

NATIONAL
SKI AREAS
ASSOCIATION



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NSAA Avalanche Safety Fact Sheet

LAKEWOOD, Colo., Sept. 15, 2016—While the overwhelming majority of avalanche incidents occur in the backcountry, avalanches can occur within the boundaries of ski areas, despite the best efforts of highly trained ski area professionals. As always, safety remains the top priority within the ski industry, and ski areas focus on in-bounds avalanche mitigation, safety, and public education measures to reduce the risk of avalanches and snow slides. As a result of these efforts, the 2015-16 season was the third straight season where there were zero in-bounds avalanche fatalities at U.S. ski areas.

“By the very nature and location of skiing, avalanches remain an inherent and recurrent risk within the sport,” stressed Michael Berry, president of the National Ski Areas Association (NSAA). “Skiers and snowboarders need to take precautions and educate themselves about the risks involved whenever they’re in avalanche-prone areas.”

While there were no fatalities resulting from in-bounds avalanches during the 2015-16 ski season, there were 27 fatalities from avalanches in the United States—all of them occurring in the backcountry, outside of ski area boundaries, according to statistics compiled by NSAA and the Colorado Avalanche Information Center (CAIC). There were 11 avalanche fatalities in the United States during the 2014-15 season—again, all of them occurring in the backcountry, outside of ski area boundaries. There has not been an in-bounds avalanche fatality at a U.S. ski area since the 2012-13 ski season (however, one ski patroller died in an avalanche-related incident far beyond the ski area’s boundary during the 2013-14 season, and two patrollers died in avalanches during the 2012-13 ski season).

Since 2000, there have been 449 avalanche fatalities in the U.S.—the overwhelming number occurring in the backcountry—with an average of 28 avalanche fatalities per season (see chart). To view CAIC’s fatality statistics by year and location, visit <http://avalanche.state.co.us/accidents/us/>.

Despite the risks associated with avalanches, fatalities resulting from avalanches at ski areas in the U.S. are extremely rare. Since 2000, of the 449 total avalanche-related fatalities, 11 have involved guests skiing or snowboarding within ski area boundaries. In short, 2 percent of all U.S. avalanche fatalities since 2000 have involved guests skiing or snowboarding in-bounds at U.S. ski areas. Notably, statistics show that there is less than one fatality from in-bounds avalanches at ski areas per one hundred million skier visits (see chart below).

Avalanche fatalities that occur *within* the boundary of a ski area are extraordinarily unusual compared to avalanche fatalities occurring in the backcountry—indeed, 98 percent of all avalanche fatalities occur in the backcountry. In the last six ski seasons, three guests have died in avalanches occurring within the ski areas boundaries in the United States. Going back to 1980, there have been 16 guest fatalities resulting from in-bounds avalanches at U.S. ski areas, which averages to well below one avalanche fatality per every *two* ski seasons. It should be noted that of these 16 guest fatalities occurring at U.S. ski areas since 1980, one-third of these avalanches were caused by naturally occurring avalanches or by unrelated skiers.

Moreover, according to CAIC’s avalanche fatality data, far more deaths occur to individuals who are snowmobiling, climbing, hiking, or showshoeing than to those who are skiing or snowboarding. In the last 10 seasons (since 2006-07), there have been 155 avalanche-related fatalities involving snowmobilers, hikers, climbers, snowshoers, and other non-skiers. For skiers and snowboarders, there have been 120 fatalities. Indeed, of the 275 avalanche fatalities since the 2006-07 season (including those of unknown origin), 56 percent of all avalanche fatalities involved snowmobilers, hikers, climbers, snowshoers, and other non-skiers. Only 44 percent of avalanche fatalities in the U.S. have involved skiers or snowboarders during the last 10 ski seasons.

NSAA collects data on avalanches to provide the public with information on the true risk of avalanches occurring within bounds at U.S. ski areas. Without a doubt, industry avalanche experts uniformly agree that avalanches—whether in-bounds at a ski area or in the backcountry—are truly an inherent risk in the sport, and that while the risk of avalanches can be minimized, it can never be fully eliminated. In fact, on May 31, 2016, the Colorado Supreme Court became the first state supreme court to rule in *Fleury v. IntraWest* that avalanches which occur within the boundaries of a ski area are an inherent risk of the sport (under the Colorado Ski Safety statute), and that skiers and snowboarders assume these risks and injuries by participating in the sport.

In calculating fatalities at U.S. ski areas, NSAA includes fatalities that occur to guests skiing or snowboarding in-bounds. To be clear, if a guest skis out of bounds into the backcountry—even if the backcountry was accessed from the ski area—NSAA does not include that as a fatality occurring

within a ski area’s boundaries, because this does not reflect the true risk to those skiing or snowboarding in-bounds at a ski area. Furthermore, NSAA does not include deaths of patrollers or other employees at ski areas in our fatality rate calculation; this also does not reflect the true risk to the skiing public (patrollers conducting avalanche mitigation work or working with explosives have an overall higher risk than the skiing public¹). As noted previously, of the three in-bounds fatalities during the 2012-13 season, two were ski patrollers killed in avalanches while on the job, and both were in areas closed to the public (in the 2013-14 season, one ski patroller died in an avalanche while working in the backcountry several miles beyond the ski area’s boundary). Again, during the 2015-16 ski season, there were zero avalanche fatalities of guests at U.S. ski areas, and zero avalanche fatalities for ski area employees.

“Resorts do a phenomenal job with avalanche mitigation given how few fatalities there have been,” noted Dale Atkins, an avalanche specialist in Avon, Colo., and vice president of the Avalanche Rescue Commission for the International Commission on Alpine Rescue.

“The ability to manage Mother Nature is limited, particularly in alpine environments where local weather conditions can change dramatically in minutes,” emphasized NSAA’s Michael Berry.

Ski areas have utilized aggressive training and education efforts to help minimize the number of in-bounds avalanche fatalities, including frequent use of explosives to intentionally release unstable snow. (Since the late 1950s there have been far more than 3 million detonations of hand charges to mitigate avalanches in the U.S., according to the American Avalanche Association.) Despite the industry’s solid track record, however, avalanche mitigation is an imperfect science. As Ethan Greene, PhD., the director of the Colorado Avalanche Information Center and a former ski patroller, emphasizes, avalanche fatalities do occur at ski areas despite the fact that areas have impressive safety records spanning several decades.

“Ski patrols can minimize the danger to an extremely low level but they can’t completely eliminate it,” noted Karl Birkeland, PhD., the director of the United States Forest Service Avalanche Center, which monitors avalanche activity in national forests.

Each ski season, ski areas pursue snow safety with vigor, taking proactive steps to provide avalanche safety education to guests and employees, including mountain signage and closures, informational videos, and hands-on training in the use of avalanche transceivers. Individual, personal responsibility remains a hallmark of avalanche precaution and preparedness. NSAA emphasizes that

¹ The data collected by CAIC does *not* distinguish between guests and employees (such as ski patrollers) in terms of how CAIC tabulates in-bounds fatalities at U.S. ski areas. As a result, data on CAIC’s website includes some ski patrol fatalities at U.S. ski areas as in-bounds avalanche fatalities in its total fatality numbers. Again, NSAA only includes fatalities to the skiing public (i.e., guests) at U.S. ski areas, and does not include ski patrol fatalities.

skiers and snowboarders should *always* ski with at least one partner, and keep those partners within sight. Strict adherence to trail and terrain closures can also reduce the risk of avalanches. Those who ski extreme terrain should carry avalanche equipment, including transceivers, reflectors, airbags, probes and shovels, and cell phones. Skiers and snowboarders accessing extreme terrain should ski the slope one at a time, rather than in a group—especially when the terrain is first opened for the season or after a large storm, when many avalanches occur. Also, when headed to avalanche-prone terrain or into the backcountry, skiers and boarders should always let their friends and family know where and when they are going. And it is always essential to check *first* with a ski area’s ski patrol about open and closed terrain, and current avalanche and snow slide conditions.

Furthermore, ski helmets are effective at limiting injuries. According to medical research, although 75 percent of avalanche deaths are due to asphyxiation or suffocation, 25 percent of avalanche deaths are due to trauma. See *Wilderness Medicine*, page 56, Dr. Colin Grissom, Dr. Martin Radwin, Dale Atkins, and Dr. Scott McIntosh, 2012.

While there has been a slight increase in avalanche fatalities at ski areas over the past two decades, most avalanche and industry experts attribute the increase to a combination of unusual weather conditions and recent technological advancements in ski equipment. Wider skis and all-mountain skis allow easier access to more extreme and steeper terrain on the mountain, increasing the odds of triggering—or becoming engulfed in—an avalanche, snow slide, or slough. Simply put, skiing and snowboarding, as with any high-risk activity or sport, requires education, awareness, the right equipment, and good judgment to make the sport as safe as possible, and this is especially true given the vagaries of avalanches, slides, and sloughs.

THE NATIONAL SKI AREAS ASSOCIATION, LOCATED IN LAKEWOOD, COLO., IS A TRADE ASSOCIATION FORMED IN 1962 FOR SKI AREA OWNERS AND OPERATORS NATIONWIDE.

Avalanche Fatalities in the United States, by Decade

| SEASON | Total U.S. Avalanche Fatalities* | Total In-Bound Ski Area Guest Fatalities* | Skier Days** (in millions) | Fatality Rate (per million) <i>In-bounds Only</i> |
|-----------|----------------------------------|---|-------------------------------|---|
| 1980-1990 | 143 | 4 | 502.2 (1980/81 – 1989/90) | 0.008 |
| 1990-2000 | 234 | 1 | 523.8 (1990/91 – 1999/00) | 0.002 |
| 2000-2010 | 293 | 8 | 574.9 (2000/01 – 2009/10) | 0.014 |
| 2010-2016 | 156 | 3 | 331.3 (2010/11 – 2015/16) | 0.009 |

* Statistics compiled from the Colorado Avalanche Information Center data

** Data according to the 2015/16 NSAA Kottke End of Season Survey

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