

Some Thoughts on Surface Hoar



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Lynne Wolfe, editor of TAR, asked me to jot a few thoughts down on how we manage surface hoar once it is buried. This is the email I sent back to her.

Lynne:

Southwest Montana is a surface hoar factory and without it Karl Birkeland at the National Avalanche Center wouldn't get any research done. Unfortunately, once formed we are forced to write about it in our advisories for weeks longer than we want to. And really, why is it called surface hoar once it's buried?

Enough drivel. Here are some of my thoughts on these small ferns of death:

- As soon as surface hoar gets buried I begin to worry. Most of the time it's initially buried by powder but I have seen fist hardness slabs avalanche, so I test it with an ECT.
- I pay careful attention to ECT scores to see if it's getting stronger over time. Last year, buried surface hoar produced regular ECTP scores for over a month, helping Ian Hoyer get his Master's Degree. This year a similar layer appeared but it quickly stopped propagating. Go figure.
- Surface hoar can be finicky about where it forms and one of the avalanche center's most time consuming jobs is finding out where it does and does not exist. Sometimes there's no rhyme or reason to its distribution.
- Feathers of surface hoar that are centimeters tall do not always create avalanches. Perhaps the snow capping the layer sifts in between the crystals and acts as a brace.
- Thin layers are scarier (<1cm) because they seem to hang in there longer than I think they should. I'm not sure why that is.
- I have seen avalanches break on surface hoar six weeks after burial. Time alone is not an indicator of stability; the snowpack needs to be tested.
- I cheer when inches of SWE quickly load this layer because it will usually avalanche spectacularly. The surface hoar's first time getting walloped always makes me hopeful to see some natural activity.
- With buried surface hoar, whumphing and human triggered avalanches are closely aligned, more than with other weak layers.
- As the slab above the layer increases in depth and weight, surface hoar can sometimes get more stable as the feathers get pushed into the slab above.
- Surface hoar is well known to avalanche in lower angled terrain and I treat it with utmost respect and a bit of fear. The only way to deal with it is to dig and test. There's no shortcut.
- In many cases surface hoar shows up as a stripe in the pit wall which takes the guess work out of its location. This helps me explain how and where to find it to the public, both in the advisories and in videos.
- As soon as surface hoar is buried you have at least 4 but sometimes all 5 of McCammon's lemons; bad

juju.

- Some people call a buried surface hoar problem a persistent slab or persistent deep slab while others focus on the lemons. For me the term “buried surface hoar” is all it takes to have me sit up straight and pay attention.

I hope this helps!

Doug