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Impacts of debris cover on glaciers: research priorities and relation to glacier-climate interactions on clean-ice glaciers.

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Debris covered glaciers are a common feature in many high mountain environments. The presence of surficial debris fundamentally alters a number of glacier processes, and consequently the manner in which glaciers respond to climate. Incomplete understanding of these altered processes hampers (a) the use of records of glacier change as a means of unraveling former climate conditions, (b) the production of glacier runoff projections and (c) development of high quality hazard assessments of the future development of debris covered glaciers and associated ice dammed lakes.

This presentation summarizes four key ways in which debris cover alters the behaviour of glaciers in ways that are relevant to solving both scientific and more practical problems:

(1) surface energy balance and sensitivity to climate
(2) ablation gradient of debris covered glaciers and their long profile evolution under changing climate conditions
(3) differential ablation and the development of supraglacial ponds
(4) sedimentary record of moraine deposition and impacts of this on climatic reconstruction and long term moraine stability

The presentation concludes by outlining priority list of research required specifically on debris covered glaciers and how this could be integrated within research programs assessing the response of clean ice glaciers to ongoing climate change.