

## **Characterizing wet slab and glide slab avalanche occurrence along the Going-to-the-Sun Road, Glacier National Park, Montana, USA.**

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Wet slab and glide slab snow avalanches are dangerous and yet can be particularly difficult to predict. Both wet slab and glide slab avalanches are thought to depend upon free water moving through the snowpack but are driven by different processes. In Glacier National Park, Montana, both types of avalanches can occur in the same year and affect the Going-to-the-Sun Road (GTSR).

Both wet slab and glide slab avalanches along the GTSR from 2003-2010 are investigated. Meteorological data from two high-elevation weather stations and one SNOTEL site are used in conjunction with an avalanche database and snowpit profiles. These data were used to characterize years when only glide slab avalanches occurred and those years when both glide slab and wet slab avalanches occurred.

Results of 168 glide slab and 57 wet slab avalanches along the GTSR suggest both types of avalanche occurrence depend on sustained warming periods with intense solar radiation (or rain on snow) to produce free water in the snowpack. Differences in temperature and net radiation metrics between wet slab and glide slab avalanches emerge as one moves from one day to seven days prior to avalanche occurrence. On average, a more rapid warming precedes wet slab avalanche occurrence. Glide slab and wet slab avalanches require a similar amount of net radiation. Wet slab avalanches do not occur every year, while glide slab avalanches occur annually. These results aim to enhance understanding of the required meteorological conditions for wet slab and glide slab avalanches and aid in improved wet snow avalanche forecasting.