SLABS AND WEAK LAYERS

Stability Fluctuations within a Region

by Paul Baugher

Snow stability varies directly with time and space. This venerable forecasting truth is readily apparent when you observe that wind has loaded one side of a couloir and scoured the other. But when there is a persistent wide-spread weakness in the snowpack the stability evaluation becomes a lot more complex. Have you ever wondered why your Rutschblock will not fail on an obvious weak layer that your shovel shear finds? Have you ever heard reports of skier-triggered slides in other parts of the range and wondered what to make of it?

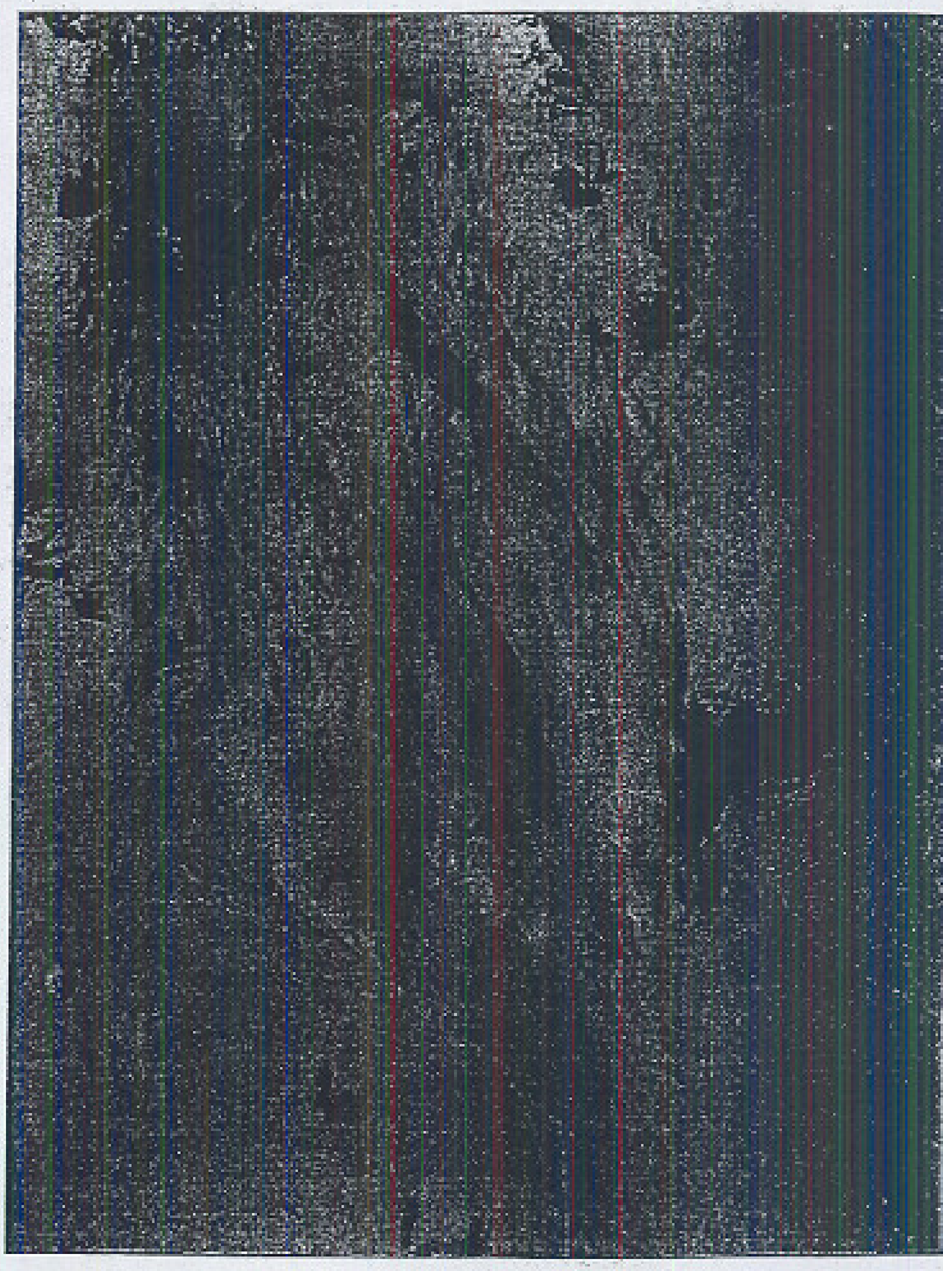
Understanding a few concepts about the interaction of slabs, weak layers, and skiers will help hone your forecasting skills. This topic could fill volumes so I think I'll bring out some of key forecasting elements in the context of a "No shit, there I was" ski trip from last February.

Two weeks had passed since the last significant storm and avalanche cycle, yet slab instability still persisted. During that period there had been several reports of skier-released slabs throughout the Cascade Range. The most recent incident involved a guide in the North Cascades making a ski cut. I was very interested in that information since I was starting three days of skiing in the backcountry of the North Cascades.

I dug a quick snow profile and found a potential weak layer thirty inches down. This was the snow surface from two weeks ago. The weather had been generally cold while this layer had been on the surface. During that period the sky was only occasionally clear. It is important to understand that during periods of cold weather, temperature changes at and near the snow surface often result in weak poorly bonded snow crystals. While these layers prolong powder skiing they can also prolong snowpack instability once buried.

The layer I found was a mixture of near surface faceted crystals and some surface hoar. As I looked at this two-week old layer through the lens I could see the angles of the relatively large grains beginning to round off and bonds had begun to develop.

I could easily put my fist into the thirty- inch thick soft slab layer above. Even though its stellar crystals had been breaking down and slowly bonding during the past two weeks it would still yield



great powder skiing. It was also clear that the snow pack was weak enough to allow skier-triggered avalanches.

On the first day of our trip we were attempting to produce avalanches for a film company. Initially my partner and I stuck to the ridges above steep starting zones. We were able to drop large cornices onto the slopes below. Since snow stability is relative to the force applied, several two-foot thick soft slab avalanches running about 2000 vertical feet were produced.

I skied down an adjacent slope to recover a pre-positioned camera. The slope angle was lower and the powder skiing was quite good. In this

miles away. I was able to ski cut several small ten-inch soft slabs on test slopes of up to 40°. What was the difference? The fracture revealed the same