

Evolution of hut access facing glacier shrinkage in the Mer de Glace basin (Mont Blanc massif, France)

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Given the evolution of high mountain environment due to global warming, mountaineering routes and huts accesses are more and more strongly affected by glacial shrinkage and concomitant gravity processes, but almost no studies have been conducted on this relationship. The aim of this research is to describe and explain the evolution over the last century of the access to the five alpine huts around the Mer de Glace glacier (Mont Blanc massif), the larger French glacier (length = 11.5 km, area = 30 km²), a major place for Alpine tourism since 1741 and the birthplace of mountaineering, by using several methods (comparing photographs, surveying, collecting historical documents).

While most of the 20th century shows no marked changes, loss of ice thickness and associated erosion of lateral moraines generate numerous and significant changes since the 1990s. Boulder falls, rockfalls and landslides are the main geomorphological processes that affect the access, while the glacier surface lowering makes access much longer and more unstable. The danger is then greatly increased and the access must be relocated and/or equipped more and more frequently (e.g. a total of 520 m of ladders has been added). This questions the future accessibility to the huts, jeopardizing an important part of mountaineering and its linked economy in the Mer de Glace area.