

KMC Mountain School Tech Tips: Evaluating Terrain

In winter, terrain evaluation is (or should be) at the forefront of most of our decisions when traveling in the backcountry. Things like slope aspect, slope shape, elevation (alpine, treeline, below treeline), exposure to overhead hazards (e.g. cornices or large avalanche slopes), or terrain traps (e.g. trees, gullies, abrupt changes in slope angle) all have a bearing on where we choose to skin up and ski down. In summer and spring, we might find ourselves no longer so carefully evaluating terrain with the mistaken idea that winter's hazards are long gone. But, terrain evaluation should figure prominently in all our trips into the mountain environment regardless of season.

Avalanches don't end the day you hang up your skis, and, most snow hikers and climbers are not equipped with the normal avalanche equipment (probe, transceiver, shovel), so when hiking and climbing on snow in spring and summer, think carefully about the likelihood and consequences of an avalanche. Most spring and summer avalanches begin as wet point releases and move comparatively slowly. But don't be fooled, small wet point releases in spring and early summer can quickly entrain large amounts of wet, heavy snow, and even a small amount is enough to knock a hiker off their feet and into or over terrain traps (think trees, cliffs, lakes).

Wet snow avalanches are more likely on solar (west and south) aspects, but when there is no overnight freeze they can occur on any aspect and, even with an overnight freeze, east aspects get the sun early in the day and may destabilize quickly. You can minimize your exposure by planning to be up and down your peak or hike before daytime temperatures warm and by carefully evaluating the terrain you are traveling through. Use caution any time you will be under cornices or large snow slopes or traveling through terrain where the consequences of even a small avalanche are severe - above cliffs, trees, abrupt changes in slope angle, tarns, lakes, creeks, crevasses and other terrain traps. Also, try to choose routes where the entire party will not be stacked up one above the other.

Slips on snow account for a big chunk of all mountain accidents. Of course, the best thing you can do is avoid slipping - get your ice axe out and put your climbing helmet on **before** you commit to crossing **any** snow slope where there is **any** possibility of a slip. Give yourself a solid ice axe belay¹ when moving up, down and across snow slopes and wear a climbing helmet. When hiking and climbing on snow in addition to assessing the terrain with an eye to avalanches, assess the potential consequences of a slip on snow. If the consequences are high, that is, you are traveling above a cliff, trees or boulders, or traveling through trees and boulders do not go unless you are completely confident you will **not** slip (or can self-arrest immediately if you do slip). Consider using a rope to belay sections where the consequences of a slip are high.

Other aspects of terrain you'll want to think about include the potential for rock-fall, either naturally occurring or caused by members of your own party. In general, avoid traveling in loose rock gullies if at all possible and choose instead ridge lines. If you must travel up loose rock gullies use strategies to minimize exposure to rock fall. Either spread your party out across the slope so that no-one is below anyone else, or, if that is not possible, travel closely together so that dislodged rocks don't have the chance to reach warp speed before they impact the next person down. And, of course, wear a helmet.

This is also the season when snow-bridges begin to melt out and crevasses and moats open up. If you are traveling on a snow covered glacier in spring and summer without adequate glacier travel

¹ If you don't know what an ice axe belay is, come out to one the KMC snow workshops and learn this essential skill.

equipment realize that you are playing a high stakes game of Russian Roulette. Although you might consider the risk of a crevasse fall to be minimal, this is the classic low probability high consequence event. Most unroped crevasse falls end with a fatality. At a minimum, take an avalanche probe and investigate snow depth and consistency, **and** be prepared to turn back if the snowpack is shallow or isothermal. Even better, go equipped with standard glacier travel equipment.

Of course, all the usual travel precautions you've been following all winter still apply. Don't linger, have lunch, group up or update your Facebook status under large snow slopes, gullies or cornices. Avoid putting everyone in your group in a hazardous location at one time - save someone for the rescue. Make sure everyone knows and agrees with the plan, and, above all, remember you are a team out there - watch out for each other.



Descending recent avalanche debris in spring