

Backcountry Weekly Summary

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| Intern: | Zach Kinler |
| Week and Year | March 8-14, 2019 |
| Backcountry zone: | Crested Butte Area |

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

This week saw continued periodic snowfall with a light rain event up to around 10,000 ft. On 3/8 the main moisture feed from our previous major event had finally pushed eastward however there was plenty of residual moisture and orographics in westerly flow, and snow continued to pile up with another .5"-1.5" SWE. 3/9-3/10 were mostly dry and warm with temperatures pushing above freezing up to ~11,000' as flow shifted around to the SW in front of the next multi-faceted storm system.

On 3/11 a low pressure system off the coast of CA dropped South towards Baja before lifting NE towards CO. A strong jet rounding the base of this southern Low provided moisture and lift. At the same time the southern Low was tracking towards CO, a strong and cold shortwave was dropping down from the NW. The southern and northern systems converged over Colorado on 3/12 -3/13 with much of the energy and dynamics over the Front Range and plains with blizzard conditions.

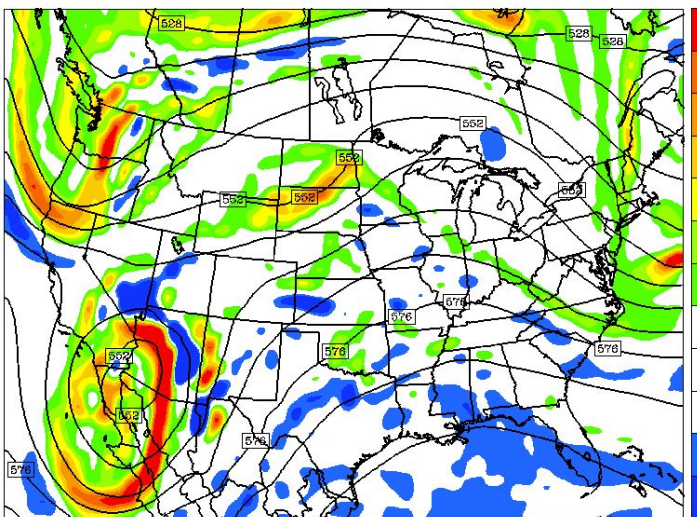
Our area saw wet heavy snow and rain initially in southerly flow transitioning to colder W-NE flow as the colder Low made its way in. 6"-17" of snow fell around the zone with the Kebler Pass area fairing very well. SWE amounts were generally .5"-1.5". This storm brought strong winds blowing from a variety of directions from S-W-N-NE.

500 mb pressure/vorticity runs from the GFS showing the approach and convergence of two separate Pacific storm systems over Colorado. This strong cyclone brought rain and snow to our area and heavy snow and blizzard conditions on the Eastern Plains.

500 mb Height (dm) and Absolute Vorticity (s^{-1})

Forecast hour: 36

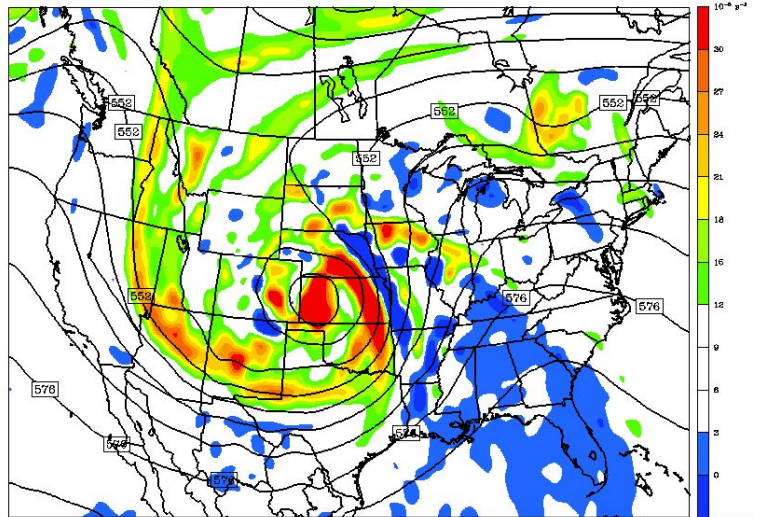
Valid: 1200 MDT, Tue, Mar 12, 2019



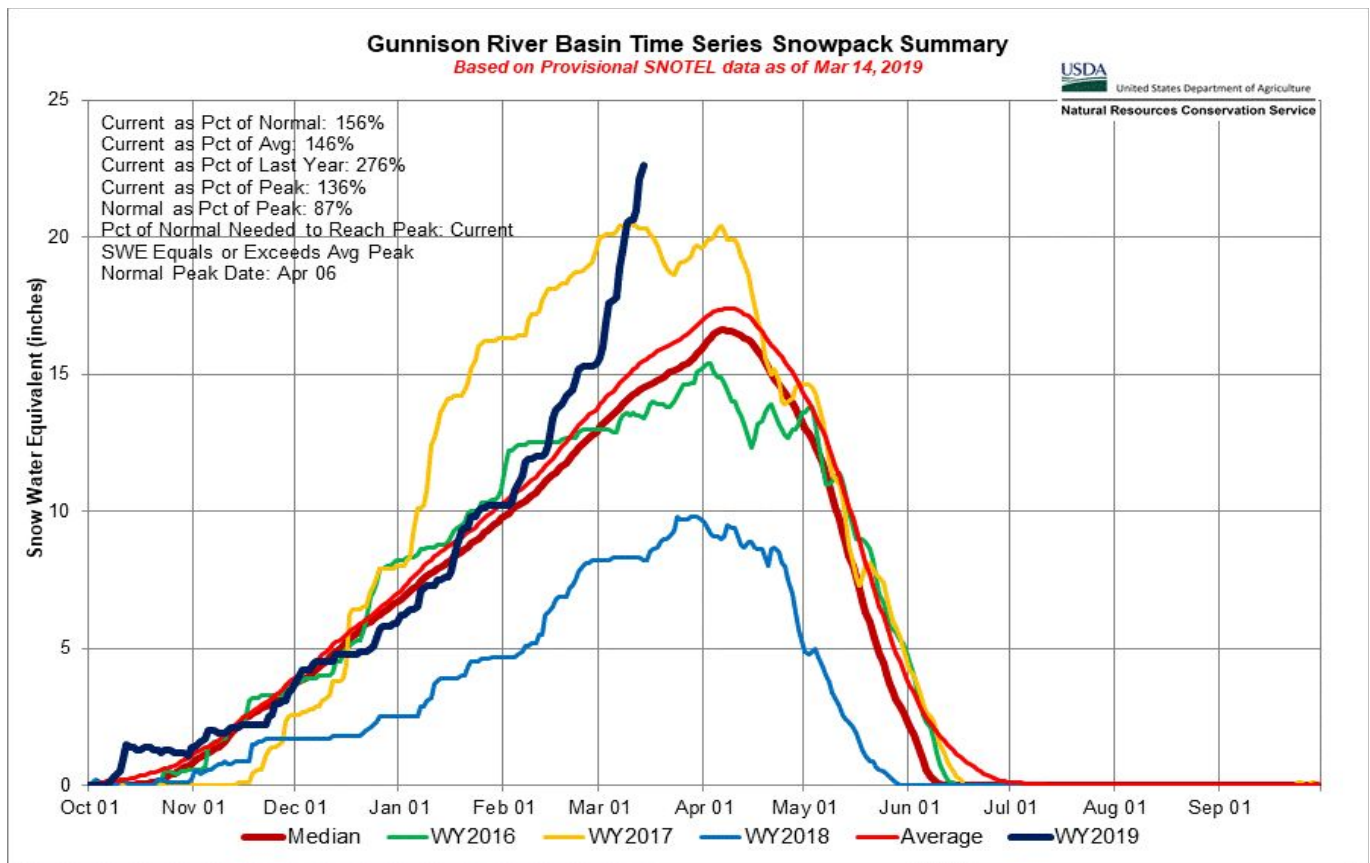
500 mb Height (dm) and Absolute Vorticity (s^{-1})

Forecast hour: 63

Valid: 1500 MDT, Wed, Mar 13, 2019



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



12/19/2018 Interface: This layer from our mid-December dry spell was unreactive in small and long column tests this week at the study plot. When originally buried, we were dealing with a variety of crust/facet combos on the southerlies with shady aspects having 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](#)). After the "Holiday Slabs" came in, we again saw many a small avalanche likely releasing on this layer, especially in the Cement Creek zone. During the avalanche cycle from 1/16-1/24, several very large avalanches on [White Mountain](#) and [Whetstone](#) likely broke on this layer in the shallower zones near Crested Butte. This interface is still visible in snow pits with varying results in short and long column tests. This [Crested Butte area](#) observation revealed a significant slab over this layer with propagating results in a long column test. While less of an issue in our deeper snowpack areas, this interface is still a player, especially in our shallow zones around town and to the East. A couple recent very large avalanches breaking deeply in the snowpack and many step-down avalanches have been failing around this layer. This [recent natural activity](#) highlights a couple slides breaking very close to the ground and this [very large Gothic West side avalanche](#) breaking at the ground may involve this interface.

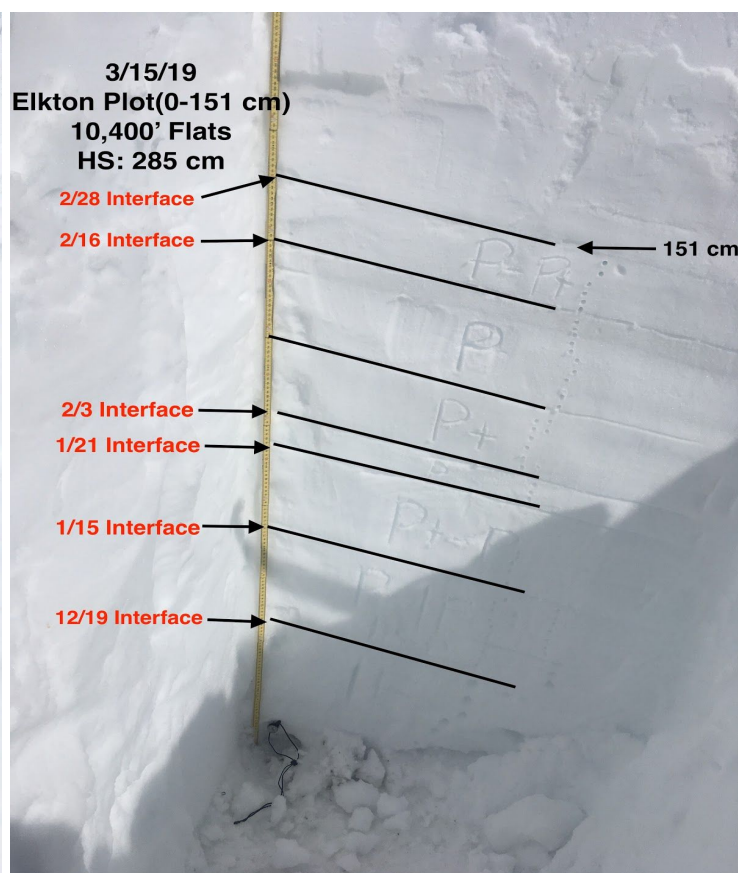
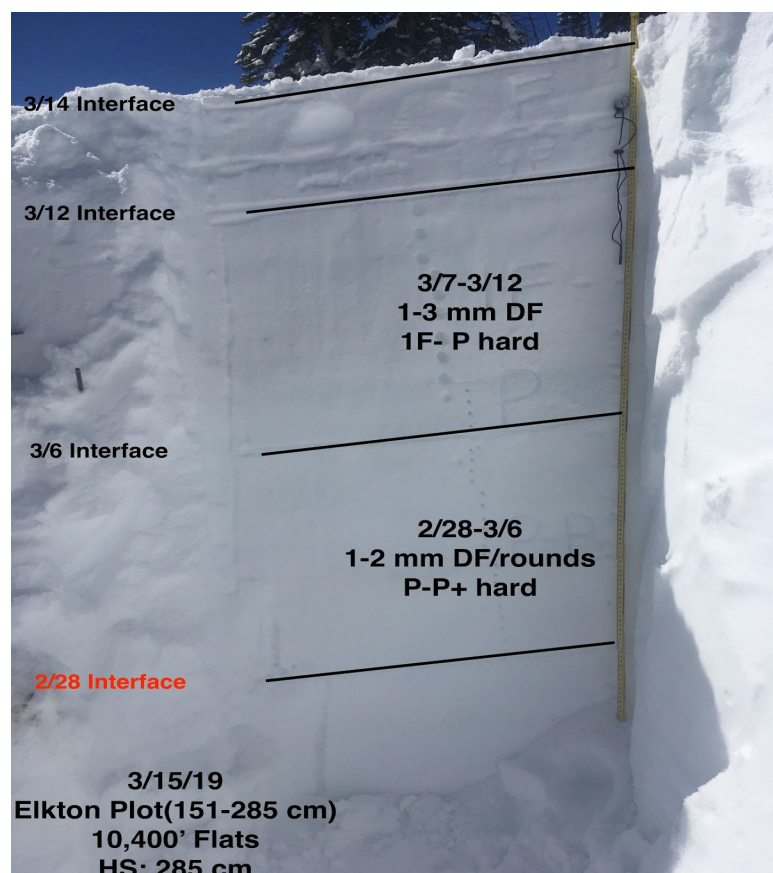
01/15/2019 Interface: This layer formed after the minor accumulations around 1/10-1/12 fell on the weak surface from after 1/06 and was observed as 6 mm SH on a SE aspect @ 11,500, and 3-4 mm SH at the Elkton Study Plot @ 10,400'. Take a look at this observation, [surface-obs](#), from the Paradise Divide area which documents this interface as well. This [skier triggered](#) avalanche on a S aspect in the Kebler Pass area ran on this layer, which was a crust, as did [this](#) avalanche. Last week in the Crested Butte zone, this layer was observed as SH on top of a crust/facet combo on a SW aspect near treeline and produced propagating results. This interface was involved in a skier triggered avalanche on the South face of Baldy (see "Incidents, accidents and close calls" below). This [Kebler Pass zone](#) observation reveals this layer of concern in our deeper zones as does this with [Propagating results](#). [Explosives testing](#) got results on this layer last week and future loading will certainly stress this interface. This [CBAC observation](#) reveals this layer to be healing in a deeper snowpack as do tests in the Elkton Study plot, however in shallower zones less than 200 cm, it likely has not healed as efficiently and may still be a culprit as many recent avalanches are stepping down deeply such as this recent very large [Gothic](#) avalanche.

1/21/2019 Interface: Warm days with highs above freezing and cold nights under brief High Pressure following our 1/15-1/18 cycle led to the formation of surface hoar, near-surface facets and crusts depending on aspect/elevation which got buried initially by our “MLK” storm and now sits ~60-80cm deep after the most recent loading. This layer was the culprit in this [Elk Creek skier triggered](#) avalanche. This [large remote-triggered](#) avalanche occurred a few days later with this interface likely involved. In late February, there were no results on this layer at the Elkton Study Plot and this [CBAC observation](#) reveals this layer to be healing in deeper snowpacks but still a potential offender in the shallower snowpacks less than 200 cm. Again, recent natural avalanches breaking deeper into the snowpack may be stepping down and through this layer.

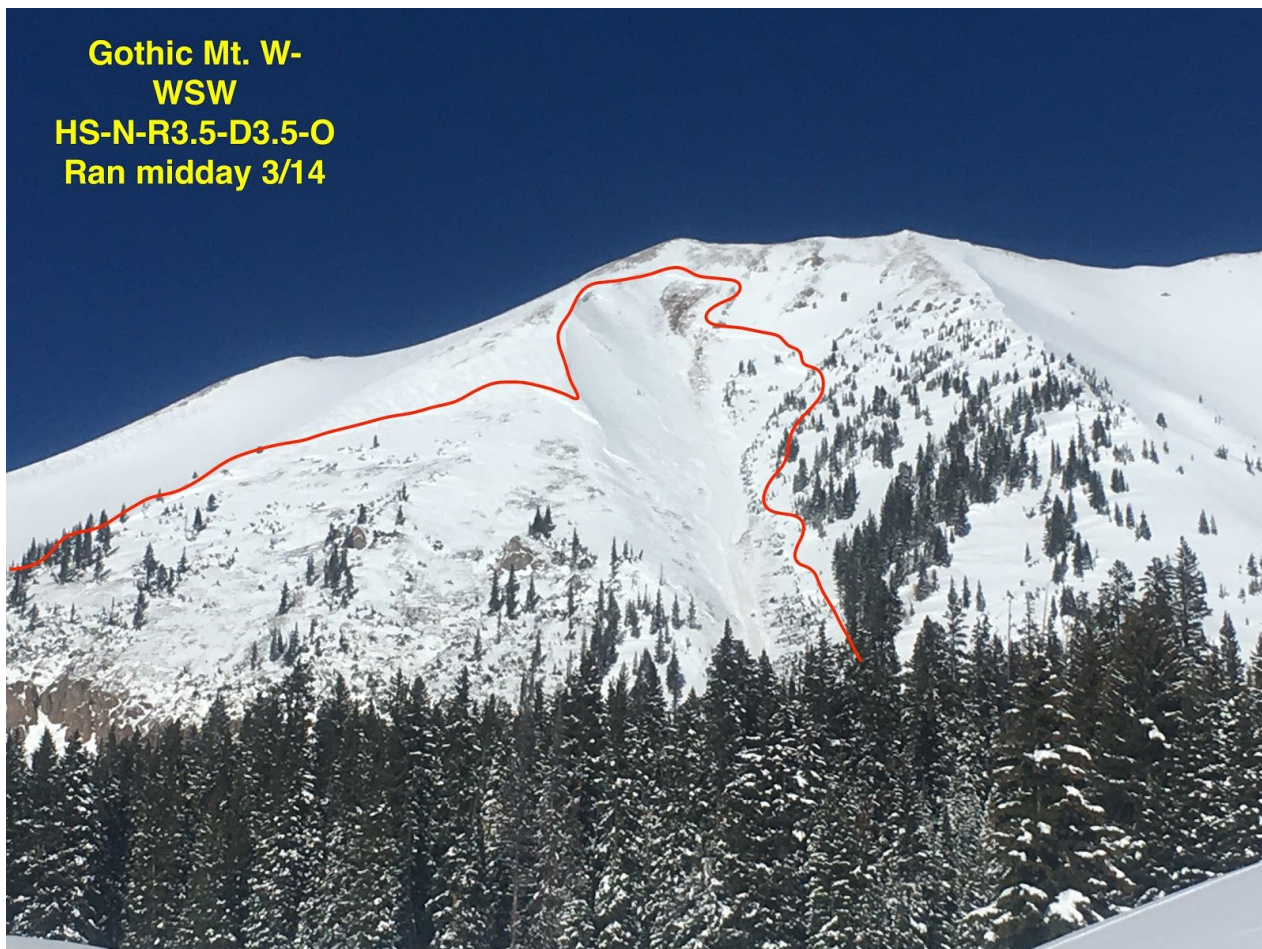
02/03/2019 Interface: This is our most recent layer of concern and is fairly widespread layer of small near surface facets on shadier aspects and crust/facet combos on sunnier aspects. This layer formed during a period of stable weather with sunny skies, cold nights and warm days after last week’s storm cycle and got buried in the first hours of 2/03 by a storm which came in with widespread graupel making it easy to identify in pit walls. This interface was immediately reactive in pit tests as seen in this [Paradise Divide](#) observation. On a South aspect, this layer produced propagating results before the Valentine’s loading as seen [here](#). Prior to our “March Madness” event which has buried this layer under 185 cm of P hard slab at the Elkton Study Plot, facets were observed on 2-3 mm graupel particles. No test results were seen however prying of the slab produced planar fractures. Because of the current depth and trend, this layer is not concerning at this point.

02/16/2019 Interface: This layer formed on 2/15 when skies cleared and late the February sun was able to form a crust on aspects in the sun. This layer is seen on a WSW aspect in this [observation](#) from above Pittsburg with small facets forming below. It appears this layer is confined to sunny aspects as a melt-freeze crust which has broken down this week at the Elkton Plot and does not present any concerns at this point.

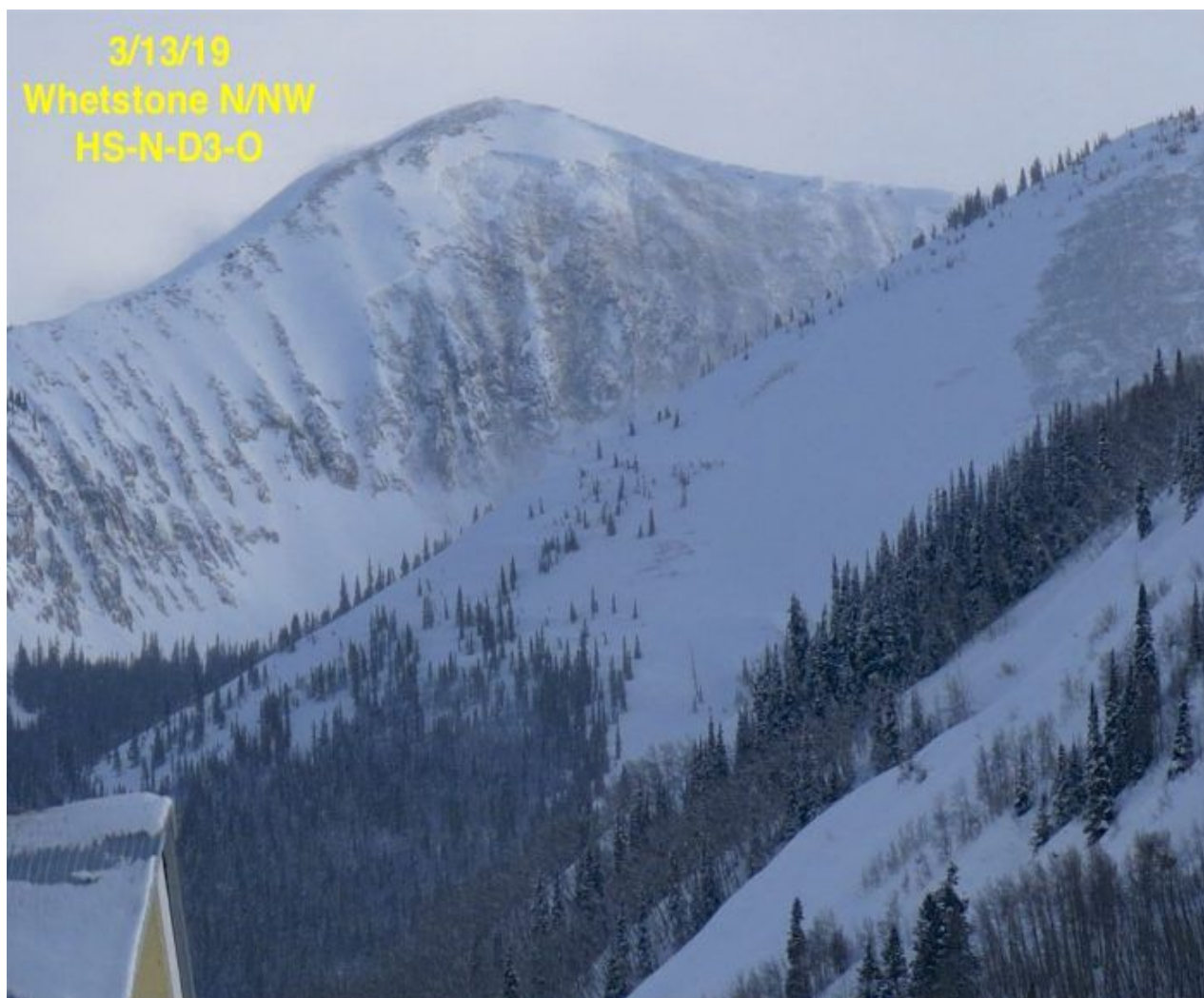
2/28/2019 Interface: The warmest temperatures of the season led to a widespread melt-freeze crust which got buried on 2/28. No faceting was seen yet at the Elkton Study Plot last week, however temperature gradients were very strong under this crust. During our historic “March Madness” loading event, many avalanches broke initially at this new/old interface however it is now under 4-6 ft of dense slab and while it is a smooth sliding surface, it does not appear that this will be a layer of concern moving forward. Recent tests such as this [Paradise Divide](#) ob documents this well.



**Gothic Mt. W-
WSW
HS-N-R3.5-D3.5-O
Ran midday 3/14**



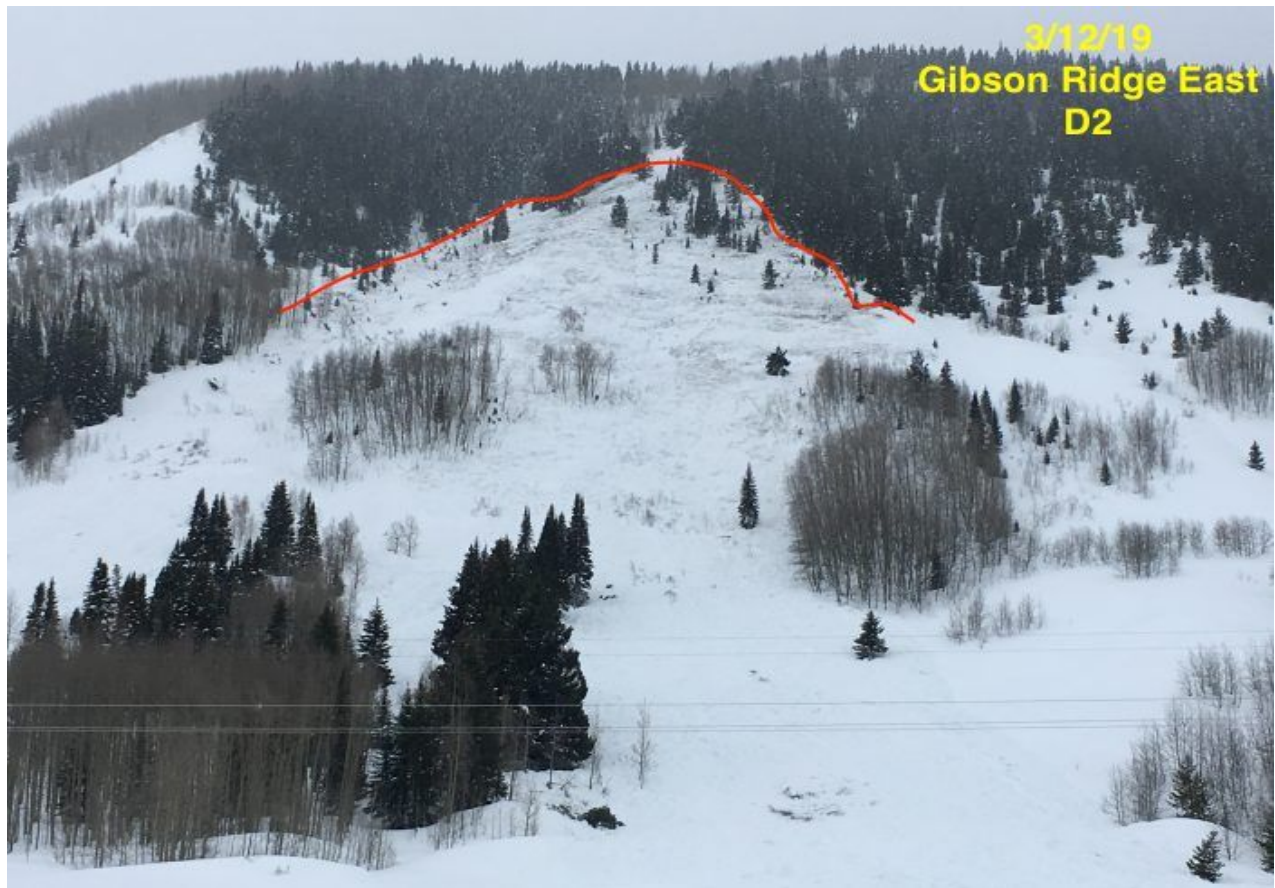
**3/13/19
Whetstone N/NW
HS-N-D3-O**

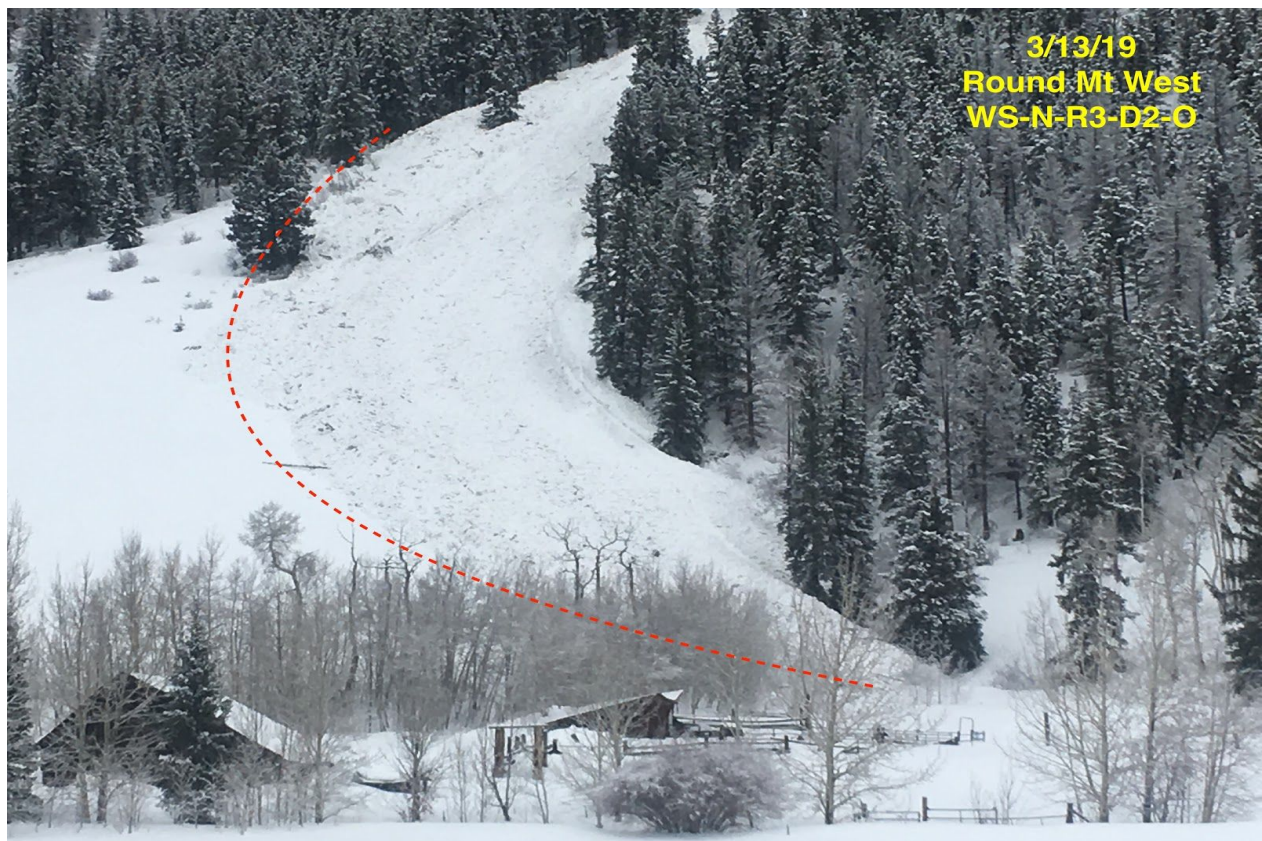


This week saw continued snowfall, rain and winds blowing from a variety of directions which kept the avalanches rolling through this period. Avalanches during this time ranged in size from D2-D3+ with very large avalanches continuing to fail naturally on a variety of aspects. Coming out of our major loading event we saw a very warm storm which produced rain at lower elevations on 3/12 and 3/13. This led to a couple suspected D2 wet slab avalanches below tree line south of Crested Butte on Gibson Ridge and Round Mountain.

As this event was happening, winds were blowing from the south and are likely a factor in the D3 Whetstone avalanche on 3/13. Winds then transitioned to North and Northeast for a few hours which likely contributed to cross-loading Gothic's West side leading to a D3+ avalanche on 3/14.

Recent activity has been breaking deeply and many times very close to the ground, releasing the entire snowpack making travel very tricky right now. With a thick and dense mid pack from "March Madness" and multiple big February storms providing a large and stiff slab over a variety of weaker layers from early in the season, it appears we have moved into a Deep Persistent Slab problem type. Shallower zones and windward terrain appear to be the prime suspects for very large to historic avalanches moving forward. As we introduce water and cornice failures to our snowpack, it is likely we may see natural slides continuing.





Incident, accidents, close calls

Unfortunately this week had two accidents involving roof avalanches after heavy snow and warm temperatures. On 3/8, a roof avalanche in Mt. Crested Butte buried 1 man for around 2 hours. He was able to maintain an airspace and when his wife notified authorities of his absence, first responders went to his last known location to find a large roof avalanche. Probing was successful in locating him and after excavation he was transported to the Gunnison Hospital where he is recovering.

On 3/9 a roof avalanche in CB South buried two men, one of which died in the accident. Details can be seen in this [Preliminary Report](#). This accident makes 3 full burials in 2 days from roof avalanches and highlights the unpredictable things that happen during historic weather events.

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

Rapid change is rarely good in nature and we are seeing this in the form of heavy snow, winds and warmth which is typical of spring weather in the Rockies. This season is not disappointing as we have had many large avalanche cycles and too many HIGH danger days to count on two hands as we move into a major transition stage for the snowpack when the weather finally warms. The graphic below has been a rare sight as the trend this next week will be warmer and dry.

