Backcountry Weekly Summary

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Week and Year	1/2/21-1/8/21
Backcountry zone:	Crested Butte Area

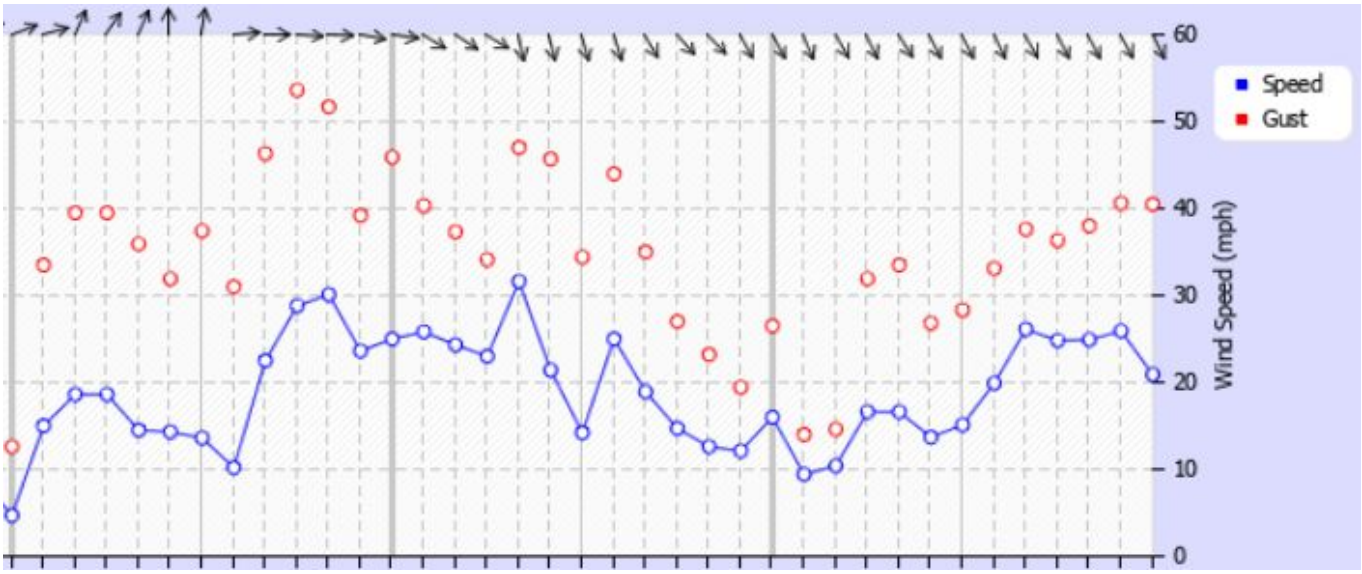
Notable Weather Events

The highlight of this period was the **snowfall on Tuesday (1/5/20)** and the **associated winds** along with it.

The new year (and summary period) began with multiple days of fairly uneventful weather events. Throughout the weekend (1/2 and 1/3), weak embedded shortwaves brought occasional cloud coverage along with light showers favoring the Northwest Mountains. These showers produced just a trace of new snow to favored areas such as Irwin and Schofield Pass. As the weekend ended, a low amplitude high-pressure ridge made headway into our zone, bringing sunny skies, lighter winds, and warmer temperatures for Monday (1/4).

The high-pressure ridge broke down Monday (1/4) night as a **pacific trough** advanced towards Colorado. **Snow started falling early Tuesday morning (1/5)** and continued into the late afternoon hours. This storm produced a pleasantly surprising amount of fresh snow for the favored areas in the forecast zone. Irwin took the cake with 7 inches of new snow while the majority of areas received 2-4”. During the storm, moderate winds initially blew from the southwest. As the storm continued, **wind speeds increased** as **wind direction transitioned to west through northwest**. Westerly wind gusts at the Cinnamon Mtn weather station reached 53mph. at 9 am Tuesday (1/5).

This graphic shows the ridgeline wind direction and speed over the course of Tuesday’s (1/5) storm



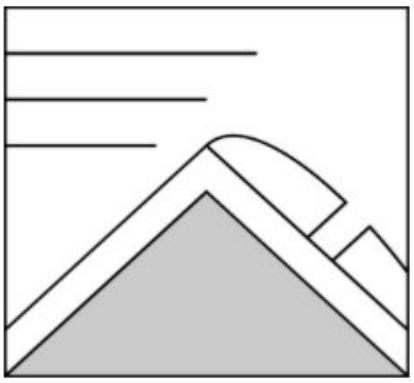
As Tuesday’s low-pressure system exited our forecast area, a high-pressure ridge assembled over Crested Butte making for some classic Colorado bluebird days on Wednesday (1/6) and Thursday (1/7), and Friday (1/8). Clear, starry nights led to our typical valley inversions Thursday (1/7) and Friday (1/8) mornings.

Looking ahead, we will see a storm rolling into town late Friday night (1/8) through Saturday (1/9). Unfortunately, under an unfavorable northeasterly flow, it doesn’t look like it will produce too much new snow, but we’ll cross our fingers. After that, dry weather is in the forecast for the foreseeable future.

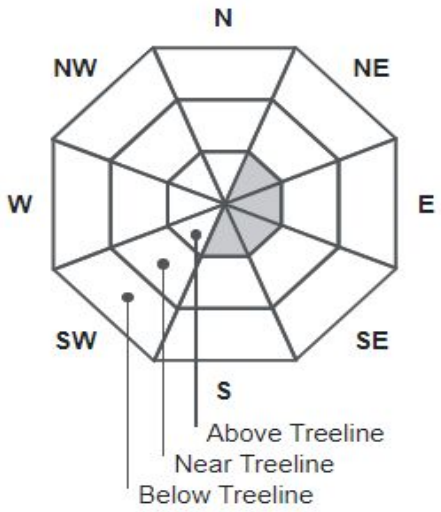
Snowpack (weak layer date(s) and status, structure, stability trends)

The biggest change to our snowpack this week was the 2-7" of snow from the storm on Tuesday (1/5). Moderate southwesterly winds followed by **strong westerly and northwesterly winds** continued into Wednesday (1/6). These wind events redistributed snow creating a new wind slab avalanche problem on NE through E through S facing slopes above treeline. The new transported snow produced these natural wind slab avalanches on south-facing terrain off Mt. Baldy. As of Friday morning (12/8), 3 days after the storm, these wind slabs have become more stubborn to human triggering. However, if you find the right trigger point these small wind slab avalanches could potentially step down to deeper weak layers within the snowpack generating a large, dangerous avalanche.

Wind slab distribution after Tuesday's (1/5) storm

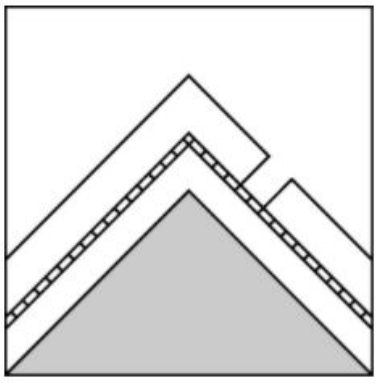


Wind Slab

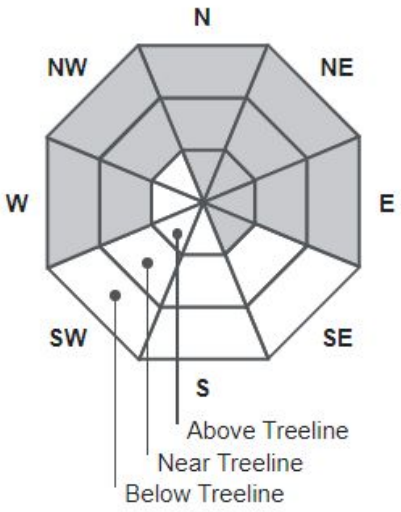


Multiple N/ NW wind events similar to Tuesday's (1/5) occurred sporadically over the past 3 weeks. These winds have disrupted the continuity of many of the persistent weak layers in the alpine snowpack on N and NW facing slopes. N and NW facing alpine areas remain off the persistent slab distribution rose. Moving the discussion from the alpine to **lower elevation, more sheltered areas**. At near and below treeline elevations, **west, north, and east** aspects continue to hold onto the **persistent slab** problem. The alpine snowpack on southeasterly facing terrain remains on the persistent slab distribution due to facets associated with thin melt/ freeze crusts. Due to the amount of solar radiation received, SE facing slopes have slightly thinner (weaker) crust layers compared to S and SW facing slopes. Recreating in areas that face S and SW are your best options to avoid persistent slab structure.

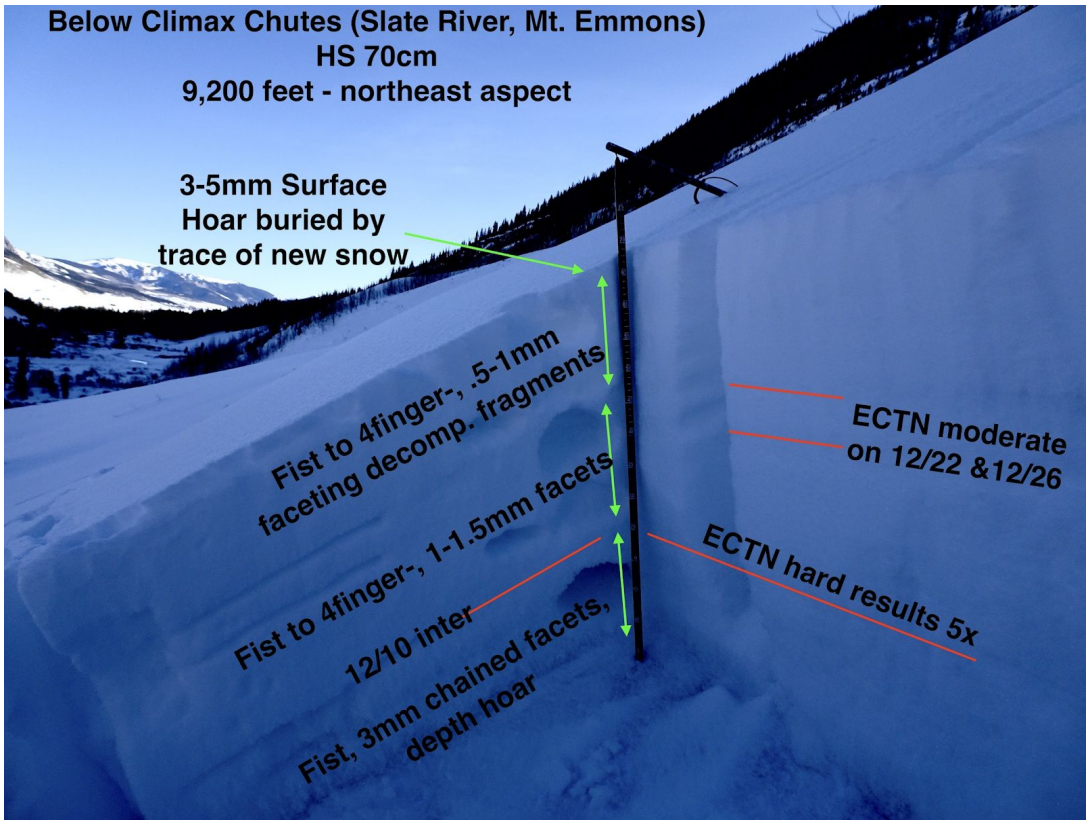
Persistent slab distribution



Persistent Slab



Shown below is a snowpit from the Southeast Mtns. A fist to 4 finger hardness throughout the entire snowpack shows evidence of slabs beginning to facet out (lose strength) due to recent high pressure.



Our last **major** loading event occurred on 12/28, and since then our snowpack has been changing slowly. In the **Southeast Mountains,** in sheltered areas, where the snowpack is thinner than the NE Mtns, high pressure has begun to eat away at slabs. As these slabs facet away, large propagating collapses and remote triggering are becoming slightly less likely. Still, if you do trigger an avalanche near trees and other terrain traps consequences remain high.

On the contrary, in the **Northwest Mountains**, where there is significantly more snow, slabs are harder and have not lost as much strength.

Sheltered terrain facing West through North through East in deeper areas (NW Mtns) remains dangerous due to the stiffer slabs sitting on top of various persistent weak layers/ interfaces (shown below). Check out this video here to see how the hardness of slabs varies as we travel into deeper areas of our forecast zone.

12/10 Interface

The Crested Butte area, along with most of Colorado, suffered through high pressure from 11/23 through 12/9. During this dry period, all areas where snow didn't melt away aggressively faceted. On shadier aspects, this interface has consisted of 1-2 feet of cohesionless faceted grains. These faceted grains have developed into depth hoar near the ground. On aspects with more solar radiation, these facets are associated with melt-freeze crusts. On 12/10, new snow buried this assortment of persistent weak layers. This interface has caused widespread avalanche activity over the past month, such as this helicopter evacuation and this fatality. This persistent weak layer of basal facets/ depth hoar is the worst we've seen in many years. We are nearing a month after it was buried, and we continue to see failure in snowpit tests, as well as natural and human triggered avalanches.

12/22 Interface

During the abnormally warm, dry period from 12/20-12/22, temperature inversions caused surface hoar to develop in protected areas near valley bottoms (where the wind did not have a chance to blow it away). On southerly aspects, thin crust/facet combos developed, whereas on northerly aspects near-surface facets developed. On Tuesday (12/22), 2-4" of snow buried this interface. While the interface was not immediately reactive, the 12/28 storm helped push this interface to its tipping point.

12/26 Interface

After a storm on 12/22, two days of clear skies and temperature inversions drove near-surface faceting on shady aspects, while effectively forming a melt/freeze crust on sunny aspects. On 12/26, a pacific trough moved overhead peak precipitation intensity occurring on the night of 12/28. During the peak of this storm, many storm slab avalanches ran on this old snow/ new snow interface.

Avalanches

Wind Slabs due to 1/5 wind event

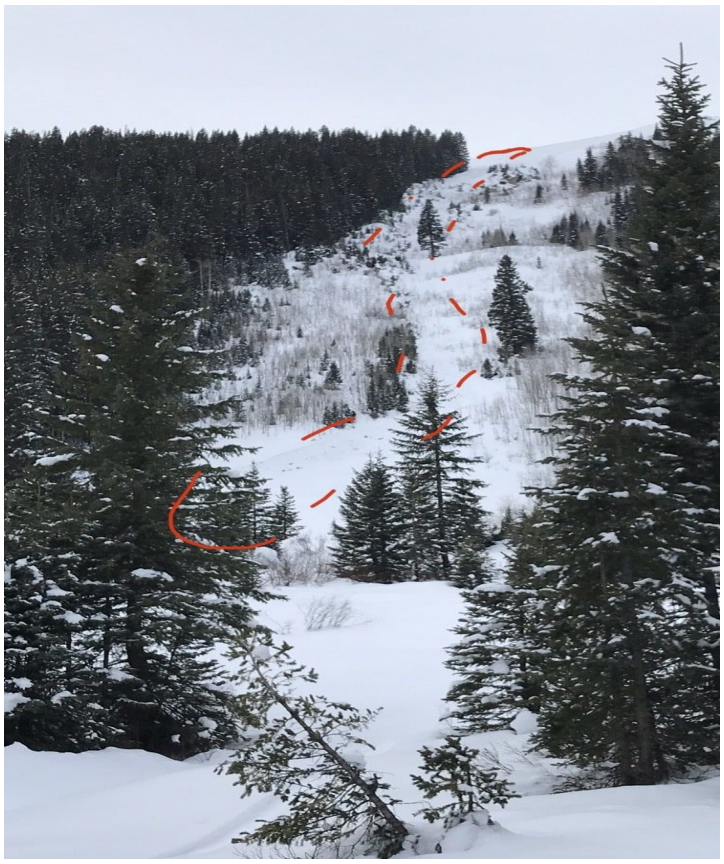
Wind slab avalanche on SE facing aspect above treeline

Skier triggered avalanche on a southerly (leeward) facing slope of Mt. Baldy

Persistent Slabs

Skier triggered persistent slab avalanche near Irwin (NW mountains) which failed on the 12/10 interface

Remotely triggered R2D2 in West Brush Creek (SE mountains) on 12/10 interface



Incident, accidents, close calls

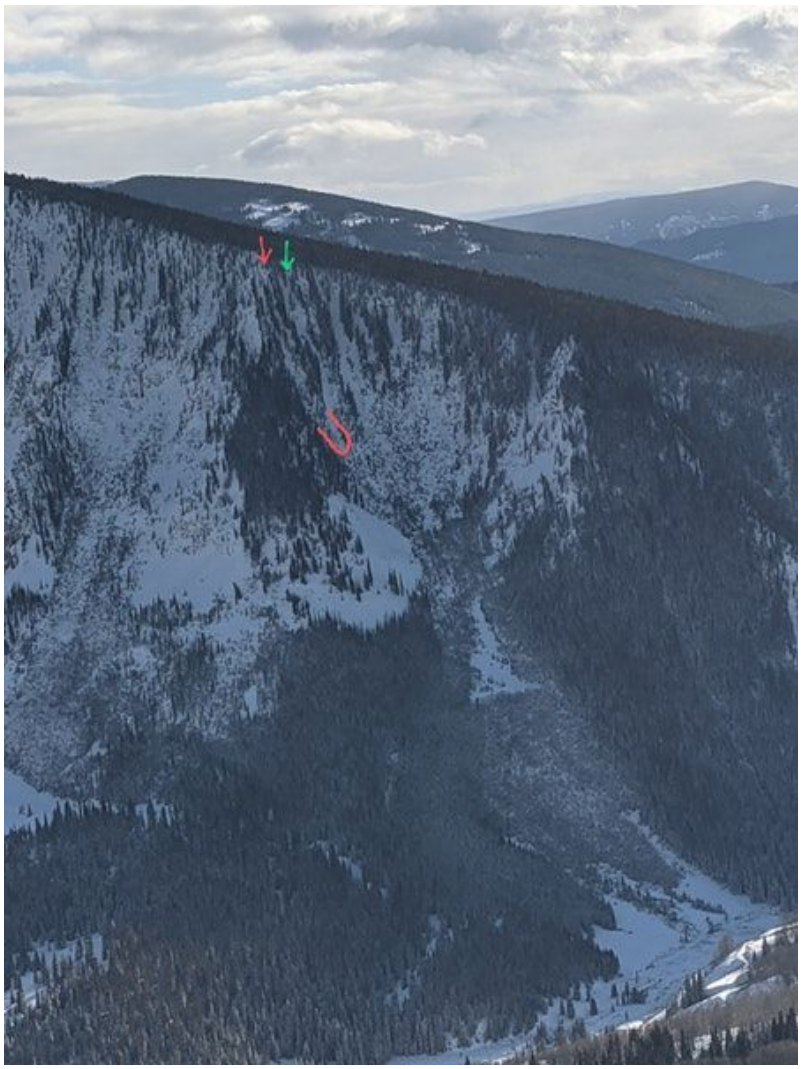
On 1/2/21, a skier was caught and carried in a persistent slab avalanche in an area known as First Bowl on Mount Axtel. The avalanche occurred on a NE facing slope below treeline. The avalanche was a soft slab, large enough to bury, injure, or kill a person, and small, relative to the path. The slide failed at the top of the 12/10 interface. Thankfully there were no injuries.

SS-ASu-R2D2-O

The party had skied one lap prior to triggering the slide (green arrow). On the first lap, they noticed no signs of instability (no cracking or collapsing). Their stability tests were benign and ski cuts produced no results.

On their second lap (red arrow), skier 1 skied approximately 150 ft. into the chute before pulling out into the trees. Skier 2 followed, while making a final turn out of the chute to regroup with skier 1, he triggered the slide and was carried about 50 ft downslope before skiing out of the path of the slab. The crown was 1-2.5 ft deep and the debris ran about 700 ft.

This avalanche occurred 30 days after the pesky 12/10 interface was buried. The lack of obvious signs of instability noticed by the skiers highlights the trend of our current persistent slab problem: Increasingly irregular and variable feedback. Some slopes are behaving differently than others due to spatial variability, which can leave you easily surprised. Managing the persistent slab problem has become increasingly challenging as the complexity in the snowpack increases. We'd like to genuinely thank the skiers for submitting the observation. Observations like this are a great learning experience for the greater backcountry skiing community.



Comments (anything unusual/noteworthy, thoughts on the near future)

We are currently hovering in a “scary moderate” avalanche danger rating. Over the past couple of weeks, the snowpack has consistently given us loud whumphing, cracking, naturals, and other obvious signs of instability. Over the next period of moderate weather, the snowpack will trend to becoming a bit quieter. Keep in mind the irregular and inconsistent feedback characteristic of persistent slabs. Just because you don’t notice signs of instability throughout your tour, does not mean they are not there. Stay vigilant and safe out there! The graphics below show below-average precipitation and above-average temperatures for the next 6-10 days.