Backcountry Weekly Summary



Staff:	Zach Kinler
Week and Year	December 6th-12th, 2019
Backcountry zone:	Crested Butte Area

Notable Weather Events (snowfall, SWE, winds, temps, etc.)

This period began with a closed mid-level low pressure system tracking West from central California. Although not a particularly strong storm, it had high amounts of moisture, decent lift as the storm passed overhead as well as favorable SW flow. These ingredients came together to get the most out of this storm. On 12/6 and 12/7 skies were clear and the inversion set in with below zero temps in the valleys and the mountains remaining in the 20s. WSW flow and strong solar warmed things nicely with the freezing level ~10.5K. SW flow began transporting moisture ahead of the next system with clouds increasing by late in the day on 12/7.

On 12/8 a strong Pacific low pressure system split into two smaller shortwaves with the southern wave moving over Colorado while grabbing some moisture from a 140-150 knot jet stream. This jet provided lift in combination with favorable WSW flow to get snow started during the first phase of the storm. A strong cold front moved through during the second phase switching winds to West then NW with the heaviest snowfall occuring during this time. Orographics kept light snow going on the backside of the departing storm.

Following this storm, 12/9 and 12/10 were cold and blustery days with NW flow in place. Light orographic snowfall continued in the mountains on 12/9 while the winds became the big story. Moderate-strong W-WNW winds were able to move available snow especially North and West of town. Winds continued to blow from the WNW on 12/11 under increasing clouds as temperature rebounded slightly under a strong inversion. Light snow showers began on 12/12 with cold temps in the teens and light NW winds ahead of a prolonged period of snowfall with disturbances moving through in moist zonal flow.

500 mb relative humidity and wind speed charts for the 12/8 cycle. Notice the tap of moisture from the Pacific ocean being efficiently transported by a strong jet stream rounding the base of the trough.



Storm Totals 12/5-12/6 Schofield Snotel: 1.0" SWE/ 10" snow Butte Snotel: 0.5" SWE/ 7" snow Upper Taylor Snotel: 0.3" SWE/ 3" snow Paradise Divide area: 12" snow(ob) Town: 6"(ob) Storm Totals 12/8-12/9 Schofield Snotel: 1.2" SWE/ ~12" snow Butte Snotel: 0.4" SWE/ 5" snow Upper Taylor Snotel: 0.7" SWE/ 8" snow CBMR: 9"(estimated from cam)

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



11/20/19 Interface: Multiple early season storms dropped 1-2 feet of snow throughout our area in October. An extended dry period followed for most of November with warm temps and sunny skies which left the southern half of the compass mostly bare while continuous old snow remained on shady aspects facing N-E from around 10,000 ft. and up. Sheltered areas free of wind and sun harbor the weakest grains. This old snow was buried on 11/20 and is now our layer of most concern. Initially, a thin crust was observed on top of this old snow as seen in this <u>Paradise</u> <u>Divide Ob</u> with facets and early stage Depth Hoar growing to 4mm underneath. This <u>Kebler Pass</u> ob highlights this interface and where it was found west of town. Moderate snow and wind loading stressed this layer leading to our first widespread avalanche cycle around 11/30 as seen <u>here</u>. This <u>Cement Creek Ob</u> shows this layer is more isolated but present at upper elevation drifted spots near and East of town. This continues to be our layer of most concern as most avalanches are releasing on this layer or stepping down to this layer. Check out this <u>natural avalanche ob</u> from Kebler Pass area highlighting large, persistent slabs failing on this layer. This layer is now buried~40cm-90 cm deep.

11/25/19 Interface: Following the 11/20 cycle, the area saw 2 days of sunny skies and cold clear nights which effectively melted or crusted the recent snow from the southerlies while near surface facets and large grain Surface Hoar were able to form on the northern half of the compass. This weak snow is observed on the surface in this <u>Photo</u> and this <u>Photo</u>. A ski cut released a very small avalanche on this layer in this <u>Ob</u>, and time will tell if this layer remains active with additional loading. At the <u>Elkton Study Plot</u> last week, propagating results were observed on this layer as the slab on top has settled into a 1F slab with warmer temps. On 12/5 a <u>rider-triggered D2</u> avalanche failed on this layer. This interface is near the ground where October snow did not exist, and rests on melt forms or large grain facets where snow remained from October. This interface is generally ~40cm-70cm deep.

11/29/19 Interface: At the Elkton Plot site this week, 1.5 mm near surface facets were observed at this interface with moderate CT and shovel tilt test results. This layer appears to have more strength than the 11/20 and 11/25 but will need to be monitored for future activity. The most recent visit to the Elkton Plot revealed no results on this layer as it has consolidated with surrounding layers. While not off the list, this layer does not appear to be a major player right now.

12/5/19 Interface: High pressure with cold nights and warm days during the first few days of December weakened the snow surface with surface hoar and near surface facets forming on shadier aspects in particular. This <u>Pittsburgh</u> <u>Ob</u> highlights this layer found in a shovel tilt test. This <u>Anthracites</u> observation has this layer ~30 cm as of 12/8 with cracking and failure observed. After recent snowfall this layer is now ~ 30cm-50cm deep and continuing to cause failure as seen in this <u>large and complex avalanche</u>. On southerlies, this <u>Paradise Divide</u> ob shows this layer as a crust/facet combo which will need to be watched with future loading.

12/9/19 Interface: Two days of clear skies, below zero valley lows and strong solar radiation led to the formation of this interface which is more than likely a crust on southerlies and surface hoar/near surface facets on the shadier side of the compass. This week at the Elkton Study Plot, this layer was 1.5 mm near surface facets with results on a shovel tilt test. It is buried ~15cm-30 cm. Time will tell if this will be a player in the interface game.

Avalanches



Two avalanche cycles occurred this week following the two weather events. Each cycle consisted of numerous D2 avalanches failing in old snow buried within the snowpack or near the ground. Some of these initiated in the upper snowpack and were able to step down to near the ground. Strong westerly winds after the 12/8 cycle continued to load the easterly half of the compass with naturals running up to 12/10. The distribution of these avalanches was generally similar to previous cycles with the bullseye on N-E aspects at all elevations in the snow favored zones, however as the large avalanche below illustrates, a persistent slab problem is starting to develop on SE aspects where crust facet combos are finally seeing a slab forming over them. With the distribution of snow much more continuous throughout the forecast area, avalanche size and distribution will be on the increase with additional loading. The shallower Crested Butte, Brush Creek and Cement Creek zones will likely see their first major avalanche cycle with this incoming storm.



Augusta Mountain, SE aspect above treeline. The first evidence of an expanding persistent slab problem.

This D2 avalanche initiated in the upper snowpack and stepped down into weak layers all the way to the ground.



Incident, accidents, close calls

This week there were no incidents, accidents or close calls reported to the CBAC in the Crested Butte area. Multiple large, human triggered avalanches were reported just to the north in the Aspen zone and can be seen <u>here</u> and unfortunately the first avalanche fatality in the state occurred on 12/8 near <u>Cameron Pass</u>.

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



The future looks snowy as we are under winter highlights for the next 4 days. 1-2 feet of snow is likely with higher amounts possible. Following a week with multiple storms, our snowpack is growing quickly and tracking ahead of average at this time. This trend looks to continue this coming week as its really starting to look like winter.