AVAILANCHE DANGER PREDICTION PROJECT

The purpose of our project will be to ascertain effectiveness of weather datasets in avalanche prediction, namely in determining avalanche prone areas. This will be done using datasets from the Snotel network as well as data available through the Colorado Avalanche Information Center (CAIC), the National Snow and Ice Data Center (NSIDC) in Boulder, CO, and any other data that can be groomed and supplied by Mr. Gregory Hill of the Inventory and Monitoring Program for the National Parks Service. There is also an Avalanche Workshop at Copper Mountain on October 10th, 2007 that may provide useful info. With an increase in backcountry skiing and recreational activities during the winter months, outdoor enthusiasts need to be aware of the dangers that can present themselves. Data will be limited to slab avalanches.

According to the NSIDC, the main factors at play in an avalanche are temperature, slope steepness, slope orientation (the direction the slope faces), wind and ground cover. Data from the NSIDC that can be utilized is their EASE-Grid Weekly Snow Cover. (http://nsidc.org/data/easytouse.html) In order to ensure a quality amount of data, we wanted to study an area that has had avalanches in the past. Our plan is to continue researching and choose to look at either of the two major epicenters of avalanches near Aspen and NE of Breckenridge shown on the attached map (Mapquest). Our tentative plan is to study the Front Range area NE of Breckenridge, as it has the most avalanches corresponding to Snotel measurement sites. Focus will only be on the most data enriched ridge or sq. mile of land we can find.

Mr. Hill was quite interested in our idea for modeling and testing avalanches; he was most intrigued by our idea to predict avalanches for an area and then to test this prediction against past year occurrences. While we both agreed that algorithmic prediction of nature’s wrath are far beyond the semester long timetable for this class, website overviews of the Avalance model prediction (http://www.linuxjournal.com/article/2710) include three variables that we can obtain and query in ArcGIS 9.2 to create our own simplified model. For example, it is well known that avalanches occur on slopes between 30-60 degrees. Those variables are mountain slope and pitch, water equivalent of the present snowfall, and the current temperature. http://www.avalanchemapping.org/gisserv.htm is an active avalanche mapping site that has developed a new data model for avalanche prediction, unveiled in Jackson Hole at the 2004 International Snow Science Workshop. Mr. Hill was quite convinced that a simplified prediction sequence would still be useful for this project, utilizing no more than three variables (slope/orientation, snow/water equivalent, temperature). Avalanche danger will be conveyed to the public through the graphic representation known as avalanche roses as well as 3D DEMs of the mountain range analyzed, with a chromatic differentiated scheme for displaying danger levels.

Can you do these?
Works Cited

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Avalanche Path Prediction