

## THE 2015-16 SEASON SNOWPACK IS BAD

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Published January 15, 2016 in the Bozeman Daily Chronicle *Carve Magazine*

This winter's snowpack has been described in the avalanche advisories as bad, poor, weak, unstable, dangerous, and tricky. The reason is simple: the early snows in November transformed into sugary grains of angular facets that do not bond to each other and are exceptionally weak. These facets are the foundation of our snowpack. This foundation is weak, crumbly and poorly supports December's snowfall. As an avalanche forecaster I pay attention to the snow's water weight. More water weight equals more stress on the weak layer. If we melted all of December's snow it would measure 7-8" of water. That's a lot. A rule of thumb is 1" of snow water weight equals a foot of new snow which compresses down with the next storm falling on top of it. Lots of snow on a weak foundation creates avalanches, and the last two weeks of December saw many avalanches and several days of Avalanche Warnings and High danger.

This occurred because November's snow grew into weak facets from a combination of shallow snow and cold temperatures. This turned into depth hoar, an advanced and exceptionally weak stage of faceting that we haven't seen since 2010. The metamorphosis from a snowflake to depth hoar occurred in a matter of weeks, but reversing that process—turning depth hoar into strong, stable--snow can take months.

This season the depth hoar is exceptionally dangerous because it underlies our snowpack in every mountain range. When it avalanches it brings the entire winter's snow with it. The weakest of the weak already avalanched around Christmas, but there are many hills still close to avalanching. Like the straw that broke the camel's back, the weight of one person can be the trigger. Depth hoar will not feel the weight of a 200-pound skier standing on an eight foot deep snowpack--it's just too deep. But that same person on a two foot snowpack can easily impact that layer. Snow depth in the mountains is variable: it might be eight feet deep in the center of the slope and two feet on its edges. If a skier or snowmobiler hits a thinner spot, the depth hoar, which blankets the whole slope, will collapse and propagate a fracture up and across the entire hill. This is a common way that large and deep avalanches get triggered. It is also how people on flatter terrain at the bottom of a slope can trigger an avalanche far above them. A snowmobiler died outside Cooke City on December 19 when an avalanche was triggered this way.

Our daily avalanche advisories give warnings on the likelihood of triggering avalanches. This season large snowstorms will create especially dangerous hair-trigger conditions for avalanches. During times of high instability Mother Nature gives us clear warnings that are hard to miss: avalanches occurring on their own, cracks shooting out like lightning bolts from our skis or sleds, and collapses or audible "whumphs" as we travel. These indicate that slopes are unstable and teetering on avalanching. The signs of instability are obvious and welcome; they keep us alive but once they are gone decision-making gets tricky. Slopes may "feel" stable when they are not. A sunny day, thousands of feet of powder, tracks on the slope, no recent avalanches, a feeling of being on top of the world and in control tell your brain "Go for it. It's fine." Maybe, maybe not. Avalanches involving depth hoar are deep and usually deadly.

Our entry level of risk is higher than past years. We cannot be sloppy. The snowpack structure is poor and deep slab avalanches involving depth hoar are difficult to predict. Thus we preach and practice conservative decision-making and travel habits because the consequences of an avalanche are dire. Skilled and knowledgeable people die in them. This season may be one in which the big lines and steep slopes of your dreams remain as dreams. This doesn't mean you should not go out, but does mean you must be extra vigilant about avalanche danger.

When there are no signs of instability and a decision has been made that it's safe to enter avalanche terrain, stop, find out what's under your feet, dig and test.

**Stop** on a slope that's similar to the one you want to ride. It does not have to be steep, flats will do.

**Dig** to the weak layer, in this case the ground. Try to find one of the thinner spots resembling a trigger point.

**Test** the snow using an Extended Column Test. A shovel, probe pole and six foot piece of string is all you need. If you don't know how to dig one, go to [mtavalanche.com/stability](http://mtavalanche.com/stability) tests and learn how. It's easy. If the column propagates a fracture don't play on the slope. Stability tests only tell us when not to go. They do not give us a green light to go for it. I wish they did, but they don't.

Do not gamble with your life. Riding and skiing in avalanche terrain with depth hoar on days of High danger is like playing Russian Roulette with a fully loaded gun. Days of Moderate or Low danger is like playing Russian Roulette with only one bullet in the chamber. Wearing an air bag and beacon is sane, standard behavior, but their main function in deep slab avalanches is so rescuers can find your body and relatives don't have to wait until spring-melt to hold your funeral.