

2020-2021 Season Snowpack Summary
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May 3, 2021

All winter we talked about weak, sugary snow near the base of the snowpack creating unstable conditions, especially in the mountains near Bozeman, Big Sky and West Yellowstone. From late October through November the mountains received 2-4 feet of snow, followed by mostly dry and cold weather through mid-December. This long period of high pressure caused the early season snow to become faceted, sugary and weak.

From late December through mid-January, steady light snowfall accompanied by wind formed slabs on top of the weak snow at the ground. Signs of instability like collapsing and cracking were widespread. Avalanches 1-3' deep were triggered by skiers and riders and broke naturally. Activity peaked during and after an avalanche warning on January 5th, and more Human triggered and natural avalanches occurred through mid-January.

Although Cooke City had less avalanches break on weak facets near the ground compared to the rest of our area, on January 8th three skiers from a group of six triggered and were caught in a large avalanche on The Fin. Two were injured with one requiring helicopter evacuation.

Almost completely dry conditions during the second half of January gave the snowpack a break and there were less avalanches, but still propagating stability test scores and the occasional whumph, collapse or crack. The first few inches of snowfall at the end of January elevated the avalanche danger to Considerable and the snow at the ground was not shy in expressing its weakness. On January 30th skiers remotely triggered a very large avalanche in the southern Madison range, and widespread collapsing and unstable test scores continued throughout the advisory area.

A snowy, cold pattern the first week of February brought nearly continuous heavy snowfall. We issued an avalanche warning for the Bridger Range on Feb 5th and for most of the advisory area on Feb 7th, and natural and human triggered avalanches occurred everywhere. A brief dry period allowed danger to decrease to a spicy moderate as human triggered avalanches continued to break on the weak snow near the ground. Tragically, on February 14th a splitboarder was killed in one of these avalanches in Beehive Basin near Big Sky.

Heavy snow returned and we issued an avalanche warning for the mountains near Bozeman and Big sky on February 17th. Snowfall amounts and loading rates were less than storms earlier in February and we saw less avalanche activity as snowfall let up. Then strong winds drifted snow into thick slabs which tipped the scales of the weak snow near the ground. In Hyalite, natural avalanches broke 4-10' deep in the now average, deep late winter snowpack, and near Big Sky a snowmobiler triggered a 10' deep avalanche.

Snowfall continued at a slower, but steady rate through the end of February. Avalanches breaking on weak snow near the ground became infrequent. There were minimal signs of instability like collapsing, unstable stability tests or recent natural activity. On the final days of February, a snowmobiler triggered a 3-4 foot deep, relatively very large avalanche on the weak

snow near the ground in the southern Madison Range, and near Big Sky skiers that were filming and hitting a jump triggered an avalanche on the slope where they were landing. It broke 4-6' deep, 200' wide and sympathetically triggered another similar sized slide 300' away. Luckily, nobody was caught in either of these incidents.

In the first half of March there was almost no new snow and it became difficult to trigger monster avalanches breaking at the bottom of the snowpack. Warm and dry weather turned our concerns to wet avalanches, and caused weak layers to form on the snow surface. A week into March it became unlikely to trigger a deep slab avalanche and danger was low until more snow fell. Snowfall became more frequent, but modest storm totals kept our primary concerns to avalanches breaking within the new snow and 1-2' deep on weak layers that formed in early March.

By the end of March, a week of storms totaling 2.5-3 feet of snow had us considering the return of avalanches breaking on sugary snow at the bottom of the snowpack. At the end of this week of snow a skier remotely triggered a 50' wide, 8-12' deep slab avalanche near Mt. Blackmore in Hyalite, and a natural 3-5' deep slab avalanche was reported near Flanders Mountain. Three days of strong wind followed this snow storm, with gusts of 60-100 mph. Danger rose to considerable and there were plenty of wind slab avalanches, but no more deep slabs were reported.

April began with above freezing temperatures and sunny skies, and our concerns shifted back to wet snow avalanches. Most nights had near freezing temperatures and clear skies which kept avalanche activity to shallow loose snow slides. Four days into April we heard of a few shallow wet slabs, and on slopes that receive more sun and warm temperatures the snowpack was wet all the way through. Light freezes for a few nights allowed the wet snowpack to barely hold together before cold, wind and snow returned on April 7th. On shady, high elevation slopes the snowpack stayed mostly dry.

Danger dropped to low on April 8th. After a few small storms and moderate winds, avalanche hazards were limited to small drifts and loose snow avalanches. We issued our final daily forecast on April 11th.

This was one of the worst years for stability with no time or space to step out carelessly. Until mid-March our only safe strategy was to avoid travel on and underneath slopes steeper than 30 degrees. The support from our local community and the forest service, with some luck of course, prevented many more accidents. Thank you for your patience and diligence with safe travel this season, for reading the forecast, taking classes, submitting observations, or donating money or time. Have a fun and safe spring and summer.