

Backcountry Weekly Summary

Intern:	Zach Kinler
Week and Year	Dec. 28, 2018- Jan. 3, 2019
Backcountry zone:	Crested Butte Area

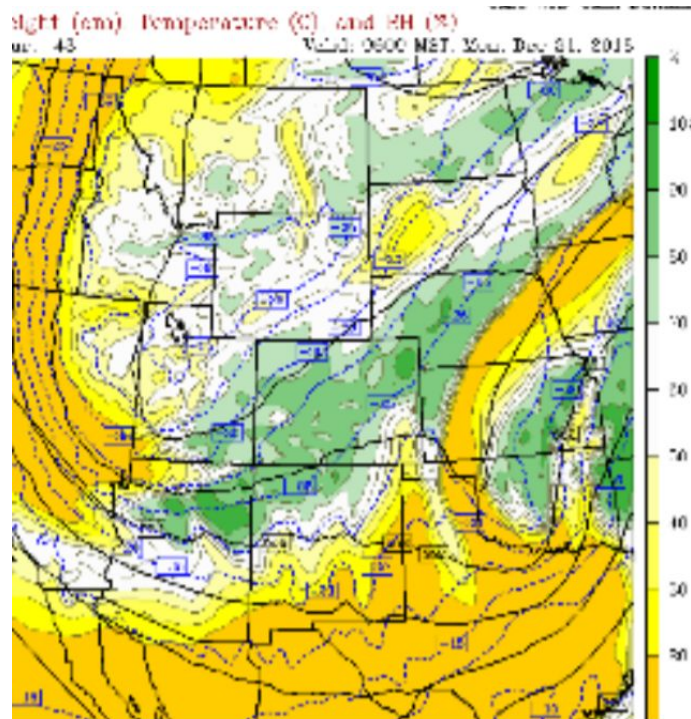
Notable Weather Events (snowfall, SWE, winds, temps, etc.)

This period began with our area under the influence of high pressure and N-NW flow on the east side of a ridge of high pressure. This transitioned on Dec 29th as a trough dropped down from the northern Rockies, strengthening and closing off as it reached the four corners. As this storm slowed and closed off, we saw WSW and SW winds as it passed by and this gave us another decent shot of precipitation and a strong cold front. Totals ranged from 5"-12" of low density snow across the zone with up to .5" SWE. Winds switched around to the SE after the trough axis dropped to our south which shut the snow machine down for our area, however the San Juans saw their best snow of the season.

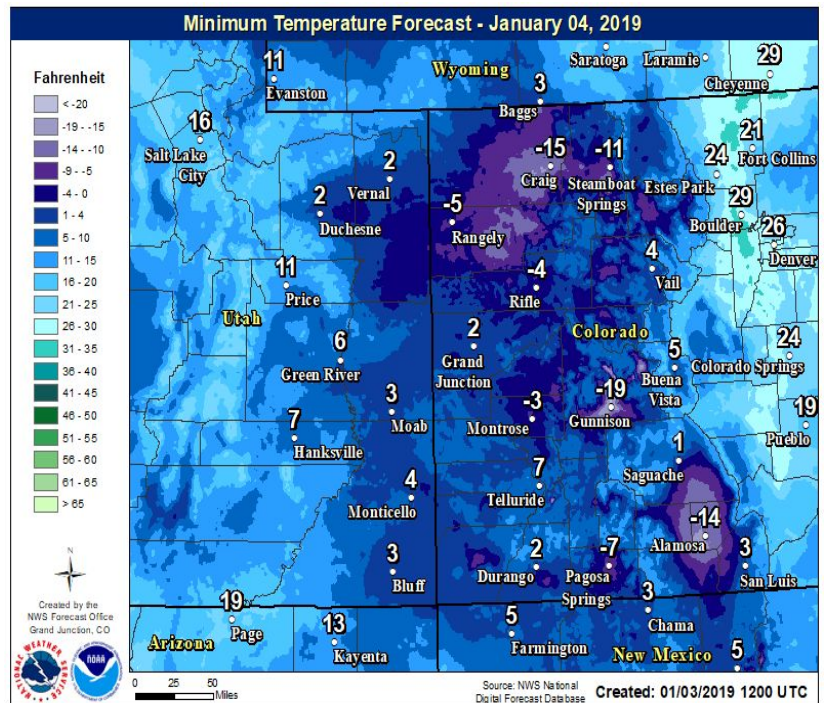
Following this storm, we saw high pressure build back in to close out the week with very cold temperatures in place and strong inversions due to continuous valley wide snowpack. Light-moderate NE winds wrapped around the large low as it moved downstream into the Midwest.

Also worthy of mentioning was a short period of Westerly winds on Dec 29th as the New Year's storm approached. During this time, the Scarp Ridge weather station recorded sustained winds of 15 mph with gusts to 30 mph for only ~ 3-4 hours however this was able to move some available snow and create a few minor avalanche problems (see 'Avalanches' below for more on that).

500 mb Temp and Relative Humidity on Dec 31st showing our New Year's Eve storm pumping moisture into Colorado.



Forecast Lows for Western Colorado with the Gunnison Basin having the coldest temperatures in the state after the New Year's storm.



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

11/22/2018 Interface: This interface was given several names, Gobbler interface, Turkey Day interface, Thanksgiving interface. Early November snowfall provided a mostly continuous snowpack in our snowbelt North and West of town, and continuous snowpack on N-E aspects near and above treeline in the Eastern/Southern zones. This snowpack faceted away during our mid November dry spell into well developed facets and early Depth Hoar. Once buried this layer was immediately reactive with modest loads and easy propagation. During the first week of December after continued snow and winds, several large (D2-D3) natural avalanches in the alpine and near tree line failed on this layer as well as a skier triggered D2 avalanche on a West aspect in an area where explosives had been used prior with no results. This highlights the tricky nature of this PWL. During the second week of December, this layer produced another small skier triggered slide on a West aspect BTL and two large (D2-D3) slides on E-SE aspects in the alpine after continued winds and snowfall.

We have not seen a natural or human triggered avalanche on this layer since Dec. 13th. Reports of cracking and collapsing on this layer are non-existing and long column tests are continuing to consistently show no results on this layer. These facets and depth hoar are rounding and sintering and are at least 4F hardness in many places with deeper locations in the alpine at 1F hardness.

In our Eastern zones, this layer was alive and well in early-mid December and has produced “plenty of old avalanches” as seen in this observation from the [Cement Creek](#) zone where the snowpack is much thinner. A recent report from the CAIC in this zone shows many small PS avalanches but failure was occurring in weak layers higher up in the snowpack. Despite that evidence, profiles show weak snow remaining at the ground which may still be activated with larger loading.

For the deeper parts of our zone, there is no doubt that this layer has been Stubborn-Unreactive for a couple weeks now but can it hold a large loading event or the weight of a large avalanche releasing in the upper snowpack? This layer will not be dropped from the list just yet.

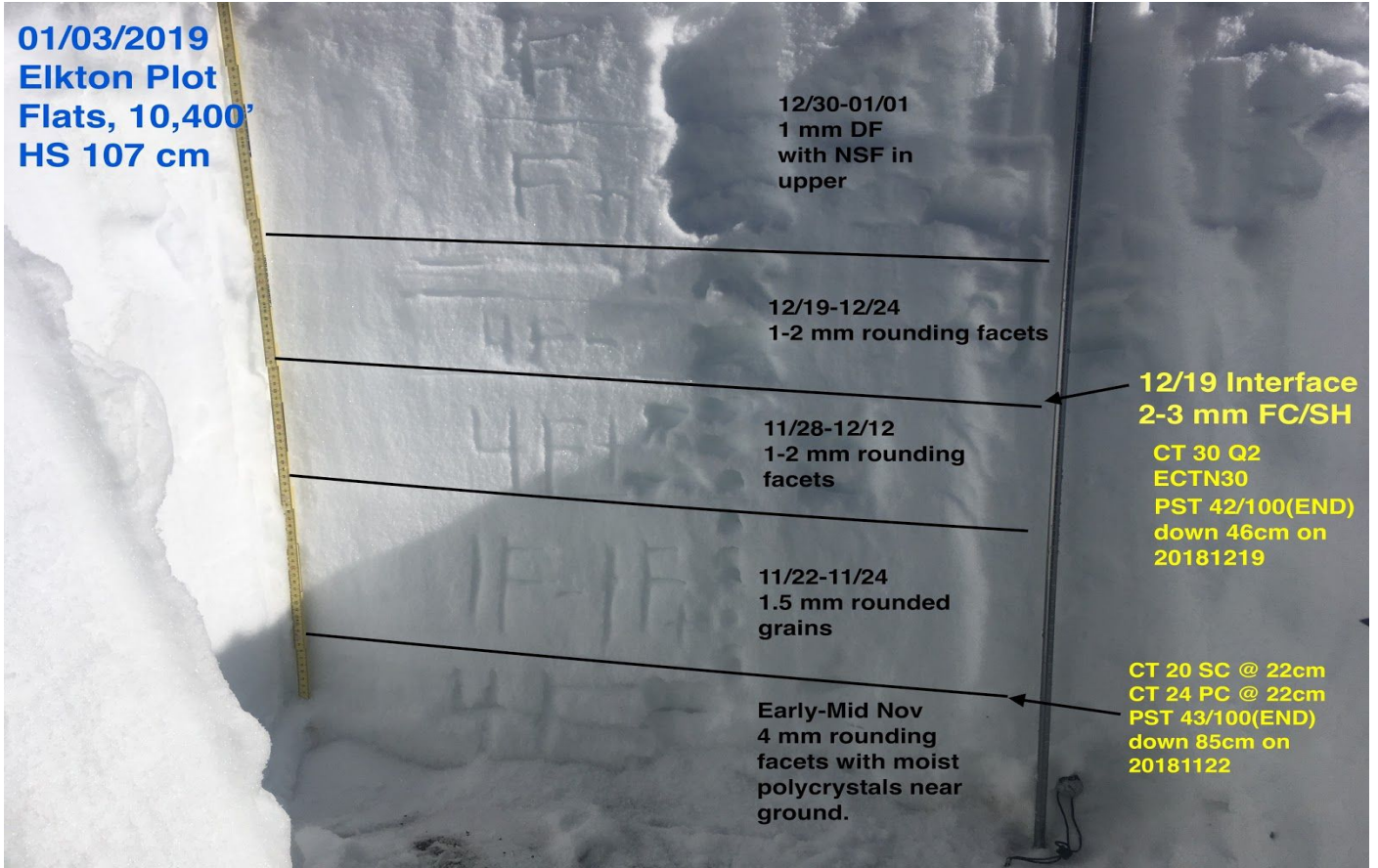
12/12/2018 Interface: There were multiple nights of Surface Hoar formation during this week which finally got completely buried on 12/12 across the zone by several inches of snow. Distribution is fairly widespread and has been found in the Kebler Pass, Paradise Divide and Crested Butte areas as seen in these obs([Wolverine Basin](#), [kebler-pass-buried-surface-hoar](#), [below-and-near-treeline-obs-out-slate-river-valley-and-buried-SH](#)). This layer is now buried between ~50-70 cm with softer F-4F slabs in protected areas to 1F slabs on certain leeward features near and above tree line. Recently, this layer has been less reactive in tests however it is very close to the 12/19 interface and it would be hard to rule it out on a few of the recent slab avalanches that have released in the upper snowpack. Will need to continue to monitor for this one.

12/19/2018 Interface: This is our most widespread weak layer which developed over the second week of December with high pressure, sunny skies and cold overnight temperatures. This layer is now buried ~45-65 cm with softer F-4F slabs in protected areas to 1F slabs on certain leeward features near and above tree line. On sunny aspects, we are dealing with a variety of crust/facet combos; shady aspects have surface hoar down low and near surface facets as you get near and above treeline as seen here: [se-s-sw-ntl](#) and [afternoon-lap-skook](#). After the X-mas storm and with SWE amounts on this layer exceeding 1”, several D2 avalanches were observed here ([p-divide-shaded-treeline-structure](#) and [north-below-treeline](#)). This week, we saw many a small avalanche releasing on this layer, especially in the Cement Creek zone. On 12/29, a small wind slab on an open South aspect was more than likely on this layer. This layer remains quite weak across many aspects with shadier slopes lacking a stiff enough slab to propagate and crust/facet combos on the sunnies just strong enough to hold the growing slab on top. We are all waiting to see a significant load on this layer.

12/21/2018 Interface: This ob from [Irwin](#) highlights this layer as a crust and small and long column tests from the Elkton Study Plot last week had failures on this layer which now sits 5 cm above the 12/19 interface at this site. This week, observations from Irwin highlight a layer of facets between the 12/19 and 12/21 crust keeping this on the radar for now. This layer was not reactive in the Elkton Plot this week as it appears to have consolidated into slightly stiffer snow sitting above the 12/19.

12/30/2018 Interface: This is the most recent interface to join the party and is another Surface Hoar layer on shady aspects as seen here ([Dec 30 interface](#)). In this report ([here](#)), this Surface Hoar was observed to remain preserved on South aspects which is rare however, a cold night on Dec 29th was followed by clouds moving in early on the 30th

which may have prevented this layer from cooking off on the southerlies. This is another interesting layer in our upper snowpack Persistent layer cake.



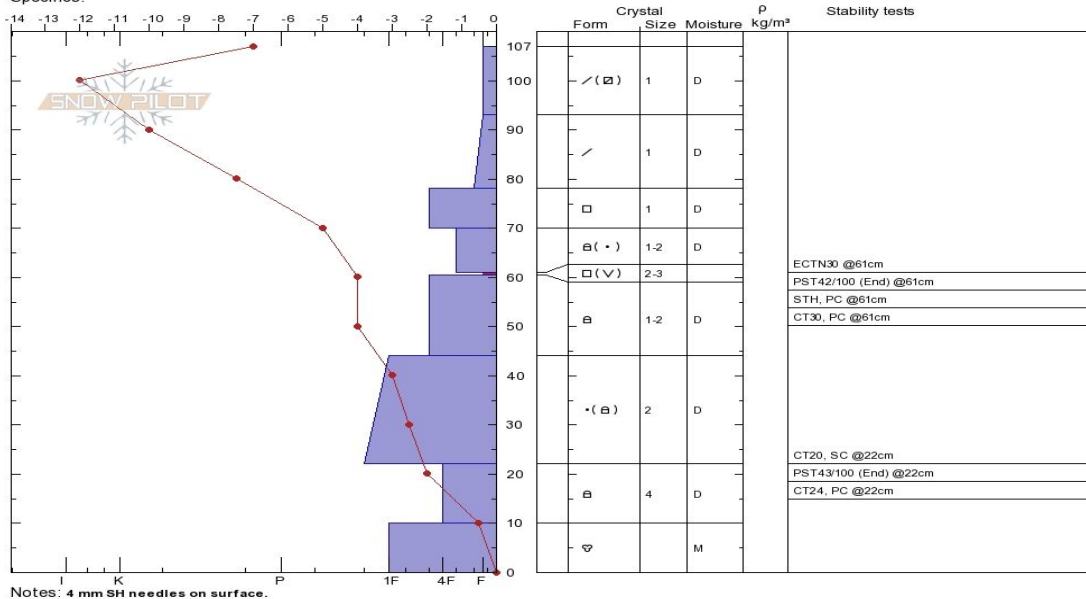
Elkton Study Plot
Elk Mountains
CO
 Elevation: **10400 ft**
 Aspect: **250°**
 Specifics:

Zach Kinler
Thu Jan 3 11:16 2019
 Co-ord:
 Slope Angle: **4°**
 Wind Loading:

Stability:
 Air Temperature: **-2°C**
 Sky Cover: **CLR**
 Precipitation: **NO**
 Wind: **Calm**

HS107 PF50
 Stability Test Notes

Layer Notes
60.5-61: Problematic layer



Avalanches



This large D2.5 avalanche ran ~01/01/19 on an East aspect just to our North near Independence Pass. The weak layer was faceted crystals in the upper half of the snowpack and indicates the type of avalanche that is possible with our current set up. Notice the sympathetic release lookers left under the cliff bands.

Our snowpack continues to receive incremental loading that is slowly adding up on our weak layers but also allowing time for the snowpack to adjust. To this point, we have seen numerous small slab avalanches on specific terrain features releasing on NE, E, SE and W aspects. The large avalanche above from the nearby Sawatch zone shows the potential of these layers in the upper half of our snowpack to propagate and collapse large portions of the slope if the load is sufficient and these layers are present.

A secondary Loose snow avalanche problem has developed BTL on steep shady slopes where unconsolidated snow exists down to the ground in certain areas. These areas have the potential to see loose sluffs and point releases entrain much of the season's snowpack on the way down and are now large enough to warrant concern and avoidance. This ob, [Sluffy](#) illustrates this problem well as does this [Anthracite Mesa](#) area ob from CAIC reporting 5-6 feet of debris from a loose slide in a major terrain trap.

A few very small wind slabs also developed and released on 12/29 after elevated W-WSW winds for a short period.

Incident, accidents, close calls

On 12/29, a D1 hard slab pushed a skier ~20 feet and caused him to lose a pole as seen [here](#). This small slide was the result of short-lived West winds loading a small terrain feature just right. A good reminder that avalanche problems form quick and can catch you by surprise.

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

Our focus has shifted to the upper half of the snowpack where multiple weak layers may be teetering on the brink of failure when we finally get that big storm. With sub-tropical moisture making its way towards the area this weekend, we are all hoping for a big hit.