

Using raw LiDAR (Light Distancing And Ranging) data to identify trimlines in large avalanche paths

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Raw LiDAR data was used to remotely sense trimline locations in large avalanche paths by determining the height of the young trees within the slidepaths. LiDAR is a remote sensing technique using the time lag of reflected laser pulses to determine the distance between a target and a source. These pulses reflect off any surface, including trees.

This study uses Fusion to analyze the raw LiDAR data. Fusion is a very powerful software package created by Robert J. McGaughey at the USDA Forest Service's Pacific Northwest Research Station. In addition to viewing the raw pulse data, this software allows users to analyze the quality of the raw LiDAR data, produce bare earth DEMs (Digital Elevation Models), create canopy surface and density models, calculate descriptive statistics, and convert data to other formats. Highly detailed, bare earth DEMs are one of the most common products of LiDAR data.

In the summer of 2008, a LiDAR mission was flown for the southern Teton Range in western Wyoming, USA. This area contains many large avalanche paths. Fusion was used to create canopy height models from the raw LiDAR pulse data, and to convert these models into a format that could be analyzed in a Geographic Information System (GIS). In many large avalanche paths, multiple trimlines could be identified as new trees grow up after complete removal by historic avalanches, creating different age class stands corresponding to large historic avalanche cycles.