

Get Wild: What makes Colorado's snowpack unique?

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Stasia Stockwell
Get Wild



A skier examines the backcountry snowpack in a snow pit.

Stasia Stockwell/Courtesy photo

When it comes to winter, there are a few things synonymous with Colorado: blue skies, light snow and avalanches.

Within our beloved Colorado mountain ranges, an interesting concoction of elevation, temperature, wind and snowfall combine with an abundance of clear, sunny days to form conditions unlike anywhere else in the mountain west. The weather patterns that give us bluebird, Champagne powder days also give us the most avalanche-prone snowpack in the country.

Among the three primary snowpack zones — maritime, intermountain and continental — Colorado falls into the continental zone. We're landlocked on the Continental Divide, far away from any large bodies of water, so our air is bone dry and our precipitation totals are less than those of coastal climates. Our mountains soar to high elevations where the mercury plummets in winter, and overall temperatures fluctuate more dramatically than lower elevation areas.

All these factors make for light and dry snow that's oh-so-fun to ski in, but it's also the reason our snowpack is so touchy.

Snow is like a chameleon. Consistent temperatures and snowfall often help snow crystals morph into little balls — a process snow science professionals call rounding — which make the snowpack cohesive and stable.

Snow scientists and avalanche forecasters have found that the warm, sunny days and cold, clear nights we see so often in Colorado encourage snow to take a different shape. In these conditions, snow crystals grow and form geometric-shaped appendages as they turn into facets. This can occur deep in the snowpack near the ground, or with snow particles on the surface.



Often, when you see sugary snow sparkling on the surface on a cold, clear morning, you're looking at faceted snow crystals. Though beautiful to look at, buried layers of faceted snow are an instigator of avalanches in Colorado. Their angular shape and low water density do not allow them to bond, forming a weak layer in the snowpack.

Once springtime rolls around and our nighttime temperatures in the High Country warm up, the snow crystals transform again, rounding and sticking together to create more stability.

Then, there's another major factor at play in our mountains. Regular Alpine adventurers and skiers at the top of Peak 8 in Breckenridge can tell you one thing for certain: It's windy here. This wind is powerful enough to transport loads of snow from one area to another. This wind-loading that occurs adds another layer to our avalanche-prone snowpack.

Often, we find stiff, thick layers of snow above tree line that avalanche forecasters call wind slab. These wind slabs can break and release from weaker snow layers underneath. If you've seen ski patrollers using explosives to mitigate avalanches on days with no freshly fallen snow, it's likely thanks to the wind.

Our beautiful Colorado weather is like Jekyll and Hyde: It creates tricky avalanche conditions but also allows us to soak up the sun on the high peaks of the Rockies. When we get out to play in the backcountry, we should remember to tread lightly and travel with awareness.

Thankfully, along with our abundance of sunshine, we have a wealth of resources available when it comes to exploring the backcountry in winter. The Colorado Avalanche Information Center offers great information on its forecasting site, and we have a heap of local guiding companies that are happy to teach us more about how to avoid avalanches while still enjoying Colorado's bluebird days and Champagne powder.

Stasia Stockwell.

Jon Stockwell/Courtesy photo

“Get Wild” publishes on Fridays in the Summit Daily News. Stasia Stockwell is a Breckenridge resident and avid backcountry skier, who aims to connect readers from all backgrounds with nature in a meaningful way.

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