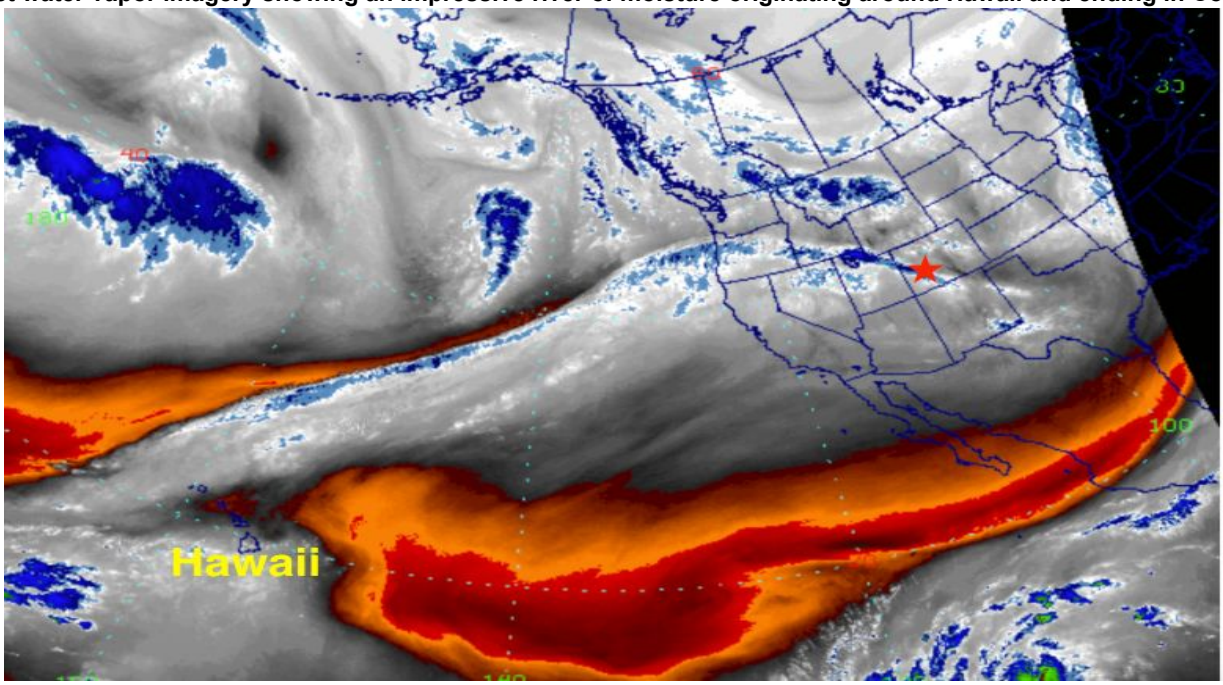
Backcountry Weekly Summary

CBAC
CBAVALANCHECENTER.ORG

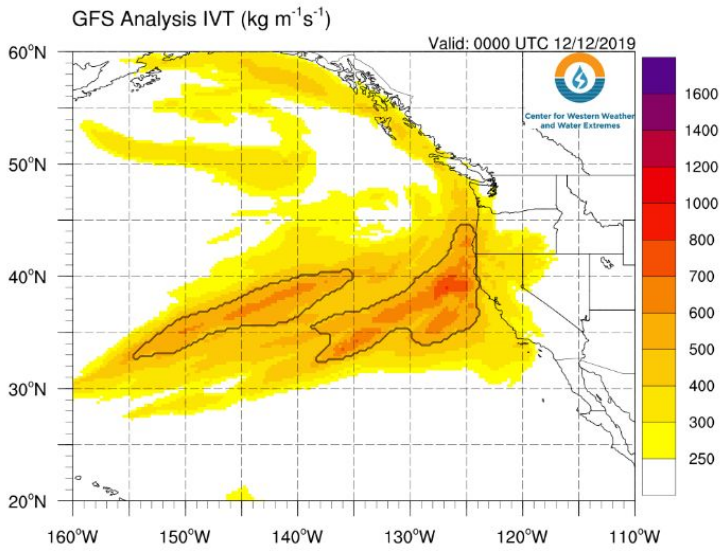
Staff:	Zach Kinler
Week and Year	December 13th-19th, 2019
Backcountry zone:	Crested Butte Area

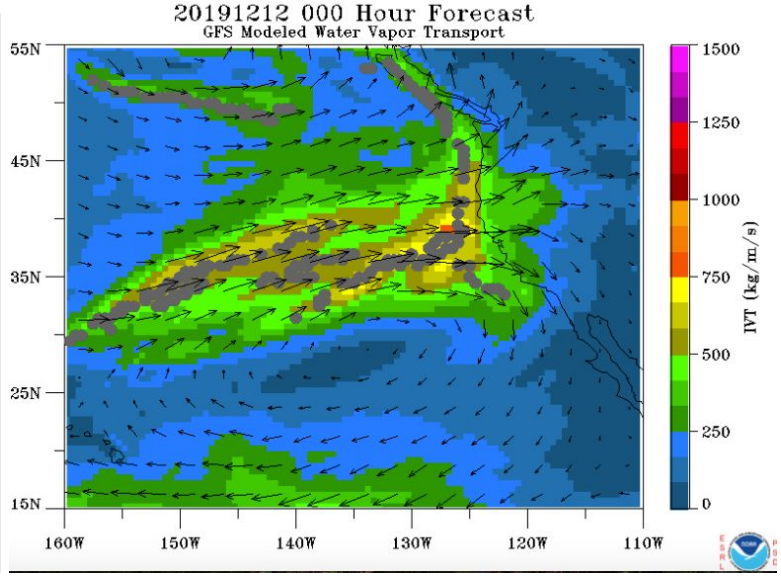
Notable Weather Events (snowfall, SWE, winds, temps, etc.)

GOES-West water vapor imagery showing an impressive river of moisture originating around Hawaii and ending in Colorado.



Vapor transport forecasts for the 12/12-12/15 AR event showing trajectory and strength of our first major river event of the season.





This period began with a multiple day cycle providing an extended period of light-moderate snowfall with embedded heavier showers. On 12/13 a 180 knot jet stream was efficiently transporting moisture in NW flow into our area. This moisture had origins in the Pacific near Hawaii marking our first Atmospheric River event of the season. With the strong jet stream came very strong winds with ridgeline speeds in the 40s and gusting into the 60s. Accumulations came overnight before a break in the action with snowfall beginning again around 20:00.

On 12/14,moderate snow fell through the night with the jet stream and moisture tap still in place. As the jet and the associated cold front pushed south, flow shifted to the WSW as the second wave of moisture and dynamics moved through. Again, moderate snow with heavier showers and strong winds in the 20s gusting into the 40s followed. This moisture rich Pacific air led to a warming trend starting around midnight before the front moved through. The jet stream finally shifted south of our area with snow winding down and winds began to decrease around 18:00.

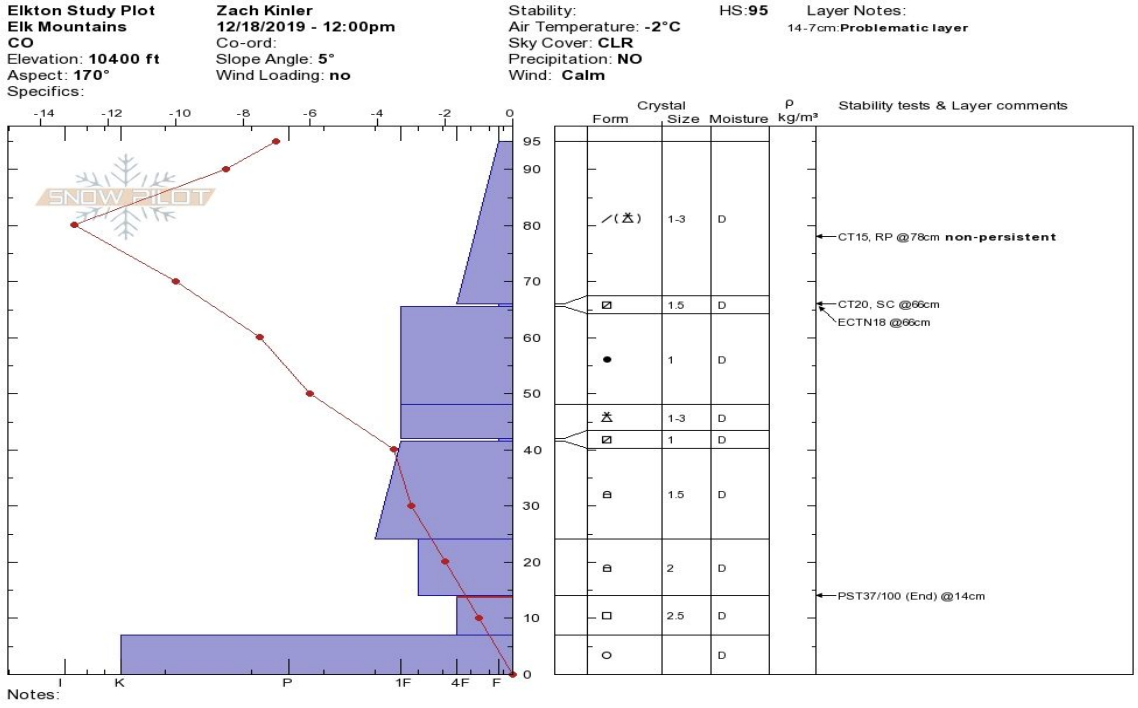
On 12/15, colder air filtered in with the mountain locations hanging in the single digits under broken skies and light NW breeze. Initially, visibility was good with a ceiling well above 14,000 ft however as the upper level trough responsible for the recent weather finally approached, clouds filled back in and the ceiling dropped to valley floors however no additional accumulations occurred.

Storm Totals 12/12-12/15

Schofield: 21” snow/ 2.5” SWE
Gothic: 20.5” snow/ 1.63” SWE
CBMR: ~15” snow(cam)
Butte: 12” snow/ 1.4” SWE
UT: 17” snow/ 1.3” SWE
Town of CB: ~12” snow(ob)

Following the storm on 12/16, skies were clear with a light North breeze. The recent cold air was well mixed with mountain locations in the negative single digits while the valleys remained above 0F in the single digits. On 12/17-12/19 a strong ridge of High pressure set up over the Great Basin leaving our area in cold NW flow. Clear skies and calm winds allowed valley temperatures to plummet into the -20s overnight while mountain locations above 12,000 ft remained in the +20s. This strong inversion remained in place during the daytime hours as cold air was anchored in place in the valley floors.

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 Paradise Divide Ob with facets and early stage Depth Hoar growing to 4mm underneath. This Kebler Pass 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 here. This Cement Creek Ob 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 natural avalanche ob from Kebler Pass area highlighting large, persistent slabs failing on this layer. A widespread natural avalanche cycle followed the 12/12 cycle with large avalanches breaking near the ground on this interface. This layer is now buried ~60-100 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 Photo and this Photo. A ski cut released a very small avalanche on this layer in this Ob, and time will tell if this layer remains active with additional loading. At the Elkton Study Plot 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 rider-triggered D2 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 ~50-90cm deep.

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 Pittsburgh Ob highlights this layer found in a shovel tilt test. This Anthracites observation has this layer ~30 cm as of 12/8 with cracking and failure observed. After the 12/8 cycle this layer is now ~ 30cm-50cm deep and continuing to cause failure as seen in this large and complex avalanche. On southerlies, this Paradise Divide ob shows this layer as a crust/facet combo which will need to be watched with future loading. This week, a skier-triggered avalanche in the Anthracites likely failed on this interface while a rash of persistent slab avalanches on southerly aspects failing mid-pack, points to this layer as the culprit. This layer is now buried ~40-80 cm

12/8/19 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. Last week at the Elkton Study Plot, this layer was 1.5 mm near surface facets with results on a shovel tilt test. It was buried ~15cm-30 cm. After the last cycle, this interface is now ~30-60 cm deep with no results this week at the Elkton Study Plot. Small 1 mm facets were observed hanging around this interface however its sensitivity is decreasing.

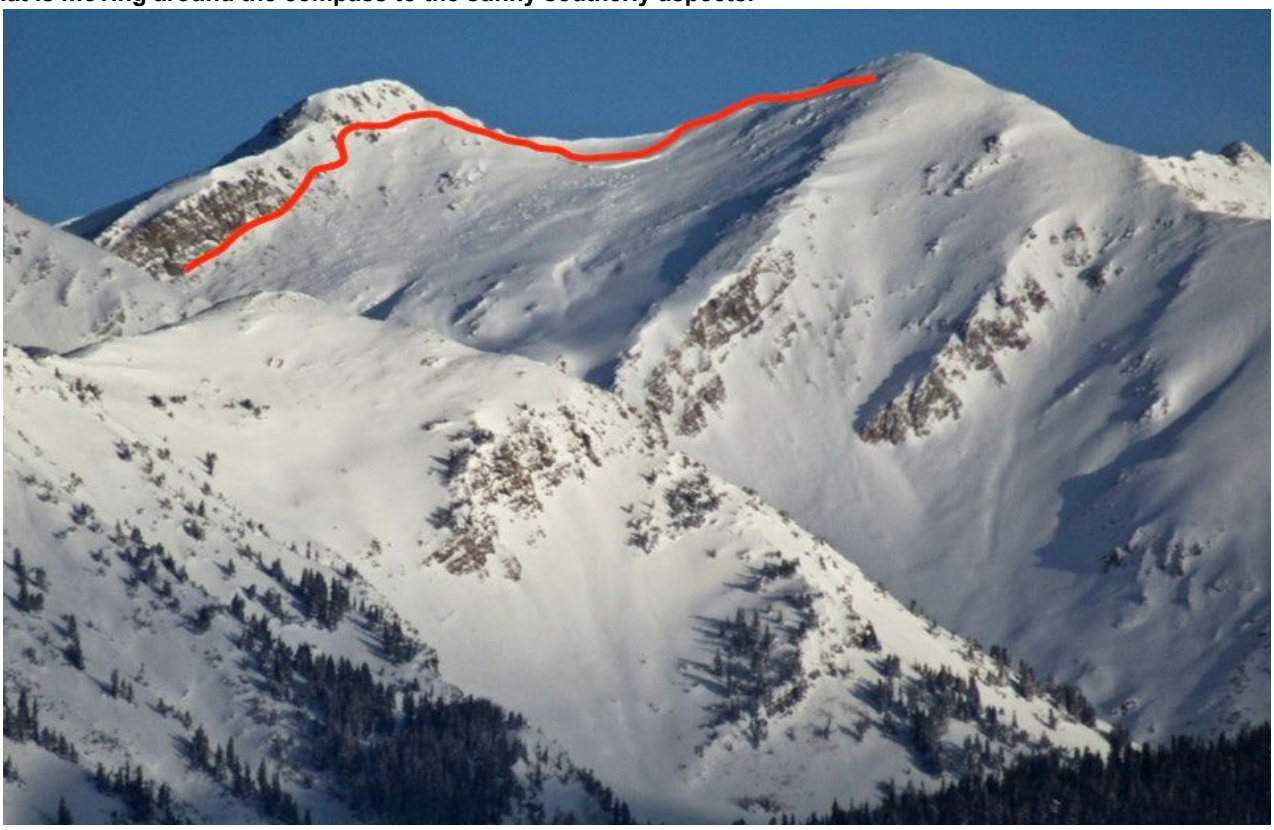
12/12/19 Interface: The most recent interface to join the list this week is the new/old interface which is now buried ~ 20-40 cm deep. At the Elkton Study Plot this week, 1.5 mm near surface facets were observed at this interface. Stability tests on this layer were CT 20, SC Q1 and ECTN18. The overlying slab is very soft and time will tell if this interface remains on the problem list.

Avalanches

A widespread natural avalanche cycle followed our first Atmospheric River event this week after 1.5”-2.5” of SWE fell accompanied by strong to extreme Westerly winds. This overloaded multiple weak layers throughout the snowpack including surface hoar and crust/facet combos from early December. On aspects from NW-N-E where these mid-pack weak layers overlay October snow(now Depth Hoar), avalanches were breaking at the ground regardless of where they initiated. This put the bullseye again on the wind drifted shady half of the compass where we saw many large D2-D2.5 avalanches. Sheltered slopes below treeline got in on the action as well as these areas held the weakest early season facets and Depth Hoar. Crust/facet combos formed on the southerlies in early December. These interfaces were finally overloaded by the recent cycle which led to our first major avalanche cycle on S and SE aspects near and above treeline. It appears the crusts were able to support a large load before failing

which created some of the largest avalanches of this cycle with several D2.5 size avalanches and our first reported D3 on a South aspect near Gothic. With a long duration loading event, the extent of the avalanche cycle is sometimes hidden, however as more obs come in, so does more evidence of recent avalanche activity. This was a widespread cycle of large to very large avalanche with our first HIGH danger day and Avalanche Warning.

This D3 avalanche on the "Camel Back" is the largest avalanche reported this winter and signals a persistent slab avalanche problem that is moving around the compass to the sunny southerly aspects.



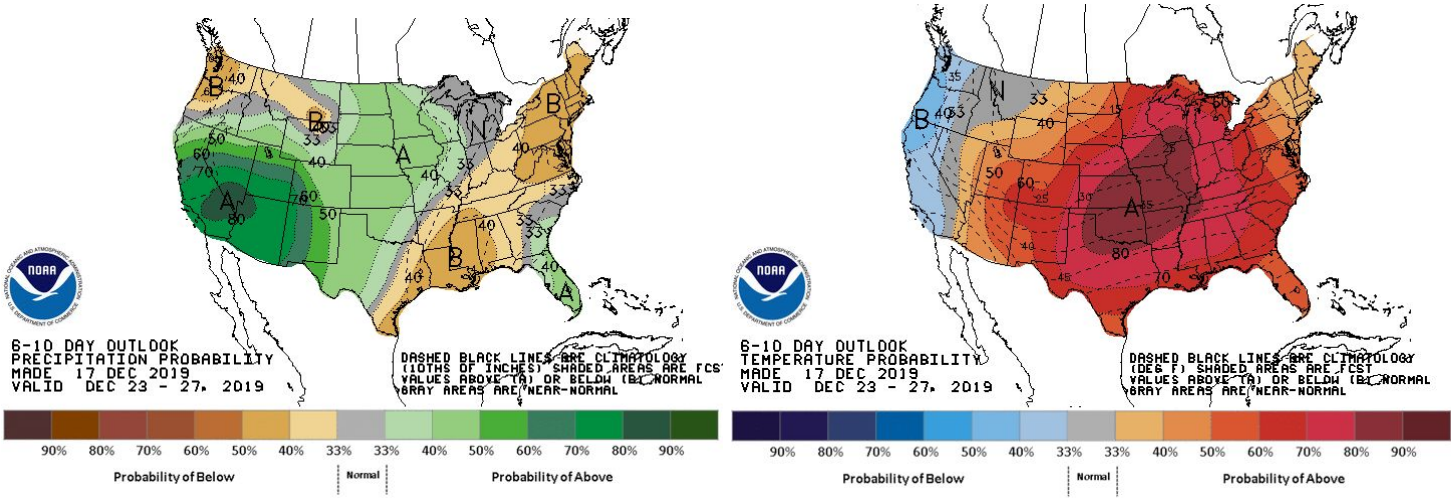
Another sunny side persistent slab avalanche. This D2 ran on the South face of Baldy on mid-pack weak layers.

The latest loading event brought the avalanches closer to town as seen here on the hillside near Meridian Lake. Distribution of avalanches encompassed all elevations and many aspects.

Incident, accidents, close calls

This week, there were no major incidents, accidents or close calls reported to the CBAC. Check out a report here and here for a few remotely triggered avalanches from our area.

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



This was an active week with a major storm cycle followed predictably by a major avalanche cycle. After drying out for a week or so under a large area of high pressure, a stormy pattern looks to return by the middle of the week as seen in the above 6-10 day forecast which is advertising above normal precip and above average temps. We will look forward to the possibility of moisture rich storms moving in from the SW over the Christmas Holiday.