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## Avalanche Survival: Know Your Snow

By MICHAEL KODAS

It was a skier's fantasy: four feet of powdery, fresh snow draped across the backcountry of Red Mountain Pass in Colorado. But the dream quickly turned nightmarish when, just a few feet from my skis, the slope tore open and a gash ripped across the mountain like a zipper. I fell into a shallow crevice and watched as a slab of snow broke into chunks that tumbled down like giant cinderblocks.

I was lucky that March day, but in the world of backcountry snow sports, where there is no [ski](#) patrol or [avalanche](#) control, luck can quickly run out.

Hence my decision to enroll in a three-day avalanche safety course.

Interest in avalanche training has intensified recently as backcountry sports have surged in popularity. Fat skis, high-tech bindings and a lust for deep powder fueled by "ski porn" — movies and magazines that show extreme athletes on remote snow-choked peaks — have spurred what Doug Abromeit, director of the [United States Forest Service National Avalanche Center](#) in Idaho, calls "a quantum leap in the number of backcountry skiers."

Jim Collinson, an assistant director of the Snow Safety department at Snowbird ski resort in Utah, has noticed it, too. "Thirty years ago people didn't ski the backcountry because the gear wasn't any good for it," he said. "Now the gear's so good, there's an explosion of 'experts' in the backcountry."

Not surprisingly, fatalities have also increased. According to the Colorado Avalanche Information Center, the number of people killed in slides in the United States has climbed steadily over the last 50 years — from one death in 1960 to 30 or more in 5 of the last 10 years. (One of the most recent fatalities was Scott Kay, director of the ski patrol at Wolf Creek Ski Area, who was killed doing avalanche control inside the ski area boundaries on Nov. 22.)

Despite the dangers, the backcountry continues to draw athletes who want to "earn their turns" on ungroomed slopes. Like me, many of them seek safety training. The number of people taking such classes in the United States has risen from 2,000 to nearly 3,000 annually over the last three years, said Brian Lazar, director of the [American Institute for Avalanche Research and Education](#), based in Gunnison, Colo. The classes, which cost \$150 to \$500, focus on how to avoid and survive a slide, and how to rescue someone when disaster strikes. I took a three-day Level 1 course, offered by Crested Butte Mountain Guides, which costs \$450 and includes two nights' lodging in a mountain hut in the Colorado backcountry. The six students in my class began by practicing rescues using transceivers, or beacons — crucial safety tools, which, along with collapsible probes and shovels, are indispensable for backcountry skiers.

Transceivers send and receive radio signals, allowing rescuers to search for someone buried in the snow. The victim's location is then pinpointed with the probe.

Then the digging begins. Surviving an avalanche burial is a race against the clock. Most victims who survive the initial impact of an avalanche have 15 minutes before the warmth of their breath melts the snow around their face, which will refreeze into a casing of ice that can suffocate them. Victims can increase their survival chances by remembering that avalanches are made up of water. Like a swimmer trying to avoid drowning, the key is to stay on top of the snow.

"Fight, fight, fight," said Jayson Simons-Jones, our instructor and owner of Crested Butte Mountain Guides. "I don't care if you do the breaststroke, butterfly, crawl or dog paddle. Swim!"

Later we studied topographic maps, weather and avalanche reports, and diagrams depicting cross-sections of snow slopes to learn how terrain, weather and snowpack make a slope safe or deadly. A key activity was digging a square-walled pit so that we could see exactly how the snow looked in cross-section. We poked and prodded the snowpack, checking for weak layers, and examined the crystals for shapes that looked prone to sliding.

Mr. Simons-Jones, a former ski patrol member, said he became obsessed with avalanche safety after being caught in a slide himself. He has taught avalanche skills for 10 years, and says he has seen a threefold increase in backcountry traffic in Crested Butte, in the heart of the Colorado Rockies, one of the riskiest places in the United States when it comes to avalanches.

"Twenty years ago there would be one or two tracks in Red Lady Bowl every few weeks," said Mr. Simon-Jones, referring to the area's signature backcountry run. "Today it's wall-to-wall tracks."

"It's not hard to get into avalanche terrain in Colorado," said Mr. Lazar, of the avalanche research institute. Without even realizing it, "you can walk into it," he said.

The institute is responsible for developing the avalanche safety curriculum for Crested Butte Mountain Guides and more than 60 other providers of avalanche training around the country. Besides learning how to find and dig out avalanche victims, students are taught to recognize and travel safely through risky terrain and to analyze weather and snowpack to avoid slides. More recently, the institute has developed a one-day introductory course, and is working on a curriculum dedicated to snowmobilers.

Other efforts include those in Utah, where educators provide training for middle- and high-school students. “We’ve educated more than 100,000 school kids in the past five years,” said Mr. Collinson of Snowbird.

The Colorado Avalanche Information Center now delivers its avalanche forecasts with [Twitter](#) feeds and e-mail alerts; in the Tetons, Web sites, blogs, e-mails and radio reports increase avalanche awareness. “The avalanche refresher courses given to the community are often standing-room-only,” said Jackie Skaggs, a spokeswoman for Grand Teton National Park.

Many experts worry that there is one group they are not reaching: skiers and snowboarders staying at resorts who don’t realize the risks when they head into the ungroomed countryside surrounding resort property. Inside the resort itself, ski patrols all but eliminate the avalanche hazard by compacting the snow or using explosives.

“People there are really ignorant of the hazard that lies just outside the boundary,” Mr. Collinson said.

Ms. Skaggs said she had noticed the same lack of awareness. “People were used to the avalanche control in the resort and were expecting that in the backcountry,” she said, referring to the Jackson Hole resort. Billy Mattison, of the Vail ski patrol, said an increasing number of the people using backcountry gates at Colorado resorts are carrying essential safety items, but he worries that “people aren’t familiar with the gear.” The resort put in a “beacon basin” where people could practice locating buried transceivers, but Mr. Mattison said few guests use it.

Only a quarter of the victims buried in avalanches survive longer than 35 minutes, according to the American Avalanche Association, and Mr. Mattison and other experts want backcountry skiers to know that efficient searching and shoveling are crucial skills.

“If you’re buried, your only hope is your partner,” Mr. Mattison said.

#### **WEIGH THE RISKS**

According to the American Institute for Avalanche Research and Education, the reason most people are caught in [avalanches](#) is simple: they do not appreciate the risk. So factors that either increase a person’s tolerance of risk or dull the perception of risk become dangerous. This means — perhaps counterintuitively — that among skiers and snowboarders, young, fit and experienced athletes suffer the greatest number of fatalities in avalanches. When [skiing](#) backcountry, you may be more likely to put yourself in danger if you are in any of these categories:

**A YOUNG MAN** Men from 17 to 27 years old (especially when childless) tend to be more willing to take risks than women and older people.

**SKIING ON A SUNNY DAY** Risks tend to be ignored when the weather is good.

**SKIING FAMILIAR TERRITORY** If people have been exposed to risk in a familiar place and nothing happened, they become hardened to that risk.

**SKIING IN A LARGE GROUP** People find security in numbers and tend to accept risks that the individual members would not accept alone or in smaller groups.

**SUBMITTING TO PEER PRESSURE** People can push friends and acquaintances to accept risks.

**FOLLOWING OTHER SKIERS** If others are seen safely traveling dangerous terrain, many people will assume the area is safe. It might not be.

**TOO INTENT ON A GOAL** The more important an objective is, the more a person will ignore risks to achieve it.

**SKIING LATE IN THE DAY** The urge to “get it over with” and return to safety, food and shelter can overwhelm judgments of risk. Poor decisions are often made late in the day and close to home.