



2019/2020 Forecaster Summary
By
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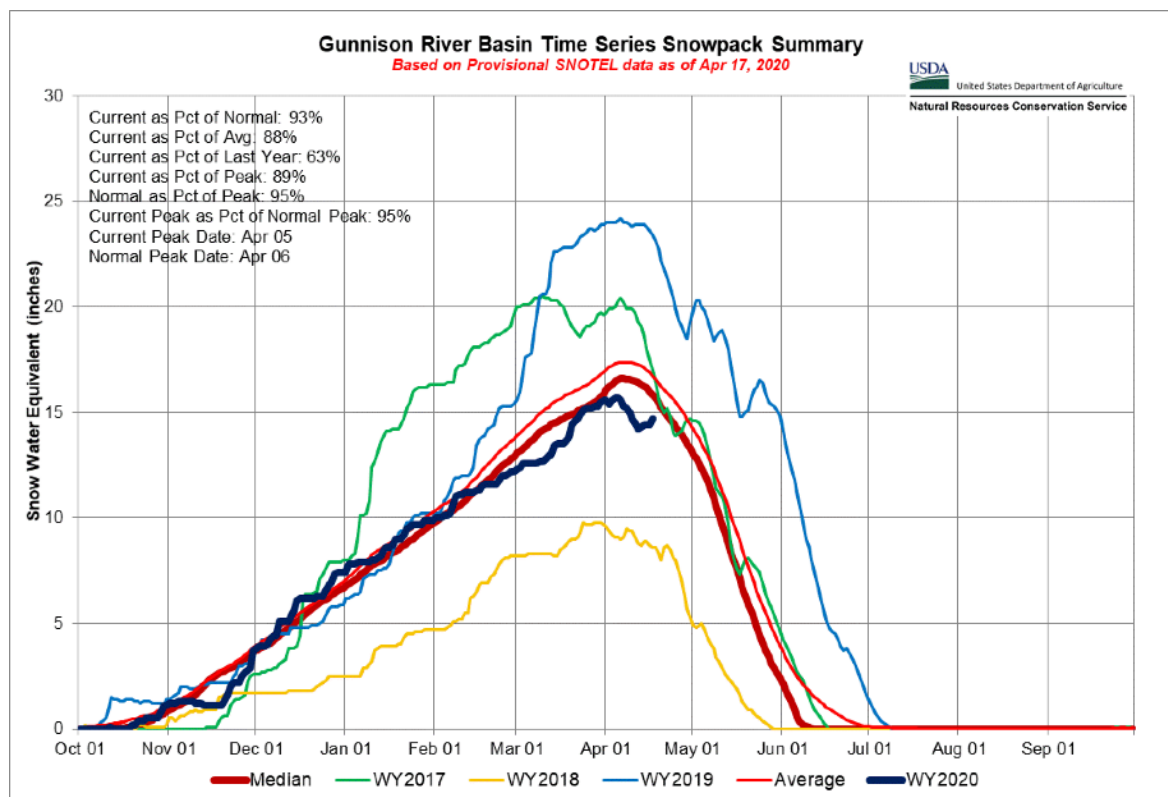


CBAC Operations

The Crested Butte Avalanche Center (CBAC) has been operating as a non-profit 501c3 avalanche center since 2002. This season the CBAC issued 145 weather and avalanche advisories, beginning November 27, 2019 and ending April 19, 2020. Additionally, before our daily forecast started, the CBAC posted a couple conditions updates to the homepage on our website, posted new observations, and sent weather/avalanche information out via social media. An all inclusive spring travel advice summary was posted on the website on April 20, 2020. As conditions warrant we may send a couple conditions updates out via social media and we continue to update the observations page on the website with anything that comes in.

The CBAC has a working staff of six people with Than Acuff as the Executive Director of the CBAC and Karen Williams as the Development Director. Evan Ross served as the full time lead forecaster with Eric Murrow as a full time forecaster, Ian Havlick as a part time forecaster and Zach Kinler working in a variety of roles including producing online weekly summaries, Elkton Snow Profiles, videos, and spring forecasting. The CBAC board of directors are (President) Keitha Kostyk, (Treasurer) Chad Berardo, Steve Banks, Chris Read, Ben Breslauer, Jim Duffy, John Dugenske and Seth Tucker.

Snow And Weather Summary



Let's start off using the graph above. This is a snow water equivalent graph for the Gunnison River Basin. It gives a rough estimate of the amount of water sitting across the area in the form

of snow. This graph further lets us compare the snowpack against the last several winters and the average of all the data.

A Classic Continental Snowpack, started right from the beginning. Just like normal. The first notable snow accumulations started off in late October. That was followed by a dry first half of November. During the dry period of November the snow melted off the sunny side of the compass and begin faceting on the northern half of the compass. That is the start of a weak foundation for the snowpack and what we see most winters. Snowstorms turned back on for late December as you can see with the spike in the graph. Unstable snow first developed on the northern half of the compass where slabs were developing over those early season facets.

The biggest spike in the graph was roughly from late November to the start of January. That is when we saw the best accumulating snowfall and a nice consistent increase in the snowpack. From January through the rest of the season we saw fairly constant snow and the snowpack increased near or just below average for that timeframe. By the time we got to the snowpacks peak on April 6th, we had slowly fallen below average. We were sitting in the 84% range of average on that date. Of interesting note, that peak snowpack was only 60% of last year's peak.

Billy Barr records weather information in Gothic. Here is a brief summary of his data on April 11th. "This winter's snow total is 41% below average, this is ranked 44th of the past 46 winters. A week ago this winter was at 39% below average". "This winter's snow water equivalent (SWE) = 16.55", 28% below average. A week ago this winter was at 25% below average".

Looking at the two forms of data. It is clear that the snow water equivalent roughly peaked 20 to 30% below average. At least it didn't feel that bad, and I think we were saved by fairly consistent snowfall keeping conditions somewhat fresh. We just didn't have the real big storms that some of the better winters typically have.

Notable Winter Storms And Events

This is a selection of the most notable weeks from Zack Kinler's weekly Summaries

November 29 to December 5th: This period included a major natural avalanche cycle and multiple backcountry riders becoming partially buried in avalanche events.

This period began with a Pacific NW closed low pressure system digging into the Great Basin. This system provided a surge of moisture aided by the subtropical jet as well as large-scale forcing and cold air behind the front. Moderate to strong winds with gusts over 70 mph accompanied this storm which initially blew from the South before transitioning to SW-W-NW. Cool, dry air filtered in behind this system and skies cleared on 11/30 with lows dropping below zero and highs in the teens.

12/4 was a transition day as a closed mid-level low moved onshore into Southern California before tracking west and opening up into a shortwave as it tracked across Colorado. Light south winds with gusts into the 20s initially gave way to moderate and strong westerly winds with gusts up to 40 mph once frontal passage occurred. This was not a particularly organized system

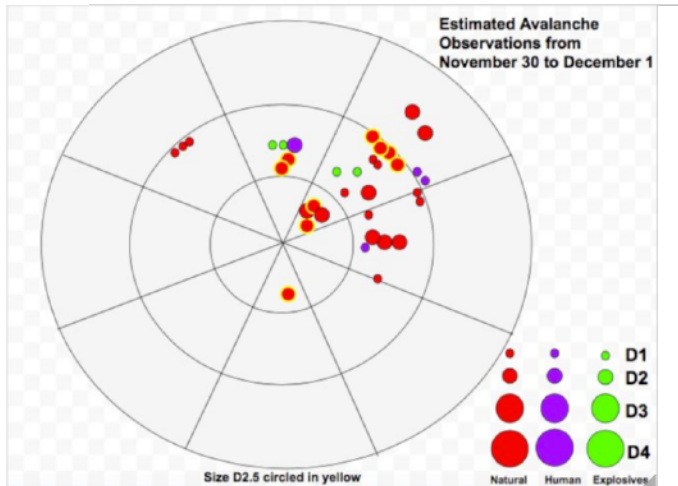
however, moisture, orographics, and cold air came together nicely to produce snow totals on the high end of the forecast during the day on 12/5.

Storm Totals 11/29-11/30

Schofield Snotel: 12" snow/1" SWE
 Gothic: 7.5" snow/ .61" SWE
 CBMR: 9" snow
 Butte Snotel: 7" snow/ .5" SWE
 Upper Taylor Snotel: 7" snow/ .5" SWE

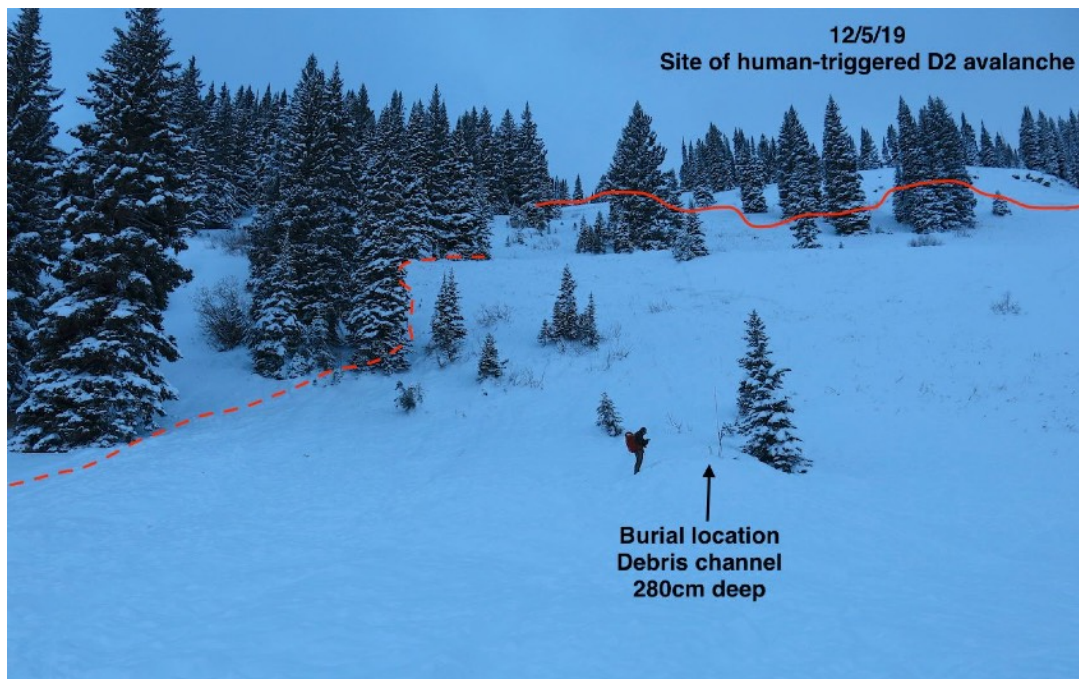
Storm Totals 12/5

Paradise Divide: 12" snow
 Schofield Snotel: 10" snow/ 1.0" SWE
 Gothic: 7" snow/ 0.5 SWE
 CBMR: 7" snow(estimated from cam)
 Butte Snotel: 7" snow/ 0.6" SWE
 Upper Taylor: 0.4" SWE



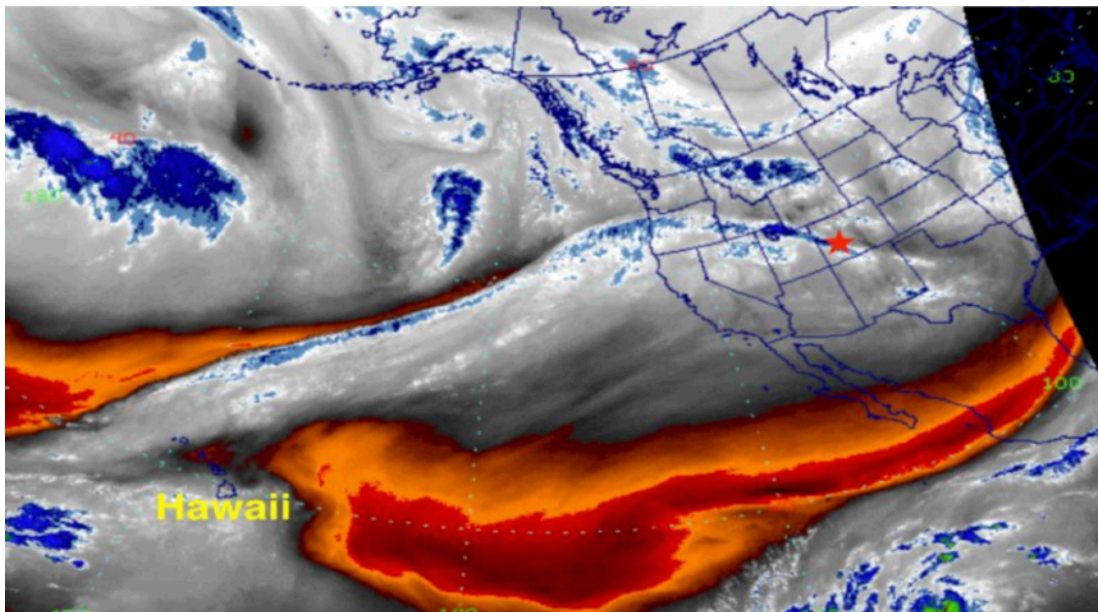
Large, widely propagating avalanches followed the 11/29-11/30 cycle with areas north and west of town in the bullseye

Since November 25th, there have been 8 people caught in avalanches and 7 partially buried. There have been almost 200 recorded avalanches with numerous human triggers. Early season snowfall lurks in the areas with the best coverage and riding conditions however this is where we have our first major Persistent slab problem.



On 12/5 a snowboarder triggered a large D2 avalanche which broke on old snow near the ground and led to a partial burial. The rider never lost his airway and was assisted by his partner. A Preliminary report can be seen [here](#). This was a large avalanche that broke ~100 ft wide and ran ~400 vertical feet carrying the victim with it in the main debris channel which stacked up to 280 cm at its deepest. This main channel was also where the victim was partially buried. We at the CBAC are grateful there were no injuries and will take this opportunity to learn while moving forward.

December 13th-19th: Our first atmospheric river event of the winter led to our largest avalanche cycle to this point 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.

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

Town of CB: ~12" snow(ob)

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.

January 17-23: This was a wild week with snow, wind, and a streak of human-triggered avalanches.

This period began on 1/17 with a vigorous upper level trough moving in from the southwest US. Strong southerly flow brought the first wave of moisture followed by colder west and northwest flow after frontal passage. Light south winds ramped up quickly by afternoon sustaining 20-30

mph with gusting to 80 mph at both Cinnamon and Scarps Ridge. Highs temps in the teens and twenties early with temps dropping through the afternoon.

1/17-1/18 Snow Totals

Irwin: 1.4"SWE/ 15" snow

Schofield Snotel: 0.9"SWE/ 13" snow

Gothic: 0.48"SWE/ 6.5" snow

Upper Taylor Snotel: 0.6"SWE/ 9" snow

CBMR: 8"(cam)

On 1/19, skies cleared with a cold start in the valleys as strong inversions were in place. Valley locations were well into the -20s while mountain locations remained around +20F. Mountains saw warming under strong solar while the inversion held strong below 9,000'. 1/21 saw SW winds and a warmer air-mass scrubbing the inversion out with valley temps warming and mountain temps remaining steady overnight. West to northwest winds continued to increase on 1/22 as one shortwave departed and another one dropped in from the NW. Winds around 15-20 mph gusting into the 30s and light to moderate snowfall favoring the Kebler Pass area we observed. A favorable NW jet stream and additional lower level moisture kept the orographic snow machine going into the overnight hours and into 1/23.

1/21-1/23 Storm Totals

Irwin: 1.8"SWE/ 25.5" snow

Schofield Snotel: 0.7"SWE/~10" snow

Gothic: 0.47"SWE/ 6" snow

Upper Taylor Snotel: 0.3"SWE/ 5" snow

CBMR: 5" snow(cam)

Avalanches

This was an active week of avalanches following another two rounds of snow and wind. Avalanches during this time were confined to drifted terrain near and above tree line generally from E-S. In areas like this, incremental snowfall has built slabs over multiple weak layers in the upper snowpack and natural avalanches are breaking during peak instability while human triggering similar terrain has remained possible after loading has ended. Avalanches during this time ranged from D1-D2.5 with a couple breaking into weak layers near the ground and one large repeater slide on the east face of Peeler.



Large avalanche on Peeler Pk. This is the largest avalanche reported this week and this path has slid previously this winter.

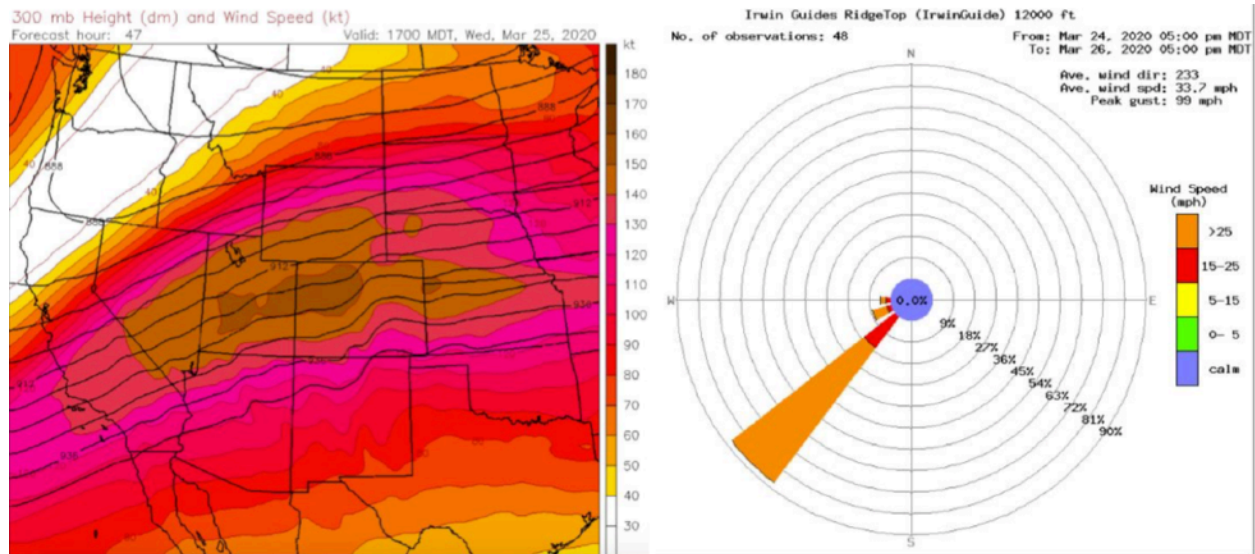
Incident, accidents, close calls

This week there were 4 human-triggered avalanches in a period of four days. Two of these were triggered by snowmobile/snowbike and the other two by skiers. Wind-loaded terrain features were common in all of these incidents with E-SE aspects near and above treeline common to all. The most dangerous incident occurred on 1/19 in Red Lady bowl when a solo skier dropped off the looker's right ridge and triggered a large persistent slab avalanche which failed on a fragile crust/facet combo which formed in late December. For a couple weeks now, incremental loading from westerly winds has built a slab on this interface and others in the upper snowpack. This avalanche stepped down to weak layers near the ground. The skier was hit from behind unaware that he had triggered the slide. This is a very close call with a happy ending and lots to learn.



This snowmobile triggered avalanche is on an East aspect near tree line with previous drifting.

March 20-26: An extreme wind event initiated our most destructive avalanche cycle of the season with mayhem in certain alpine areas.



300 mb wind chart and the 48 hour wind rose for Scarp Ridge showing impressive SW winds as a result of a 160 knot jet streak moving directly over Colorado. This was a multi-day wind event producing sustained winds of 50+ mph and gusts near 100mph.

From 3/20 to 3/24, multiple short waves passed through. These small storms westerly winds steady in the 10 to 30 mph range and each produced several inches of snow. Total snow accumulations during this period were in the 6 to 12 inch range for an average.

On 3/25 the large trough responsible for recent shortwaves dug south along the CA coast bringing the SW oriented jet stream directly overhead. Wind ramped up from the consistent 10-20 mph the previous day to 20-35 mph with gusts increasing to 50-80 mph, indicating the approaching jet max. Winds at Cinnamon Mt were more southerly averaging SSW(195) while Scarp Ridge was an incredibly consistent SW(223). Winds below tree line remained fairly calm. Mostly cloudy skies with carbon copy temps from the previous day with freezing level around 11K was observed. The wind event ramped with even more on 3/26 with the jet max overhead. Cinnamon Mt had sustained winds at 30-40 mph and Scarp Ridge was at 40-50 mph. Between 04:00 and 07:00 sustained winds averaged 55 mph. Max Gusts were also impressive with Scarp Ridge at 99 mph and 82 mph on Cinnamon Mt. Skies were partly cloudy with slightly warmer temps than the previous day. Freezing level was around 11,500'. As of 18:00, winds were sustained at 25-35 mph and gusting 50-60 mph, SSW(195) on Cinnamon and SW(226) on Scarp Ridge.

Avalanches

This period saw our most destructive avalanche cycle of the season after heavy snow and SW winds built slabs over recently buried crust/facet combinations in the upper snowpack. A shallower Persistent Slab avalanche problem developed initially on buried crust/facet combinations in the upper snowpack around the 3/18 interface. The first large to very large

avalanches began breaking on 3/22 as smaller Wind Slabs began stepping down to the 3/18 interface as seen on Gothic Mt. SW winds increased on 3/23 as large cornices began falling, triggering this Deep Persistent Slab avalanche on Whetstone. This somewhat surprising avalanche proved to be the beginning of an impressive cycle of similar avalanches reaching D3 in size, triggered by large Cornice or Wind Slab failure. These avalanches were very consistently breaking on slopes facing E-N above tree line where the bullseye for loading was pointed from extreme SW winds.

A combination of factors likely led to this event. Early season Persistent weak layers buried under hard slabs had become unreactive given a lack of loading from a season of incremental events and increasing snowpack depth. Rounding and sintering of these weak layers had reduced sensitivity however these grains remained weaker relative to the slab above. Recent warming likely softened large cornices that have been looming on these aspects throughout the season without causing failure. Additional loading from the wind event this week caused these cornices to grow even larger and eventually break. This provided the large triggers needed to awaken the deeply buried weak layers as some cornices further triggered smaller slabs in the upper snowpack which were able to step down to the ground.

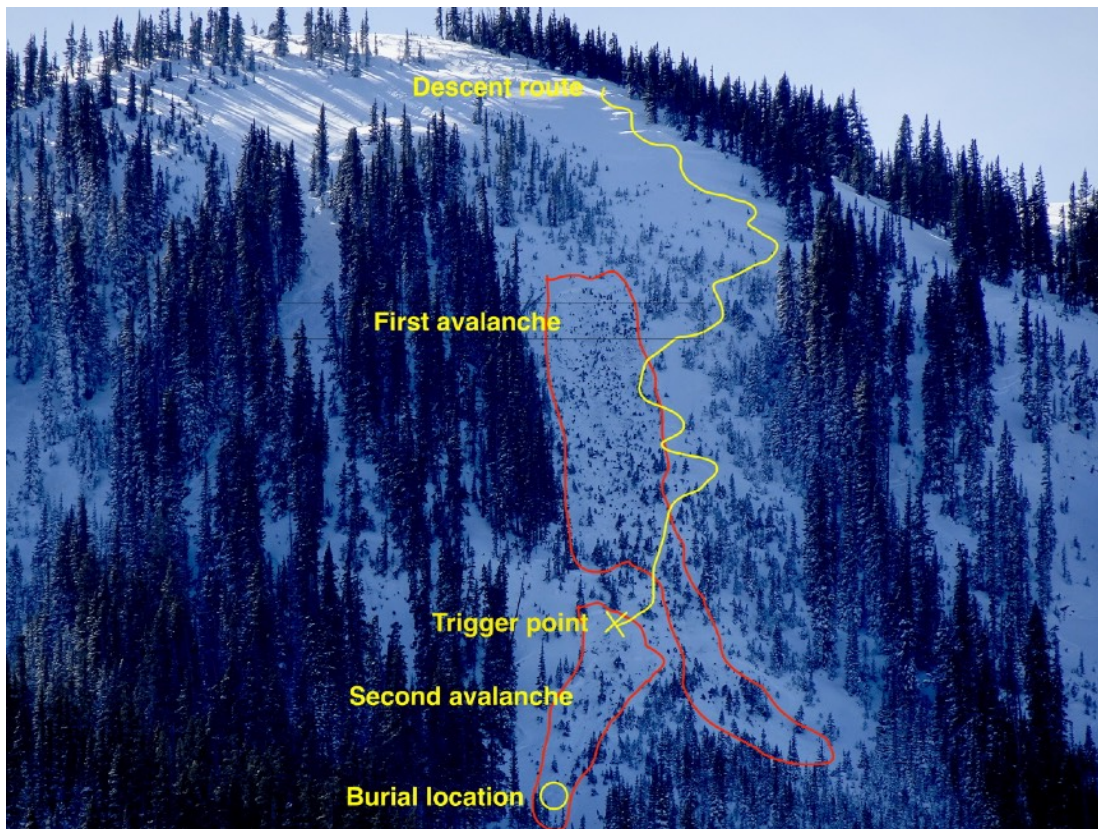


Whetstone M Face. Cornice Triggered Deep Slab. 3/24

Incidents

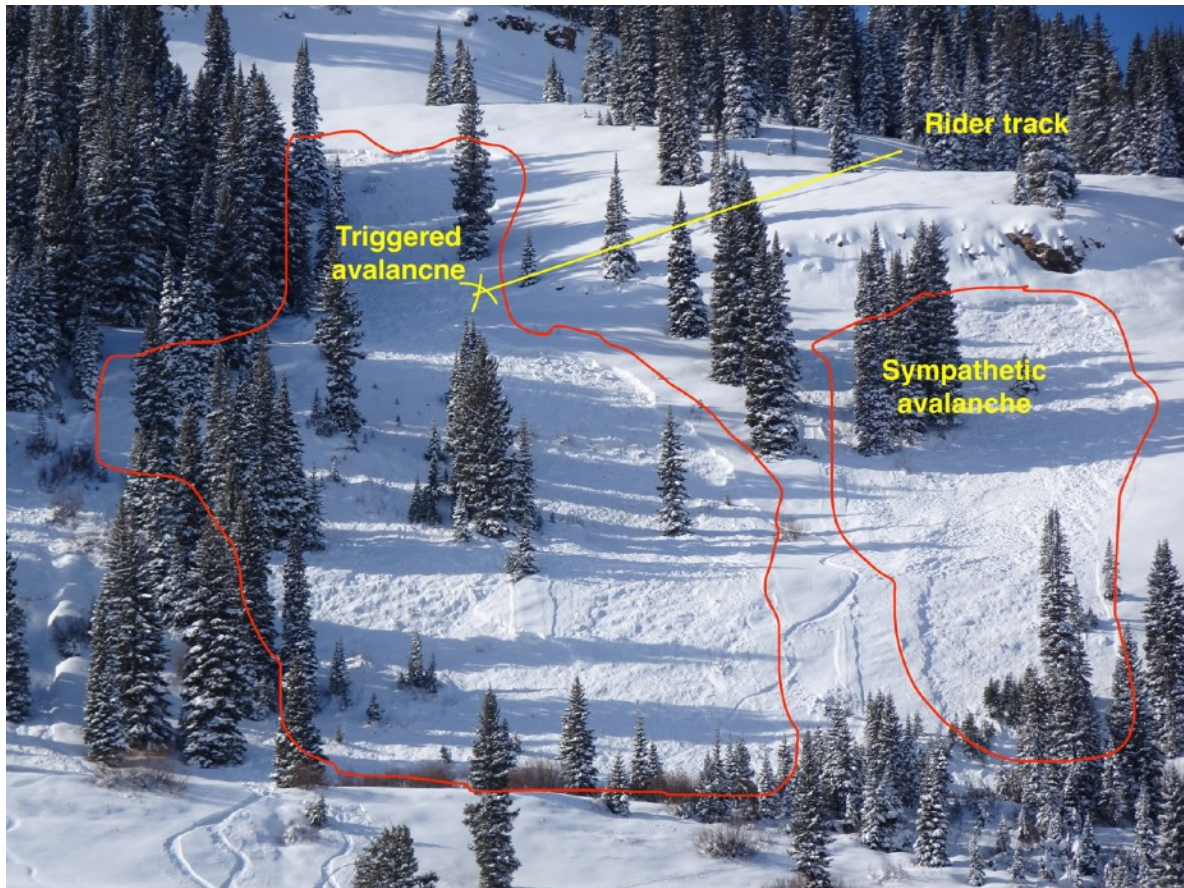
The CBAC received reports for a number of avalanche incidents this past winter, but thankfully, none of these accidents resulted in a fatality or serious injury. CBAC staff investigated 4 of these incidents over the course of the winter. Site visits were conducted the day of or the day after the incidents occurred.

The first incident occurred on December 1st in the Kebler Pass area. A solo party triggered several avalanches in a run called “Big Chute” located in the Anthracite Range and was caught, carried, and partially buried. The individual was able to self extricate out of the debris in approximately 20 minutes and did not sustain any significant injuries. A full investigation was completed the following day in conjunction with the CAIC which can be found [here](#). The avalanche was classified as a Persistent Slab.



Solo-rider triggered avalanche with partial burial and self-rescue. Big Chute (Anthracites), 12/1/19.

Then on December 5th, a stormy day, a snowboarder triggered and was caught, carried, and partially buried in an avalanche in a piece of terrain called “Cabin Shot” immediately above the townsite of Pittsburg. The triggered avalanche was a Persistent Slab. The individual was partially buried and was excavated by a touring partner. Thankfully, no injuries were reported. CBAC staff were notified of the incident shortly after it occurred which allowed forecasters to make a site visit the same day. The site visit observation can be found [here](#).



Snowboarder-triggered avalanche and partial burial in the “Cabin Shot” above Pittsburg, 12/5/2019

Another close-call came on January 19th when a solo-skier triggered a large Persistent Slab avalanche in Red Lady Bowl on Mount Emmons. This avalanche was witnessed by several people in town and was almost immediately reported to Crested Butte Search and Rescue and CBAC. This ‘close call’ had a positive outcome with the individual able to self-excavate and egress back to the trailhead without significant injury. This was the second solo-traveler, partial burial incident reported this winter. The lookers left portion of this bowl, out of sight in photo, had descent tracks in it previously, this day, and the day following the accident without other triggered avalanches. An investigation into the accident was performed by the CBAC and CAIC on January 20th. Additional information can be found [here](#).



Solo-skier triggered Persistent Slab avalanche in Red Lady Bowl on Mount Emmons, 1/19/2020

The final incident of the winter for the Crested Butte area came on March 3rd. An observation came to the CBAC from a resident of Meridian Lake development with a photo that showed a solo ski track entering an avalanche above Long Lake. The terrain shape did not allow a view of the debris in the photo, so it was not possible to identify if the person who triggered the avalanche was safe. CBAC chose to visit the site shortly after receiving the observation to look at the debris to confirm nobody was buried or injured. Thankfully, a small hole in the debris and solo track leaving the debris confirmed the individual that triggered the avalanche was able to self rescue. CBAC contacted members of Crested Butte Search and Rescue after receiving the observation and prior to checking out the debris pile. Debris piled up deeply on the abrupt transition to Long Lake and broke through the ice allowing water to fill the hole where the subject was partially buried. You can see more in the observation from the site visit [here](#).

It is interesting that three of the four partial burials were of solo backcountry travelers. There were numerous other human-triggered avalanches over the winter that did not involve people getting buried or hurt. The CBAC appreciates the willingness of the community to share near-misses and accidents as it provides a learning tool from others.



Meridian Lake Accident 3/3

Media

The CBAC website (www.cbavalanchecenter.org) is our primary method of communicating avalanche, snowpack and weather information with the public. Total viewership for the website declined over the past few years. This decline was likely due the “average” nature of snowfall this past winter and by the fact that there were no fatalities or injuries associated with avalanches this winter. The website had 105,805 page views and 55,044 sessions this winter. Around 55% of these users are utilizing mobile devices to view the forecast. Approximately 58% of users are from the Gunnison Valley while the substantial other portions comes from Denver and the front range communities of Colorado. The CBAC, in addition to website products, distributes an email every morning that reaches more than 400 people. CBAC forecasters prepare a morning radio report each day and supply it the local radio stations KBUT and KAYV for airplay. A very basic report is updated to CBTV-10 each day as well. Forecasters also contributed several Backcountry Notes articles that are printed in the Crested Butte News paper.

The CBAC continues to utilize social media to help further distribute information. Each day posts are made to Instagram and Facebook to reach a wider audience and make it as easy as possible for users to get useful information about avalanche conditions in the Crested Butte area. CBAC published 140 Instagram posts and 164 posts to Facebook (through 4/15). The amount of viewership and engagement continues to grow each season; social media has allowed the CBAC to find more avenues to communicate avalanche messaging to the public. Throughout the

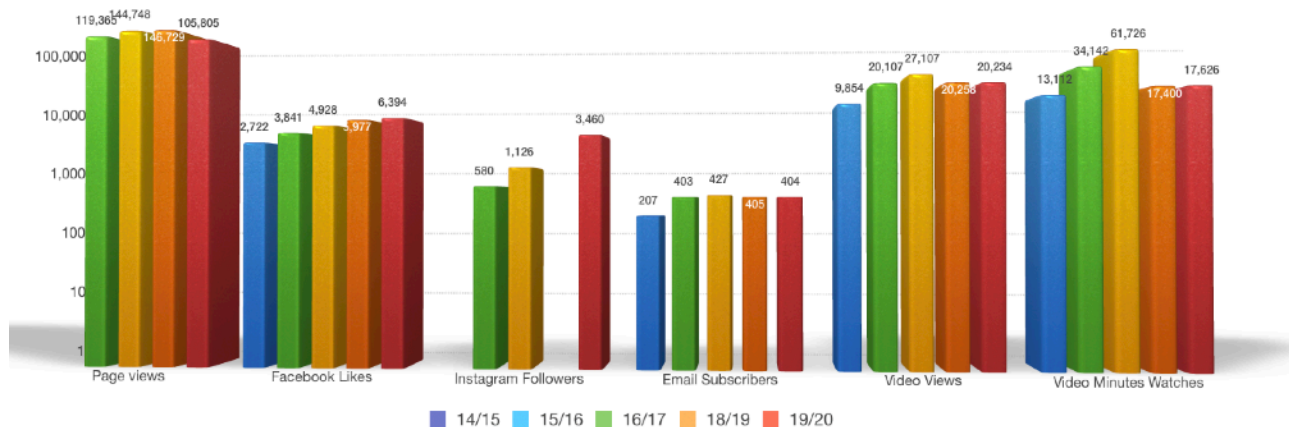
winter, informational videos are published and shared on social media as well. The CBAC produced 19 videos this winter and distributed them on Facebook and YouTube.

The CBAC was also involved in two additional media related projects over the past two seasons. In March of 2019, the CBAC, Matchstick Productions, and the North Face shot an avalanche educational video in Crested Butte. This video was released to the public in February of 2020 and received wide circulation on the internet. Additionally, in January of 2020, the CBAC assisted NatGeo with production for one of their television shows that was partially produced in Gothic. Two CBAC forecasters spent nearly a week with the NatGeo crew at Irwin and Gothic.

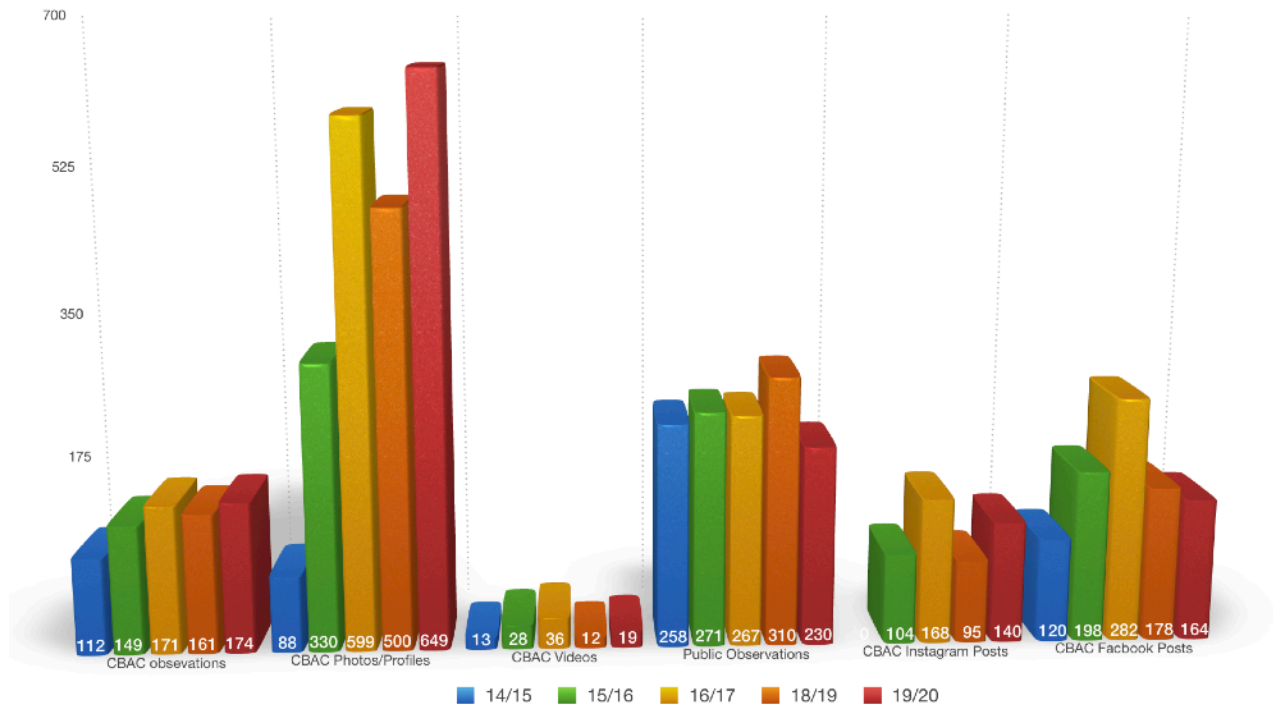
CBAC Usage statistics

CATEGORY	PAGE VIEWS	FACEBOOK LIKES	INSTAGRAM FOLLOWERS	EMAIL SUBSCRIBERS	VIDEO VIEWS	VIDEO MINUTES WATCHES
14/15	No data	2722	0	207	9854	13112
15/16	119385	3841	580	403	20107	34142
16/17	144748	4928	1126	427	27107	61726
18/19	146729	5977	No data	405	20258	17400
19/20	105805	6394	3460	404	20234	17826

CBAC Usage Statistics



Data Collection and Sharing





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