistently characterize lacustrine landslides in our inventory. We will follow the approach outlined by Clare et al. (This Volume) and discuss the benefits and challenges of adopting this approach for lacustrine landslides. Through the use of illustrated case studies from end-member test sites we will present a best practice approach for the characterization of lacustrine landslides, thus forming the basis for a broader comparison with marine equivalents in future.