



2020/12/15 - Colorado - Snodgrass Mountain

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Avalanche Details

- **Location:** Snodgrass Mountain
- **State:** Colorado
- **Date:** 2020/12/15
- **Time:** 12:00 AM (Estimated)
- **Summary Description:** 1 backcountry snowboarder caught and injured
- **Primary Activity:** Backcountry Tourer
- **Primary Travel Mode:** Snowboard
- **Location Setting:** Backcountry

Number	Avalanche	Site
<ul style="list-style-type: none"> • Caught: 1 • Partially Buried, Non-Critical: 0 • Partially Buried, Critical: 0 • Fully Buried: 0 • Injured: 1 • Killed: 0 	<ul style="list-style-type: none"> • Type: SS • Trigger: AR - Snowboarder • Trigger (subcode): u - An unintentional release • Size - Relative to Path: R2 • Size - Destructive Force: D2 • Sliding Surface: O - Within Old Snow 	<ul style="list-style-type: none"> • Slope Aspect: NE • Site Elevation: 10000 ft • Slope Angle: 42 ° • Slope Characteristic: Planar Slope

Avalanche Comments

This was a soft slab avalanche unintentionally triggered by a backcountry snowboarder (Rider 1). The avalanche was small relative to the avalanche path and large enough to bury, injure, or kill a person. The avalanche broke on a layer of faceted snow capped by a thin layer of surface hoar (SS-ARu-R2D2-O). The avalanche released broadly, about 300 feet across the full width of this small avalanche path. The extent of propagation for such a soft slab hints at the very weak nature of the weak snow below the slab. The slab broke around 14 to 16 inches deep and was relatively soft (4-Finger on the hand-harness scale). As the avalanche ran it scoured most of the weak snow down to a buried sun crust that became the bed surface. Debris piled up to three feet deep. The avalanche occurred on a very steep (42 to 49 degree), northeast facing slope below treeline.

Backcountry Avalanche Forecast

The Colorado Avalanche Information Center's (CAIC) Gunnison zone rated the avalanche danger as Considerable (Level 3) near and above treeline, and Moderate (Level 2) below treeline. The forecast listed Persistent Slab avalanches as the primary problem at all elevations on west through north to southeast-facing slopes. The likelihood of triggering was Likely and the potential size was Small to Large (up to D2). The summary statement read:

Snowfall and strong winds have created layers of dense snow several feet thick, resting above weak snow. Conditions are most dangerous in the western side of the zone where the weekend snowfall was greatest. Avalanches could break several feet deep on slopes that face northwest to north through southeast. You can trigger avalanches from a distance, so pay attention to slopes above or adjacent to the one you are traveling on. You will find the safest conditions in wind-sheltered terrain or low angled slopes.

Weather Summary

Winter started slowly with four small storms between November 8 and 24. Snowfall totaled 29 inches measured at the Rocky Mountain Biological Laboratory (RMBL, 1 mile north at an elevation of 9500 feet). Cool, clear weather allowed strong valley inversions to develop between November 25 and December 10. Nighttime temperatures consistently dropped to near or below zero degrees Fahrenheit, with daytime highs near freezing.

Light snow fell between December 10 and 14, with a 4-day snowfall total of 22 inches and 1.5 inches of snow water equivalent (SWE) measured at the RMBL. The weather began to clear on December 15, with broken skies and light northwest winds.

Snowpack Summary

The snowpack at the avalanche site was two to two and a half feet deep. The avalanche started in a clearing surrounded by dense forest. Investigators found no evidence of prior drifted snow or wind effects. The upper snowpack was a soft layer of settled storm snow just over a foot thick. The lower snowpack consisted entirely of faceted snow, with the weakest snow just below the storm snow. The faceted snow developed during the late November and early December dry, cold weather. The snowpack surface was cohesionless prior to the December 10 snowfall. Backcountry travellers could easily trigger small Loose Dry avalanches on similar slopes. A layer faceted snow uniformly covered most northwest through north to east-facing slopes in the area.

The CAIC recorded 186 avalanches in the Gunnison zone between December 10 and 14. Seventeen of the avalanches were triggered by people on below treeline, northeast-facing slopes similar to the accident slope. In this same time frame on the north side of Snodgrass Mountain, observers had reported 20 natural and 3 human triggered avalanches. The snowpack was producing mostly small avalanches, but they were easy to trigger.

Events Leading to the Avalanche

Rider 1 and Skier 2 were married and Crested Butte residents. Midday on December 15 they left for a short ski tour. Rider 1 traveled on a splitboard, while Skier 2 was on lightweight touring skis. They planned to ski up and descend the Snodgrass road in time to pick their children up from school. Since their plan was to follow a snow-covered road with no exposure to avalanche terrain and they hoped to travel quickly, they brought light packs with only water, snacks and a spare layer. They chose not to bring their avalanche rescue equipment.

At the top of the road they changed plans and decided to descend to the north, figuring they could return along the Gothic road in time. Both recognized they were ill equipped for travel in avalanche terrain. From near the summit of Snodgrass Mountain, they descended a steep, forested slope east of the area locally referred to as First Bowl. The terrain grew steeper and rockier. Travel through the weak, faceted snowpack was difficult and they hit many rocks and stumps. They began to hurry, worried they would be late to pick up their kids.

They descended about 1000 vertical feet and arrived at the top of an open slope around 10,000 feet in elevation. Skier 2 waited and watched while Rider 1 descended first. He made one turn and the slope avalanched. He was pulled into the flowing snow. Skier 2 quickly lost sight of Rider 1 in a cloud of snow.

Accident Summary

The avalanche flowed through a band of small trees. Rider 1 was slammed into a four to five inch diameter tree. The impact broke his leg, but his snowboard and binding remained attached. Rider 1 was wrapped around a tree, unburied, alert, and injured when the avalanche stopped.

Rescue Summary

Skier 2 followed her husband's track onto the bed surface of the avalanche. Carefully she switchbacked down the "punchy and crusty" bed surface. Hoping to not descend below Rider 1, she moved slowly checking to see if the avalanche had pinned him around trees. Once Skier 2 heard him call out she skied straight to his position lower on the slope. Rider 1 was bleeding significantly and unable to walk. Despite poor cell coverage, Skier 2 was able to place a call to 911 at 2:26 PM.

Search and Rescue teams and a medical helicopter reached Rider 1 around 3:30 PM. The helicopter was able to land near the toe of the avalanche. Crews loaded Rider 1 into the helicopter and it departed around 4:00 PM. Personnel from Crested Butte

Mountain Rescue, Care Flight, and the CAIC were involved with the rescue.

Comments

The couple hopes sharing their experience might help others avoid a similar situation in the future.

They made a last-minute decision to enter avalanche terrain without a well-formed plan or detailed knowledge of the terrain. Rider 1 had ridden down the north side of Snodgrass three times previously, while Skier 2 had not. A friend had travelled off the north side of the mountain the day prior and reported great conditions. The lure of a fun-filled powder run was much stronger than their initial plan to descend the Snodgrass road.

After a few minutes of descending they recognized that they had underestimated the steepness and complexity of the terrain. Travel was slow and challenging. They began to feel scared, and worried they would not return in time to pick up their children from school. Reflecting afterwards, they described not knowing how to fix the situation they had created once they recognized the danger posed by the terrain they entered. Turning around and skinning to the ridge did not occur to them at the time, but it might have been the best solution in retrospect.

They chose to enter avalanche terrain without appropriate rescue equipment. Since Rider 1 was not buried in the avalanche, they were very lucky that getting caught in an avalanche did not have much worse consequences. This event serves as a great reminder to always carry avalanche rescue equipment in the winter backcountry.

Media

Images

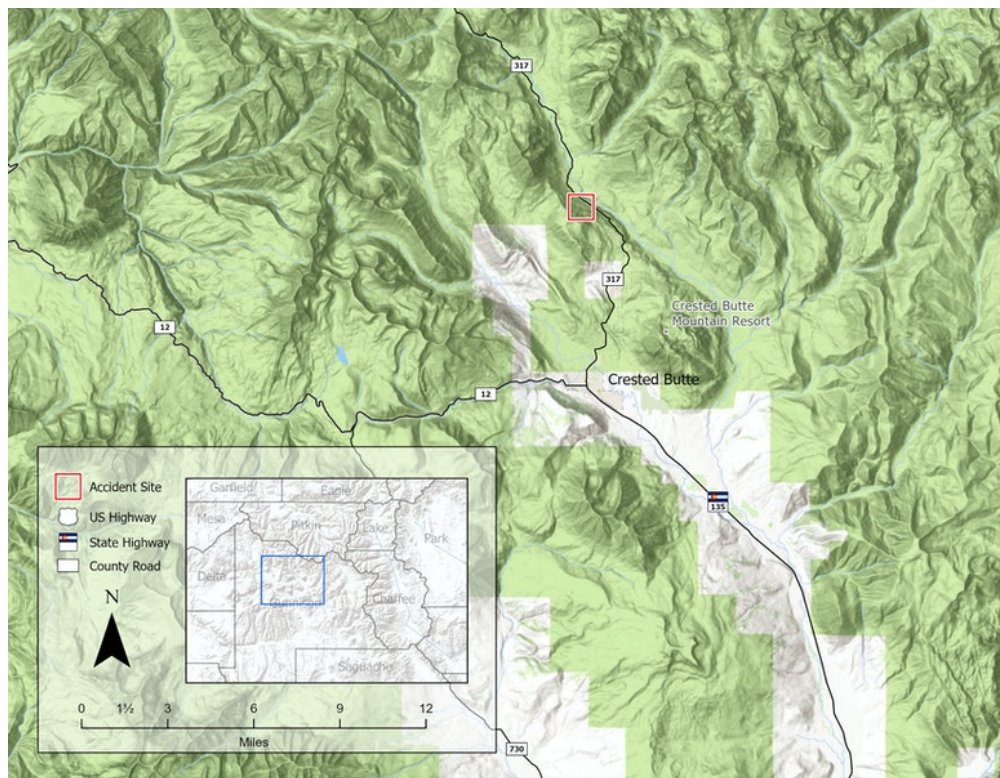


Figure 1: A map of the area around the town of Crested Butte. The accident site is marked by the red box.

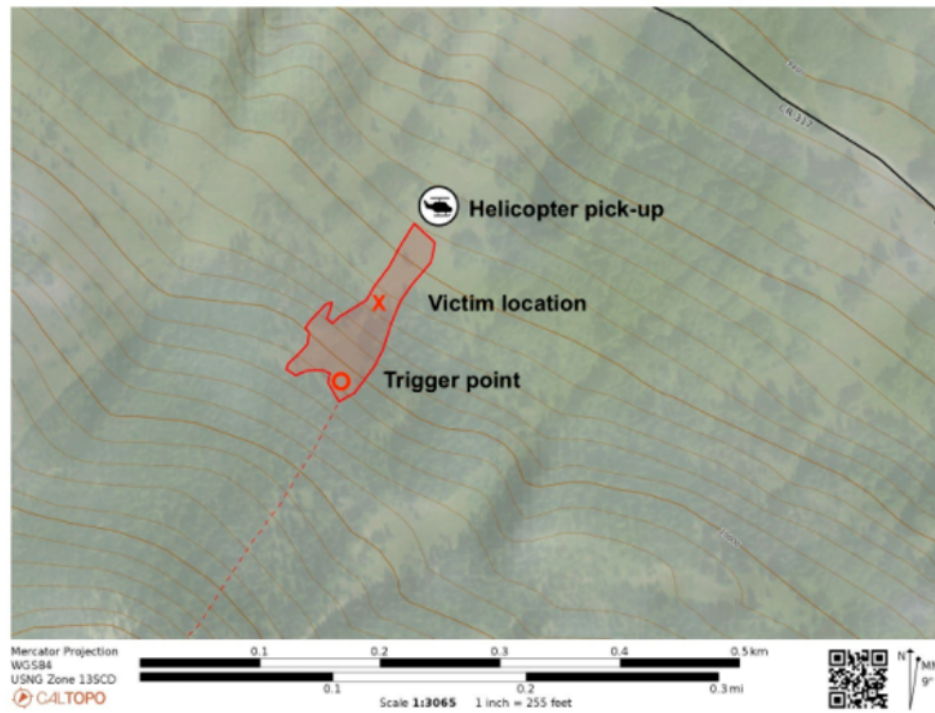


Figure 2: A topographic map showing the approximate extent of the avalanche, Rider 1's entry onto the slope, his location when the avalanche stopped, and the helicopter landing area.

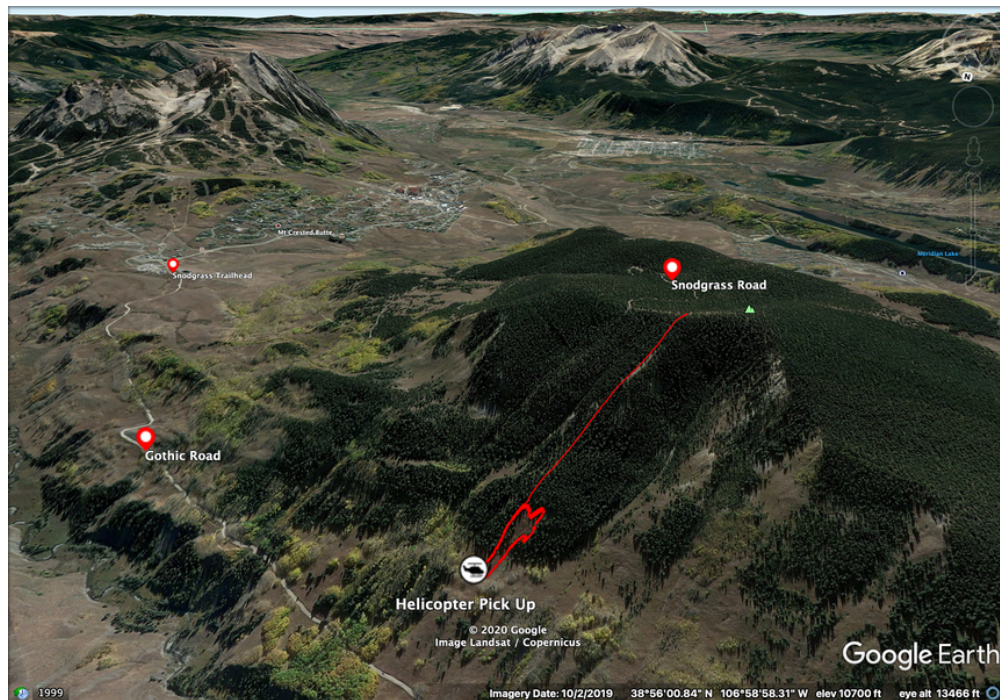


Figure 3: A Google Earth image showing the pair's descent route and the approximate extent of the avalanche.



Figure 4: Looking up at the avalanche during the rescue. The circle marks where Rider 1 triggered the slide and the X marks where he came to rest.



Figure 5: Rescuers preparing to move Rider 1 to the helicopter. Rider 1 hit the tree uphill of the group.



Figure 6: Looking down the avalanche path. Rider 1 triggered the avalanche near the area indicated by the circle. The avalanche carried him down to the location of the X.



Figure 7: Looking across the start zone.



Figure 8: Looking up from the middle of the avalanche into the very steep start zone. The circle marks the approximate location where Rider 1 triggered the slide.



Figure 9: The avalanche pinned Rider 1 into this tree. He was injured but not buried.



Figure 10: Investigators observed a crown profile on December 16. Test results (PST End (12/100)) showed the sensitive nature of this soft slab and weak layer combination.



Figure 11: The weak, faceted snow below the storm snow.

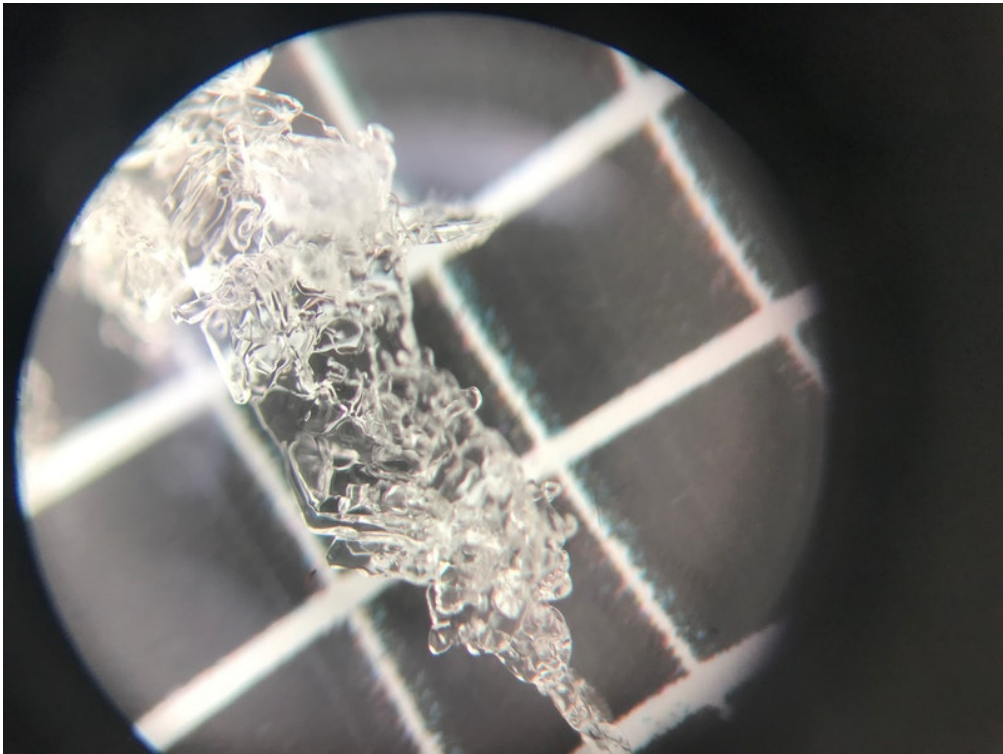


Figure 12: A magnified image of surface hoar buried just below the recent snow, against a 3mm grid.

Snowpits

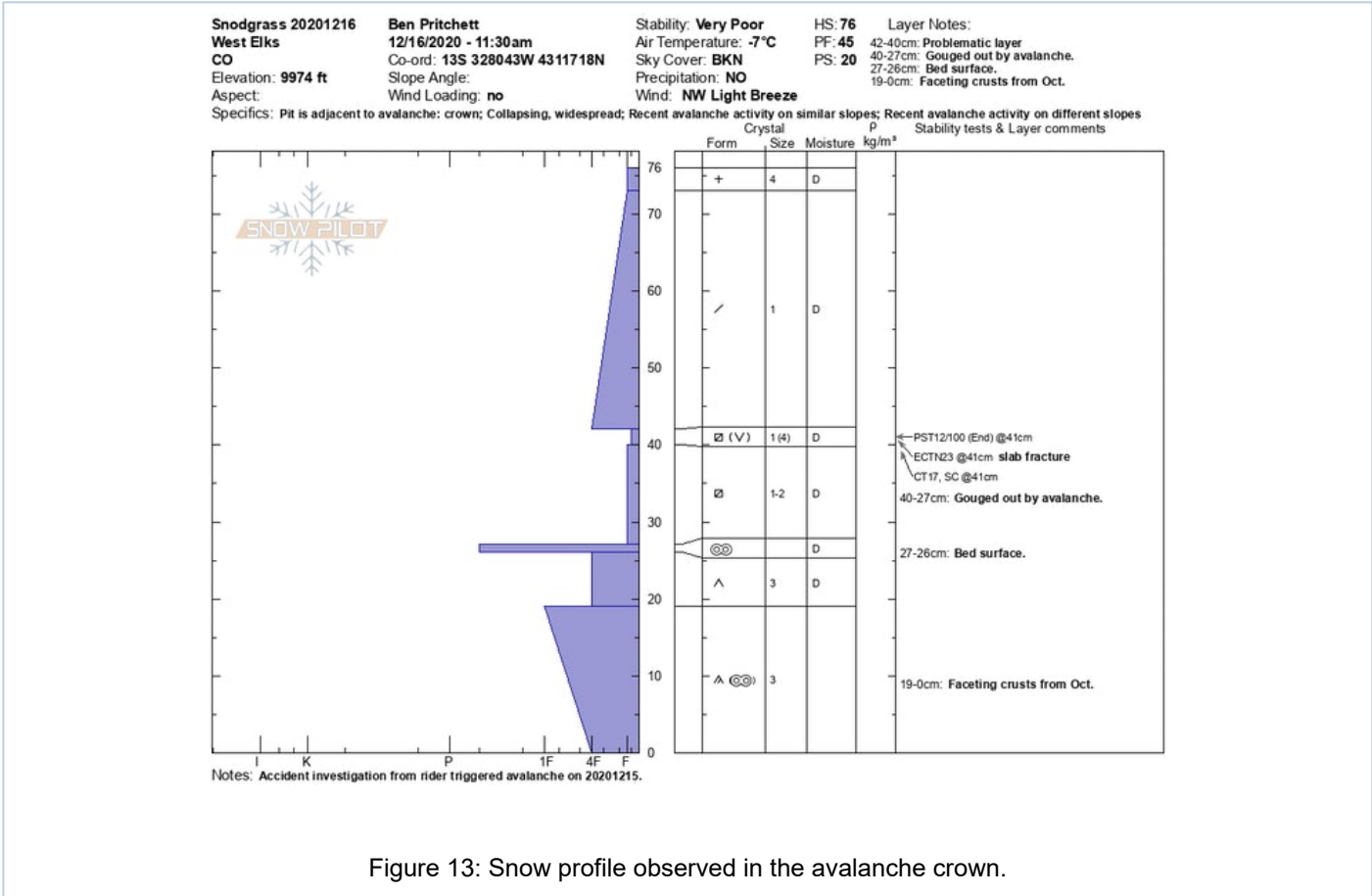


Figure 13: Snow profile observed in the avalanche crown.