

SIERRA
AVALANCHE
CENTER[Home](#) > [Avalanche Problems](#)

Avalanche Problems

Each **Avalanche Problem** consists of 4 factors (type, location, likelihood, size). The combination of these factors describes the avalanche hazard.

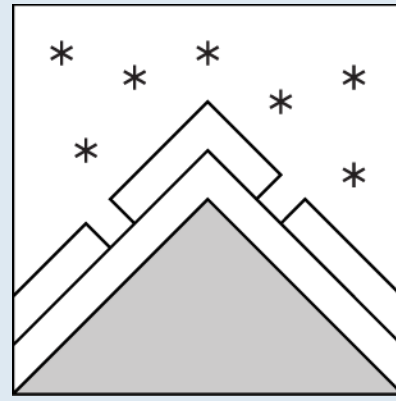
- Avalanche Type (or Character) – One of 9 potential avalanche types
- Location – Where the avalanche is most likely to exist in the terrain, shown with an Aspect/Elevation diagram
- Likelihood – The chance of triggering an avalanche shown on a five-step slider graph going from "Unlikely" to "Possible" to "Likely" to "Very Likely" to "Certain"
- Size – The destructive potential of the expected avalanche shown on a four-step slider graph going from "Small (D1)" to "Large (D2)" to "Very Large (D3)" to "Historic (D4-5)"

To learn more about how Avalanche Problems fit into the avalanche forecast click [here](#).



The Nine Avalanche Problem Types in Most North American Avalanche Forecasts

Storm Slab



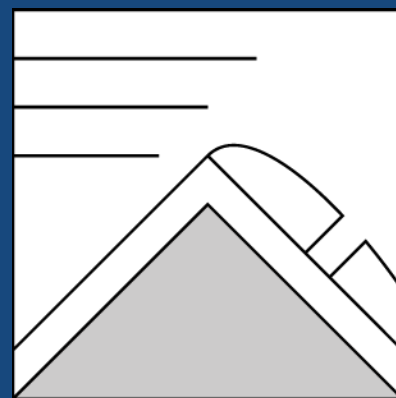
[Storm Slabs](#) involve the release of a cohesive layer (a slab) of new snow that breaks within the storm snow or at the interface between new and old snow. They form during storms.

Depending on the storm characteristics and snowfall amounts, the problem can vary from a thin, relatively harmless soft slab to a much thicker, harder, and more dangerous slab. Storm Slab problems typically last between a few hours and a few days. They are commonly distributed widely across terrain that received similar snowfall amounts. To assess potential size, monitor storm totals, and expect deeper accumulations at higher elevations and in leeward terrain. During a storm, larger, deeper, and sometimes more reactive storm slabs will form where wind-drifted snow piles up on the leeward side of terrain features. Storm slabs in these areas will share characteristics with wind slabs, with the main difference being that these storm slabs formed during a storm with new snow and wind. During these storms, unstable slabs exist across more terrain in wind-affected and sheltered areas. Wind slabs form when the unstable slabs are limited to only wind-loaded areas.

Look for feedback, such as shooting cracks, on small, steep test slopes. Shallow Storm Slabs are most dangerous on larger terrain features or slopes with terrain traps, such as trees, gullies, and cliffs. In some cases, Storm Slabs can be remotely triggered. You can reduce your risk from Storm Slabs by waiting until the storm snow bonds to itself and the old snow surfaces below it before venturing into steep terrain.

Storm slabs that form in wind-loaded areas may transition to Wind Slabs as the storm snow in sheltered areas stabilizes. Similarly, Storm Slabs that form over a persistent weak layer (e.g., surface hoar, depth hoar, or near-surface facets) may also develop into Persistent Slabs if the instabilities last longer, and their behavior becomes more challenging to manage. In some cases, Storm Slabs may be termed Persistent Slabs in the first place.

Wind Slab



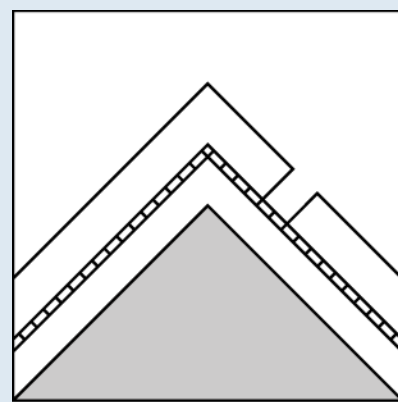
Wind Slabs involve the release of a cohesive layer of snow (a slab) formed by the wind-drifted snow.

They form when wind transports snow from the upwind sides of terrain features and deposits it into thicker drifts on the downwind side. This forms slabs in somewhat predictable and specific locations, such as below the leeward side of ridges or in cross-loaded gullies. Wind Slabs can range from soft to hard, thin to thick, and are often smooth, rounded, and sometimes sound hollow. Blowing snow and cracking or collapsing in drifted snow represent clear warning signs of the problem.

Wind Slabs can be avoided by sticking to sheltered or wind-scoured areas.

Storm slabs that form during storms with wind and snow may form in similar locations as wind slabs, but the storm slabs also form in sheltered areas, making them more widespread during a storm. Wind Slabs that form over a persistent weak layer (e.g. surface hoar, depth hoar, or near-surface facets) may be termed Persistent Slabs or may develop into Persistent Slabs, in which case, their instabilities will last longer.

Persistent Slab

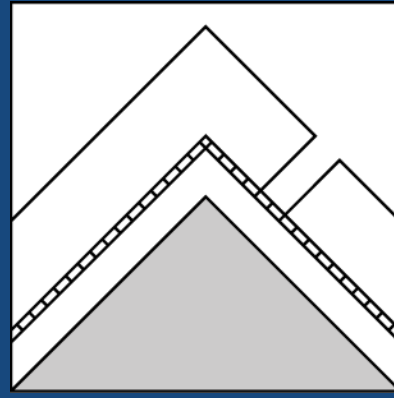


Persistent Slabs involve the release of a cohesive layer of snow (a slab) when the bond to an underlying persistent weak layer breaks.

Persistent weak layers include surface hoar, depth hoar, near-surface facets, and faceted crusts. These layers can vary greatly over short distances and continue to produce avalanches weeks or even months after burial. Persistent Slabs are characterized by difficult to manage and often surprising behavior. They can be triggered long after a storm has passed or release under modest loading events. They may be triggered remotely—from flatter terrain below, above, and to the sides of steep slopes. The slabs often propagate widely and in unpredictable ways. Shooting cracks and collapses are clear warning signs of the problem. However, feedback is often irregular because of spatial differences in weak layer and slab thickness. Thus, tracks on a slope are not an indicator of stability.

Persistent Slabs require a wide margin for error. The most reliable way to manage Persistent Slabs is to make conservative terrain choices. This often means avoiding travel on or below steep terrain where the problem exists, which may be aspect or elevation dependant. Persistent Slabs can develop into a Deep Persistent Slab as additional snow and wind events build a thicker slab.

Deep Persistent Slab

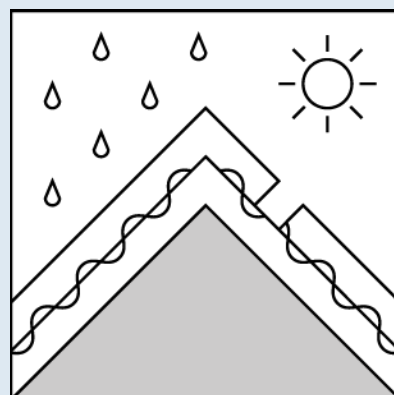


[Deep Persistent Slabs](#) involve the release of a thick cohesive layer of hard snow (a slab), when the bond breaks between the slab and an underlying persistent weak layer, deep in the snowpack or near the ground. They are similar to Persistent Slabs, but deeper and larger.

The most common persistent weak layers involving Deep Persistent Slabs are depth hoar or facets surrounding a deeply buried crust. Deep Persistent Slabs are destructive events that are especially difficult to manage and forecast for. They commonly develop when Persistent Slabs thicken over time and can persist for months. Deep Persistent Slabs are characterized by hard-to-trigger (low likelihood) but deadly (high consequence) events due to the enormous mass of snow involved. They are most commonly triggered from areas where the snowpack is relatively shallow, such as rock outcrops or margins of the slab in wind affected terrain. They typically fail naturally from significant loading events, abrupt weather changes, or cornice falls.

Direct feedback from the problem is rare. Thus, tracks on a slope are not an indicator of stability. Deep Persistent Slabs may be triggered remotely—from flatter terrain below, above, and to the sides of steep slopes – even well down in the avalanche path. Deep Persistent Slabs require a very wide margin for error. Traveling where the snowpack is consistently deep and uniform will help reduce your risk. However, the most reliable way to manage Deep Persistent Slabs is to avoid avalanche terrain where the problem exists, which may be aspect or elevation dependent.

Wet Slab



[Wet Slabs](#) involve the release of a cohesive layer of snow (a slab) caused by meltwater, weakening the bond between the slab and an underlying weak layer.

Wet Slabs often occur during intense or prolonged warming events and/or rain-on-snow events. Wet Slabs are generally more destructive and more difficult to manage than Wet Loose avalanches; they can break widely and without clear warning signs. Because the timing and amount of meltwater draining into buried weak layers vary significantly from slope to slope, there is a high amount of variability and uncertainty in predicting Wet Slabs.

Give yourself a wide safety buffer to handle the uncertainty. If the snowpack has refrozen overnight, you can reduce your risk by traveling early in the day or on colder slopes where surface crusts are strong and supportive to your weight. Otherwise, conservative terrain selection is prudent during significant warm-ups, especially when a poor snow structure or buried persistent weak layer first transitions from dry to very wet. The timing of this transition often varies by aspect or elevation.

Wet Loose

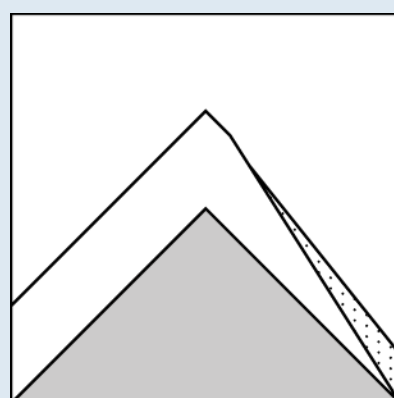


[Wet Loose](#) avalanches involve the release of unconsolidated damp or wet snow.

Wet Loose instabilities develop as sunshine, warming temperatures, and/or rain-on-snow wet and weaken the snow surface, causing it to lose cohesion. They may gouge deeper into a saturated snowpack. Like Dry Loose avalanches, they start at a point and entrain more snow as they fan out and move downhill. However, the Wet Loose avalanches entrain heavier snow that is more difficult to manage or escape from, and in some cases, can entrain enough mass to cause significant damage to trees, cars, and buildings. Wet Loose avalanches can also trigger larger slab avalanches that break into deeper snow layers.

The best way to manage Wet Loose avalanches is to travel when the snow surface is colder and stronger. Time your trips to avoid crossing on or under very steep slopes in the heat of the day. Move to colder, shadier aspects or off of rain-soaked slopes before the snow surface turns slushy. Rollerballs and pinwheels are obvious precursors to Wet Loose avalanches.

Dry Loose

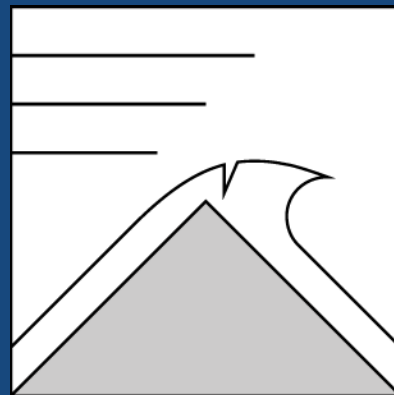


[Dry Loose](#) avalanches involve the release of dry unconsolidated snow.

These avalanches typically occur within layers of soft snow near the surface of the snowpack. Dry Loose avalanches start at a point and entrain more snow as they fan out and move downhill. They vary in size, depending on how much snow is entrained and on the size of the terrain feature where they occur. Dry Loose avalanches can act as a trigger for slab avalanches.

Dry Loose avalanches are the simplest problem to manage because of their predictable behavior and relatively smaller sizes. They are most hazardous if you are caught and carried into a terrain trap such as a gully, cliff, couloir, or thick trees. Management strategies include sluff management and/or choosing less consequential terrain when this problem develops, commonly with new snow or weakening surface snow.

Cornice Fall

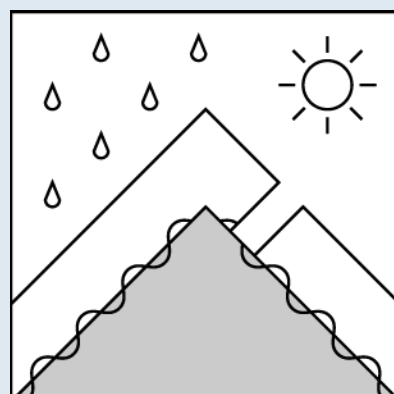


[Cornice Fall](#) involves the release of an overhanging mass of snow formed by wind deposits.

Cornices grow through the winter on the leeward side of wind exposed ridges and summits. Cornices range from small wind lips of soft snow to overhangs of hard snow larger than a school bus. They can break off the terrain suddenly and unexpectedly and can sometimes be triggered from a distance. Overhung cornices can pull back further than expected onto a flat ridge top and catch people by surprise. While large cornices are quite destructive by themselves, even a small cornice can be deadly if it carries you over a cliff or rocky terrain below. The impact from a Cornice Fall can also easily trigger slab avalanches on steep slopes below.

Travel cautiously on corniced ridgelines, giving cornices or unknown edges a wide berth. Limit your exposure to slopes below cornices. Cornice Fall is most likely during periods of significant temperature warm-up or rapid cornice growth due to wind loading.

Glide Avalanche



[Glide Avalanches](#) involve the release of the entire snow cover as a result of gliding over the ground..

Glide Avalanches can be composed of wet, moist, or almost entirely dry snow, and can release under warm regimes and cold regimes. They occur on very specific slopes where the ground surface is relatively smooth, such as slick bedrock or grassy slopes. Glide Avalanches are often preceded by full depth cracks (glide cracks) that are visible across the slope, though the time between the appearance of a crack and an avalanche can vary between seconds and months.

Glide avalanches are unlikely to be triggered by a person, but natural failures are very challenging to predict. Because Glide Avalanches only occur on very specific slopes, safe travel relies on identifying and avoiding those slopes. Open glide cracks are a significant indicator, especially cracks that have opened recently, as are recent Glide Avalanches.

Additional Resources:

[How to Use the Avalanche Forecast](#)

[Danger Scale Tutorial](#)

Newsletter Sign-Up

☒ Also Send me the Daily
Avalanche Forecast



Sierra Avalanche Center

11260 Donner Pass Rd.
Ste. C1 - PMB 401
Truckee, CA 96161

sac@sierraavalanchecenter.org



All Content © 2026 Sierra Avalanche Center