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Implications of the rapid disappearance of Glacier du Sex Rouge (western Swiss Alps) for local multi-hazard and risk assessment at Les Diablerets

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This case study presents preliminary results of an in-depth application of state-of-the-art multi-hazard and risk assessment strategies (see e.g. Schaub 2015) to identify and assess present and future impacts, vulnerabilities and risks related to the currently observed rapid changes of the high-mountain cryosphere in the catchment of Glacier du Sex Rouge.

Glacier du Sex Rouge, a very small and rapidly shrinking glacier in the western Swiss Alps, is projected to completely disappear around 2030. The current glacier bed topography has been investigated based on close meshed ground penetrating radar (GPR) surveys and shows a trough-shaped structure, i.e. an overdeepening confined to all sides formed by past glacier erosion. Evidence for the potential formation of a future new lake can already be observed at the location of today's glacier terminus during summer.

The possible lake formation might change the hazard and risk potential for population and infrastructure in the area of Les Diablerets (1162 m a.s.l., a village situated 6 km from Glacier du Sex Rouge) or even further down-valley. Impact waves triggered due to rock fall from the steep northwest face of Oldehore/Becca d'Audon (3123 m a.s.l.) with occurring permafrost could potentially overtop the lake's rock dam and initiate a flood wave which might – considering the notable amount of loose debris currently accumulated in the forefield of Glacier du Sex Rouge – develop into a debris-flow by sediment entrainment along its flow path.