



Assessing the value of information in climber's guidebooks to derive spatio-temporal rockfall patterns

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Rockfall rates in mountain ranges are expensive to measure over large spatial scales, mainly due to the inaccessibility of mountainous terrain. Existing methods to measure rockfall include acoustic methods (listening to the rock's impact or creation by frost weathering), spectral methods (looking at the colour of mountain faces to determine their freshness and by extension the time since last rockfall) and volumetric methods (measuring the volume that fell). These methods, especially in combination, have allowed researchers to quantitatively derive rates (and distribution of rates over time) of rockfall for several well studied locations.

However, the small spatial support of these methods means that results are only valid for small well-studied locations. This is a problem when we want to derive baseline information on rockfall rates over entire mountain chains and ranges – which is important to study their temporal distribution and their relation with climate change. This contribution explores the potential of information contained in climber's guidebooks to derive qualitative rockfall rates with large spatial and temporal coverage.

Climber's guidebooks have been published since the early 1900's, giving prospective mountaineers strongly codified information about routes and conditions expected along the way. The information about the looseness of rocks, which is clearly important for climbers from a safety perspective, may also be useful to link to rockfall rates. I have used a series of guidebooks published at irregular intervals for the Bernese Oberland in Switzerland to study the change in descriptions of looseness of rocks for a number of famous climbing routes. These routes were selected because of the opportunity to complement information in guidebooks with other (visual and written) sources of information.

Results indicate that descriptions of looseness of rock can be used to derive a qualitative pattern of rockfall, especially over larger spatial scales. The value of the information is also valuable as a link to temporal changes in rockfall rates, but this use is hampered by the fact that text is sometimes copied between successive guidebooks without a stringent reassessment of actual conditions on the route.