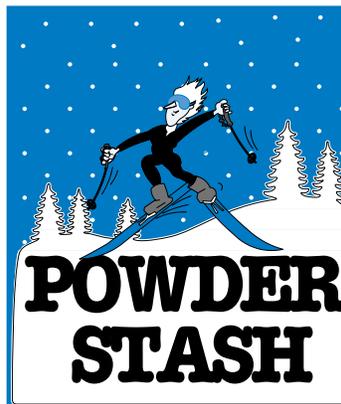




# THE Beacon

Finally, a spring to be proud of! Mother Nature gave us a bountiful late ski season in the spring of 2003, especially around the northern mountains. (The spring ski season in the San Juans was good but short-lived.) I was able to hook-up with the usual cast of characters for our annual July 4th ski. We were one peak southwest of Peak 10 in the Tenmile Range. Peak 10 has a historic reputation for skiing on Independence Day. For years, hardcore spring and summer skiers and riders celebrated our national holiday on what is locally known as the “4th of July Bowl” on Peak 10. This year was no exception as hundreds of die-hards ripped and shredded the fine corn snow.

Now it is time to look ahead to the winter of 2004. So here we are, going into our eighth season of producing *The Beacon* newsletter. In this issue our lead article is by Nick Logan.



by Scott Toepfer

Every season a certain amount of misinformation on avalanches gets regurgitated, either by word of mouth or in print. Nick has come up with “Ten Common Avalanche Myths”—see if any of these sounds familiar.

Early season is also a great time to be thinking about avalanche education. Our education coordinator, Halsted Morris, will tell you what to look for in a good avalanche course. And our third feature article is on Sue Purvis. Sue lives in Crested Butte and has trained an avalanche dog, Tasha. The 108th United States Congress recently recognized Sue for her outstanding work in search and rescue. We are proud to

have her and Tasha both working in Colorado to save lives when they can. And DNR Executive Director Greg Walcher has a special thank you for our donors.

So let's get out there and get those snow gods rockin', because we want to see an epic winter. ❄

## Ten Common Avalanche Myths

by Nick Logan

If you are a winter backcountry traveler and know about avalanches, you probably do a bit of avalanche forecasting for yourself or your group. Let's face it, if you have decided to climb, cross or descend a steep, snow-covered slope, somehow you determined that it probably will not slide. Decisions are based on knowledge and personal experience. If your avalanche-perception is distorted from misinformation, your forecasting (and thus, route-finding) skills suffer. There are many misconceptions about avalanches, so dispel the following 10 myths and make smarter backcountry decisions.

*It's not steep enough to slide.*

Most slab avalanches (about 95 percent) release on slopes between 30 and 45 degrees. However, under certain conditions avalanches can be triggered on slopes shallower than 30 degrees. This could happen in the presence of a very weak snow layer such as surface hoar, or where new snow is struggling to stick to a smooth sun crust. Also, it is not uncommon to trigger an avalanche from nearly flat terrain at the bottom of a steep slope—what we call the compression zone. As CAIC forecaster Dale Atkins says, “It's like pulling

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## Ten Common Avalanche Myths

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the bottom log out of a wood pile.” In the photo below, two snowshoers triggered a small avalanche from 15-degree terrain at the toe of a 35-degree slope. One man died when he was covered by two feet of snow (at the backpack in the lower left of photo). (Photo: Nick Logan ▼)



### *It's got tracks. It must be safe.*

This is a common and dangerous misconception. With tracks already on a slope, you might naturally assume it is safe. But watch out! There are two possible dangers. First, the initial tracks may have begun a failure process that a second descent may complete, allowing the slope to fracture and avalanche. Second, the snowpack often varies considerably in strength from one location to another. If you are looking for fresh snow, you go over to where it is untracked, and thus, untested. In the photo below, judging from the tracks on the left, one would surmise that the slope was safe. One skier found out differently when he was swept down through the rocks while trying to get fresh tracks.

(Photo: Matt Krane ▼)



### *There isn't enough snow to avalanche.*

Avalanches are not uncommon in the Fall before the deeper snows have accumulated. Hunters, climbers and enthusiastic, early-season snow seekers are the likely victims. Snow on a steep hillside does not need to be deep to avalanche, regardless of the time of year. It just needs to be deep enough to form a slab that is not anchored by rocks or vegetation. Also, last winter's snowfields make a very smooth bed surface on which early-season slabs could slide. In the photo to the right, a snowboarder and a skier triggered this one-foot-deep avalanche in November. The new snow did not bond to the smooth, grassy tundra.

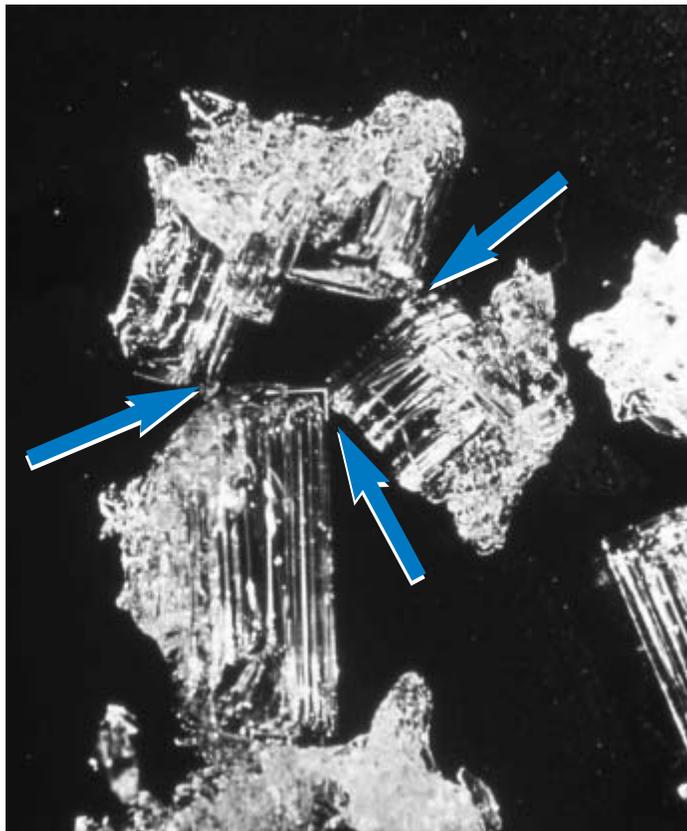
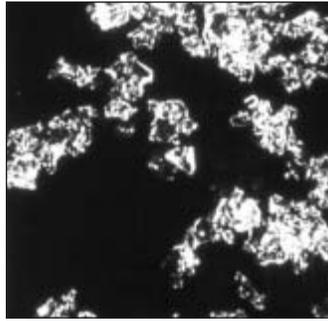
(Photo: Nick Logan ▶)



### *It has been a low-snow year so there's little avalanche danger.*

Actually, just the opposite may be true. When little snow has fallen during the winter, the shallow snowcover becomes very weak as it develops into a faceted snow structure. Facets can easily crumble under the weight of a person or heavy, fresh snow, because the grains have poor bonds with their neighbors. Even when small, faceted grains can be quite fragile.

In these photos at right and below, note the square, faceted shapes and weak attachments to neighboring snow grains. A surface load—more easily applied when the snow is shallow—can easily break the small bonds.



### *The avalanche slid on a layer of ball bearings.*

Some people use this description to describe how an avalanche ran on a buried weak layer. Technically this is not correct because it implies that round snow grains were involved in the snow failure. In reality the weak layer was likely composed of faceted, sharply angled snow (shown above), not round like ball bearings.

### *The slope faces south so it is safe.*

It is true that snow on sunny slopes tends to be more stable due to settlement and bonding. But sunny aspects have their own unique avalanche problems. If it gets too warm, surface melting occurs and any water that runs down into the snowpack destroys the bonds holding the snow together. Upon refreezing, smooth ice crusts form on the surface and new snow has trouble sticking to it. Another

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(Photo: Tim Lane ▲)

## Ten Common Avalanche Myths

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process, radiation recrystallization, can produce a thin layer of faceted snow just below the surface. When buried by more snow, this fragile layer separating the new and old snow can contribute to avalanche formation.

### *It hasn't snowed for a long time. There won't be avalanches today.*

Don't be too sure! Even without a recent snowfall, the wind can cause drifting onto the lee sides of steep ridges and gullies, adding load and stress. Sustained, heavy blowing snow also creates dangerous, unpredictable hard slabs. Even without wind, old snow often becomes weaker with time, as kinetic metamorphism forms faceted snow.

(Photo: Nick Logan ▼)



### *A heavy-snow winter causes more avalanches.*

We certainly saw this happen last spring when some 5 to 7 feet of snow fell along the Front Range. But falling in only four short days, it increased the avalanche danger dramatically. If the same amount of snow were to fall evenly over a few weeks, we would see a strong snowpack. In the latter case a temperature pattern develops in the snowpack that forms rounded, well-bonded snow grains, while also preventing the formation of weak, faceted snow and depth hoar.

### *The last storm was two days ago so the new snow has stabilized by now.*

This is not necessarily true. Temperature effects and loading effects must be considered. If temperatures following the storm remain quite cold (in the teens and below), new snow settles and stabilizes very slowly. It could take many days or even weeks for the new snow to become "stable." Warmer temperatures in the 20's and 30's will speed up the stabilizing process. But also take into account the loading effects of the last storm, which may have put enough additional stress on the old snow that it is now close to its failure point.

Before the storm, it may have taken a large trigger, such as a snowmobile, to collapse a deep weak layer; but now, the weight of one skier or snowboarder might be a big enough trigger.

### *Avalanches don't run in trees.*

Let's qualify this: avalanches do not initiate in thick timber. However, an avalanche can run down through a forest if it starts in a large, open area above the forest. It is not uncommon for avalanches to start in sparsely treed, or gladed forest areas. A skier was killed on the steep, 38-degree treed slope in the right of the photo below. The group avoided the open area on the left due to the high avalanche danger rating posted at the time, but the danger was just as high in the trees. (Photo: Nick Logan ▼)



I want to add one more common misconception to this list. Though not directly snow related, it is more than appropriate to include here. And that is: "We'll be fine. We're carrying beacons, probes and shovels." It is easier to avoid an avalanche accident than it is to affect a live rescue in the event of one. This equipment will not keep you out of an avalanche. Good route-finding will. And while rescue gear helps you find the victim faster, that does not mean they will be found alive. About 25 percent of avalanche fatalities occur from trauma. About 65 percent of the victims suffocate because they are not found fast enough or they are buried too deep.

Do not let these tools lead you into a false sense of security so that you take unnecessary risks. All that is needed for an avalanche is a steep slope, a slab (hard or soft snow), a sliding layer, and a trigger. The avalanche does not care if you are an "expert," or what month it is, or how old or what sex you are, or that you just took an avalanche class, or if you are on snowshoes or a snowmobile. The avalanche frankly could care less. It requires only that the four ingredients come together. So, dispel the myths. Try to outsmart the avalanche by having the right information in your quiver of snow-knowledge and travel accordingly through the backcountry. ❄️

# What Makes A Good Avalanche Course?

by Halsted Morris, Education Coordinator

As an avalanche instructor for the CAIC, I am often asked what further avalanche courses people should take. It is great when folks come up after a program and ask this. Part of my job is to get people interested in learning more about avalanches.

At the CAIC we believe that avalanche education is critically important to being "safe" in the backcountry. As much as the CAIC forecasters may talk about carrying the proper avalanche rescue equipment (avalanche transceiver, shovel, slope meter and probe pole), the knowledge that keeps you from getting caught is more important. The best piece of equipment you have in the backcountry is your avalanche-educated brain.

The ideal avalanche education would be for students first to attend a two-hour avalanche awareness presentation. Actually, this is not a bad idea for even experienced backcountry travelers; a yearly "refresher" is good for everyone. Once you have attended an awareness talk, then I would recommend a three-day Level 1 course. After taking the Level 1 course, it is good to get in a season or so of field experience before taking a Level 2 course.

Refresher courses or the five-day National Avalanche School are also recommended. There is always something new happening in the avalanche field, and this is a good way to keep up to date.

I recommend that you check out the American Avalanche Association's (AAA) Web site at [www.americanavalancheassociation.org](http://www.americanavalancheassociation.org). On the education page, there is a description of what the AAA recommends as curriculum guidelines, course objectives and course prerequisites, for Level 1 and Level 2 courses. The CAIC follows the AAA curriculum in all its Level 1 and 2 courses.

There are a number of good avalanche schools available in Colorado. The CAIC Web site lists schools at which the CAIC staff teaches, and those that have good long-term track records. When you are shopping for an avalanche school, there are a couple of important things to keep in mind.

The first consideration is the level of training and experience of the instructors. Do not be afraid to ask schools about their instructor's backgrounds, training and certifications. All CAIC staff members who teach courses are professional members of the AAA and have extensive field experience. The AAA certified instructor program started last year and is becoming an industry standard.

There is also a very good program run by the American Institute for Avalanche Research and Education (AIARE) that trains avalanche safety instructors. AIARE instructors conduct a number of courses around Colorado and provide excellent instructor training.

In selecting a school, ask if it follows the AAA curriculum guidelines. If it does not, the school should be willing to tell you why. If you have reviewed the AAA curriculum guidelines, you will be able to judge if their reasons are valid. In general, if it does not follow or exceed the AAA curriculum guidelines, the instruction will not be complete.

The student-to-instructor ratio is also important. Ideally, the student-to-instructor ratio should not exceed 6-to-1. Once the ratio gets beyond 8-to-1, a single instructor will have trouble managing the class. A small student-to-instructor ratio will help you gain the best education possible, and it also helps insure a safely run class.

Avalanche education is really a "hands-on" affair. When checking out a potential school, ask how much time is spent in the field, compared to the classroom. At the CAIC we feel that at least 50 percent of course time should be spent on snow, in the field. It is also worthwhile to ask how the classroom portion of the course will be handled. Will it be a lecture-based program with or without audio-visual aids, or a preprogrammed presentation?

Also ask what equipment and travel skills are required. The school should provide an equipment list for the field (e.g., skis, ski skins, snowshoes, shovel, probe pole, snowpit kit, beacon, food, water, and warm clothing) and tell you how strenuous and what type terrain will be traveled. The last thing a student wants to find out is that the school is not providing avalanche transceivers, just as you are about to go into the field.

Finally, it will certainly help if you can catch up on a little outside avalanche reading. There are a number of good avalanche books on the market today. Here are a few I recommend:

- *Staying Alive In Avalanche Terrain*, by Bruce Tremper.
- *Snow Sense: a Guide to Evaluating Snow Avalanche Hazard*, by Jill Fredston and Doug Fesler.
- *Backcountry Avalanche Awareness*, by Bruce Jamieson.
- *Secrets Of The Snow: Visual Clues to Avalanche and Ski Conditions*, by Edward LaChapelle.

Your avalanche education will be a life-long involvement. A Canadian heliski guide friend with 30+ years of avalanche experience once told me, "If you think you know it all, you're dead." I think that statement about sums it best. Everyone should attend an avalanche school, and always remain humble in the mountains. They do not often forgive our mistakes. ❄️

# Commendation For Sue Purvis

by Scott Toepfer

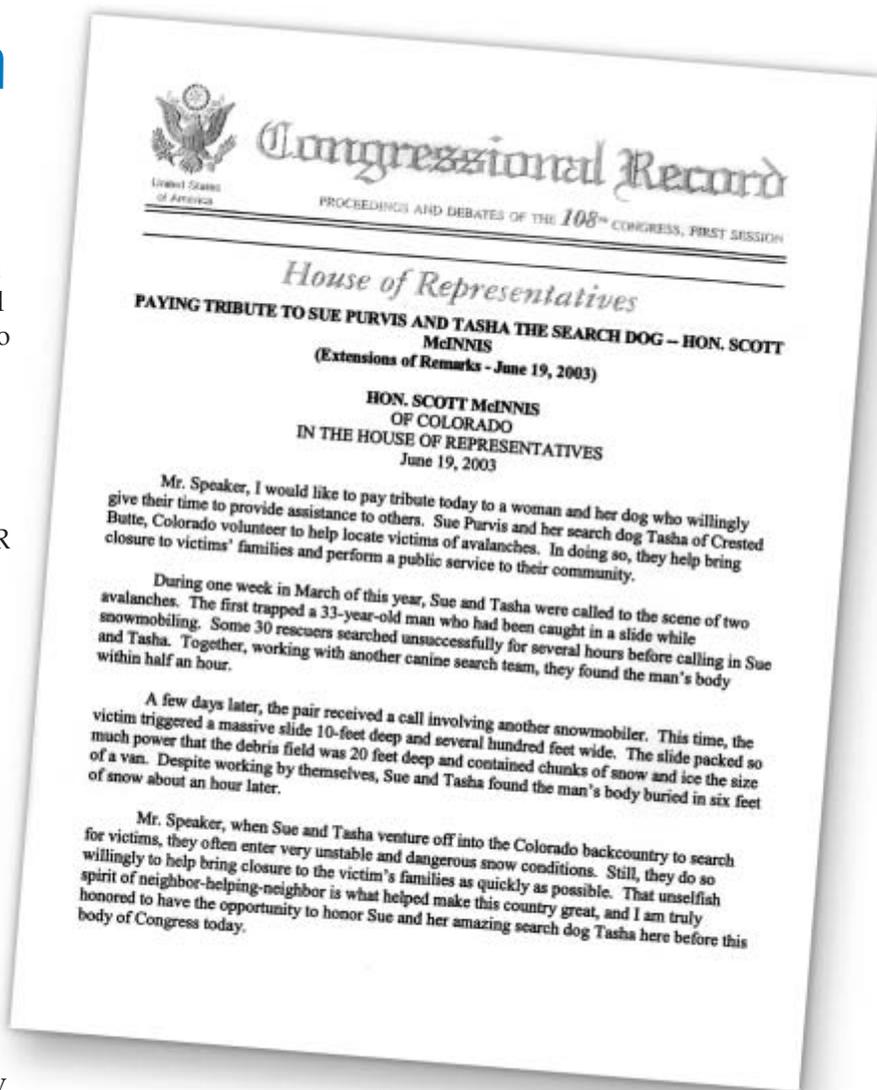
Sue Purvis has lived and worked around Crested Butte for the last ten years. She and her husband Dave Rowe, both geologists, moved to the Colorado Mountains because they needed a life change from the hot Caribbean. One of the first things Sue did was to adopt a five and a half week old black lab. They named her Tasha. When Tasha was eight weeks old Sue began to train her for search and rescue (SAR) work. Not knowing a thing about SAR training then, Sue had her work cut out. A number of people around the State trained SAR dogs, so Sue hopped in her truck, traveled around the State, and learned what she needed. Sue and Tasha quickly joined Search and Rescue Dogs of Colorado (SARDOC) and began the rigorous training and certification process for wilderness and avalanche search work. Carla Wheeler from Aspen was one of her best sources of information and help. Carla volunteers for Aspen Mountain Rescue and has trained her own dog, a white standard poodle named Cassidy.

Crested Butte and Gunnison County did not have a certified rescue dog before Sue and Dave moved there. Tasha and Sue were the first certified team in wilderness and avalanche work. They are both active members in SAR around Crested Butte and Gunnison County. Each year they help train members of the local search and rescue teams and other law enforcement agencies in the how's and why's of search dogs.

Since moving to Crested Butte Sue has worked as a ski



Sue and Tasha at work.



patroller for two seasons

and as a guide at Irwin Lodge. She and Tasha have also worked at the Elk Mountain Grand Traverse Race from Crested Butte to Aspen for the first four years it was run, mostly at Star Pass—a great place to see the sunrise.

Sue and her husband cannot think of a better place to live, so Crested Butte looks to remain home for awhile. She can see some 60 avalanche paths out her front window—country that puts demands on rescuers. Whenever the call for help comes in, Sue and Tasha will likely respond.

The last time I ran into Sue, she was out for a Nordic ski up Washington Gulch just outside Crested Butte. Since then, Scott McInnis, a Colorado Representative in the U.S. House of Representatives, honored Sue with a tribute entered into the proceedings and debates of the 108th Congress. That tribute is shown above. Our congratulations go out to both Sue and Tasha for this wonderful recognition. Keep up the good work.

For more information about avalanche rescue dogs and how they are trained, try her Web site: [http://www.cboutdoors.com/Dog\\_Team/Dog\\_Team.htm](http://www.cboutdoors.com/Dog_Team/Dog_Team.htm). ❄️

# A Special Thank You To Our Major Contributors

from Greg Walcher, Executive Director, Colorado Department of Natural Resources



The Friends of the CAIC, beginning its eighth season, has been an enormous help in keeping backcountry avalanche forecasting alive. More than 700 of you supported the Center at the \$30 and \$45 levels, and another

46 donated more last year. The Center Staff joins me in thanking each of you for underwriting a successful 2002–03 season. Your generosity is greatly appreciated.

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