

In-situ observations of the April 2014 Mount Everest Avalanche

Kent Moore (1), Paolo Cristofanelli (2), Paolo Bonasoni (2), Gian Pietro Verza (3), and John Semple (1)

(1) University of Toronto, Toronto, Canada, (2) National Research Council of Italy, Bologna, Italy, (3) Ev-K2-CNR, Bergamo, Italy

Instrumental records indicate a warming of approximately 0.80C has occurred in the Everest region since the 1980s that has resulted in a 100-300m rise in the height at which the ground is permanently frozen as well as a retreat and thinning of Everest's glaciers. This period of warming has coincided with Mount Everest becoming an increasingly important destination for both climbers and trekkers. For some time, there have been concerns that this warming and the resultant changes in the region's glaciers may be increasing the risks for both travellers to Mount Everest as well as the indigenous populations who support them. On April 18 2014, an avalanche caused by the collapse of a large serac swept down Mount Everest's Khumbu Ice Fall resulting in the deaths of 16 Sherpa. Although satellite imagery has been used to estimate the size of the serac, in-situ data on the avalanche itself has not been available. Here we show that this event was of a sufficient size as to result in the excitation of a 20 min long 'avalanche wind' that was observed at the Nepal Climate Observatory-Pyramid situated 12 km from Mount Everest. We use these observations to estimate that the winds at Everest Base Camp during this event were of hurricane strength. As a result of the destabilization of the region's glaciers due to the climate change, there are concerns that such events may become more frequent. These results provide the basis for a method to estimate the frequency and severity of avalanches in this region.