Why Dig a Snowpit?

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Countless individual ice crystals make up a snowpack. From the moment flakes fall from the sky to the spring melt, snow never stops changing. This change is known as snow metamorphism.

When the snowpack lacks a significant temperature gradient (less than 1 degree C per 10 cm of snow depth), individual snow crystals will tend bond to one another making a stronger layer in the snowpack. With a strong temperature gradient (more than 1 degree C per 10 cm of snow depth), individual crystals will become angular or faceted which forms a weak, cohesionless layer. Faceted layers are most often formed on or near the snow surface or near the ground. Once buried, faceted layers can cause problems for weeks even months. Most years, the snowpack is composed of both strong and weak layers.

Snowpack structure can vary greatly from one area to another, even from slope to slope. This phenomenon, known as spatial variability, is not difficult to identify. The snowpack in Cooke City is different than the snowpack around Big Sky. However, recognizing and determining snowpack structure and stability on a slope to slope basis can be more difficult as it is common for one slope to be stable while a neighboring slope is unstable.

Snowmobilers, specifically mountain riders, cover large amounts of terrain during a single ride. The more area a rider covers, the more difficult snowpack assessment is. Sometimes the snowpack provides riders with obvious signs of instability, such as cracking, collapsing or recent avalanche activity. But what if signs of instability are not obvious? What if you know from reading the daily avalanche advisory

that there is a buried surface hoar layer in the area you plan to ride? What if there is little or no evidence as to where this layer can be found?

How to you assess snowpack structure and stability to avoid being caught in an avalanche?

The best choice is to avoid riding in avalanche terrain. Sometimes this is unavoidable, so digging a snowpit is the next best option. Snowpits provide a localized, first-hand look at snowpack structure on a specific slope. By digging a study pit in the snow and assessing the different layers within the snowpack, it is possible to determine the general stability of a slope. Each slope is different and requires its own study pit.

Much can be learned just by looking at the snowpit wall. Often, well developed weak layers present themselves as a discernible line on the smooth face of the snowpit. Sometimes this is all that needs to be observed. A more thorough assessment can be done by stability tests, the most common of which are the compression test (CT) and extended column test (ECT). These quick and easy stability tests help determine if the snowpack on that particular slope is stable or unstable. Taking a basic avalanche education course is the best way to learn how to conduct these tests.

A common misconception is that snowpits and stability tests take a lot of time, but a thorough assessment of structure and stability can be done in less than ten minutes, a small investment of time and energy to ensure rider safety.

Dig snowpits in low angle terrain or on representative slopes. A representative slope is one that has a similar aspect and elevation to the one you plan to ride, but is not avalanche prone. Digging in

avalanche terrain is never a good idea. Once an appropriate snowpit site has been identified, only one rider enters this location as the pit is dug. After conducting a quick stability assessment that indicates the slope is stable, other riders may enter the snowpit.

Next time you're out riding, take the time to put your shovel and head in the snow. It will be informative, fun and might prevent you from triggering an avalanche.