Spring Conditions Scenario 1: Cold and Snowy

Weather
While we tend to think of spring weather bringing warmer temperatures, sunny skies, and higher freezing levels it’s not uncommon for intense, winter-like storms to occur. These are often more common early in the season and are often localized but they can dump significant amounts of relatively cool dry snow in the alpine. This snowfall generally transitions to moist or wet snow at lower elevations and rain falls closer to the valley. Just like mid-winter storms, wind speeds can range from calm to extreme.

Snowpack
The warmer the snow, the more cohesive it will likely be, especially when it gets pressed and moved by wind. Just think about how much easier it is to make a snowball when snow is warmer or moister. That’s why significant cornice development can occur in these times. Dense and reactive wind and storm slabs can also be found during and after storms, particularly in upper elevation, lee terrain. The good news is warmer storm/wind slabs are quicker to settle and bond than colder slabs. That said, the presence of melt-freeze crusts (which are common in the spring) can inhibit and slow the bonding process at the old snow/new snow interface. It’s also important to remember that snow that is well-bonded when cool will destabilize quickly when it sees sun for the first time, as is inevitable in the spring, even if it’s a cold and snowy one.

At elevations where precipitation falls as rain, surfaces become moist or wet and lose cohesion. The most rapid change occurs when rain falls on dry snow, which will rapidly become destabilized, often down to the first major crust layer. Saturation of the snowpack can also activate persistent weaknesses such as older crusts, the deeply buried mid-February facet layer, or even basal facets such as the October and November layers from last fall.

Avalanche Activity
Direct action wind slab and storm slab avalanches are the most common avalanches we see with spring snow storms. These avalanches occur within the new snow or at the old snow/new snow interface (often a melt-freeze crust) as the snowpack adjusts to the load of the new accumulations during or just after a storm. Human triggering is still possible in the days after a storm, although much less likely than with a potentially more complex mid-winter upper snowpack. The most intense period of activity is usually associated with warming, either at the tail end of the storm, or just after it, as the sun comes out and rapidly bakes the freshly fallen snow.

Very heavy storm accumulations might directly trigger destructive deep persistent avalanches in isolated terrain but the more likely scenario is that these deep layers are triggered as step-down avalanches from surface avalanches or cornice falls.

At elevations where precipitation falls as rain, pushy loose wet avalanche activity can occur. Wet slab avalanches are also possible in areas where rain has saturated the snowpack and activated persistent weaknesses, or percolated all the way to the ground. Wet activity at low elevations is a classic situation for step-down failures in deeply buried persistent weak layers.
Terrain and Travel Advice

- Be cautious as you transition into wind affected terrain.
- Stay off recently wind loaded slopes until they have had a chance to stabilize.
- Back off steep and aggressive lines and consider sticking to simple terrain at times when cold snow is affected by rain or sees direct solar radiation for the first time.
- Be alert to conditions that change with elevation.
- Give cornices a wide berth when traveling on or below ridge crests.
- Remember that the snowpack will be significantly different at higher elevations than lower down. Different precipitation patterns, different snowpack, and different avalanche problems. You’ll need to adjust your travel and risk management techniques.
- In areas where deep persistent slabs may exist, avoid shallow or variable depth snowpacks and unsupported terrain features.