

Avalanche ecology and large magnitude avalanche events – Glacier National Park, Montana, USA

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Large magnitude snow avalanches play an important role ecologically in terms of wildlife habitat, vegetation diversity, and sediment transport within a watershed. Ecological effects from these infrequent avalanches can last for decades. Understanding the frequency of such large magnitude avalanches is also critical to avalanche forecasting for the Going-to-the-Sun Road (GTSR).

In January 2009, a large magnitude avalanche cycle occurred in and around Glacier National Park, Montana. The study site is the Little Granite avalanche path located along the GTSR. The study is designed to quantify change in vegetative cover immediately after a large magnitude event and document ecological response over a multi-year period. GPS field mapping was completed to determine the redefined perimeter of the avalanche path. Vegetation was inventoried using modified U.S. Forest Service Forest Inventory and Analysis plots, cross sections were taken from over 100 dead trees throughout the avalanche path, and an avalanche chronology was developed.

Initial results indicate that the perimeter of this path was expanded by 30%. The avalanche travelled approximately 1200 vertical meters and 3 linear kilometers. Stands of large conifers as old as 150 years were decimated by the avalanche, causing a shift in dominant vegetation types in many parts of the avalanche path. Woody debris is a major ground cover up to 3 m in depth on lower portions of the avalanche path and will likely affect tree regrowth. Monitoring and measuring the post-avalanche vegetation recovery of this particular avalanche path provides a unique dataset for determining the ecological role of avalanches in mountain landscapes.