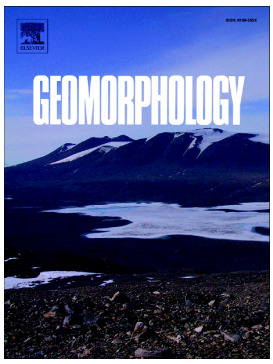

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River-damming, late-Quaternary rockslides in the Ötz Valley region (Tyrol, Austria)

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Keywords: rockslide dam, landslide dam, rock avalanche, geomorphic index, stability, dam formation and failure

Abstract

The Ötz Valley and adjacent regions in Tyrol (Austria) have been repeatedly affected by large rockslope failures following deglaciation. Six rockslides, each over 10^7 m^3 in volume, were emplaced into the Ötz and Inn valleys, five of which formed persistent rockslide dams. Even though catastrophic rockslope failures are short-lived events (commonly minutes) they can have long-lasting impacts on the landscape. For example, large fans have built in the Ötz Valley and knickpoints persist at the former dam sites even though the Ötz River has eroded through the deposits during the past thousands of years; exact age-constraints of rockslide dam failure, however, are still scarce. Empirical, geomorphic stability indices from the literature successfully identified the least and the most stable dams of this group, whereas the rest remain inconclusive with some indices variably placing the dams in the stable, unstable, and uncertain categories. This shows (a) that further index calibrations and (b) better age constraints on dam formation and failure are needed, and (c) that the exact processes of dam failure are not always trivial to pinpoint for ancient (partially) breached