

## Submitted Abstract

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<b>Title</b>	Investigating The Dynamic Behaviour Of Khumbu Glacier, Nepal, In Response To Recent And Projected Climate Change.
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## Abstract

Regional satellite observations of glacier mass change indicate that debris-covered glaciers are shrinking at similar rates to clean-ice glaciers across High Mountain Asia, and that the rate of glacier mass loss is accelerating. This greater-than-expected mass loss has been partly attributed to differential ablation processes that locally enhance mass loss within the debris-covered section of the glacier, for example at ice cliffs and supraglacial ponds, and to changes in ice flow as glaciers respond to climate change. For the last five years, we have measured the englacial properties of the high-elevation debris-covered Khumbu Glacier in the Everest region of Nepal and combined these data with observations of the geomorphological expression of longer-term glacier change through the Holocene and the Little Ice Age. Data collection has included observations of ice temperature from deep boreholes through the glacier, englacial debris distribution, supraglacial hydrology from dye tracing, sub-debris melt from measurements of supraglacial debris temperature, and the timing and rate of glacier mass change from terrestrial cosmogenic nuclide exposure-age dating of Holocene moraines built by Khumbu Glacier and the adjacent Lobuche Glacier. These data are used to constrain a numerical model of the evolution of Khumbu Glacier through the Late Holocene to the present day, with the aim of developing and testing models of the dynamic behaviour of high-elevation debris-covered glaciers and improving the parameterisation of their behaviour in projections of future regional and global glacier change.