Snow and Avalanches

Annual Report 2004-05

Forest Service Utah Avalanche Center

In partnership with:

Utah State Parks and Recreation
Friends of the Utah Avalanche Center
National Weather Service
Utah Division of Comprehensive Emergency Management
Salt Lake County
Utah State University

Bruce Tremper cautiously approaches a large and dangerous cornice in the Logan area mountains

Cover photo:
Forest Service Utah Avalanche Center Director, Bruce Tremper, captures an amazing natural avalanche near Aspen Grove, Utah.

All photos in this report are taken by the staff of the Forest Service Utah Avalanche Center unless otherwise noted.

Copies of this report can be obtained by writing, calling or e-mailing:

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801-524-6301 fax
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The Forest Service Utah Avalanche Center—An Overview

Our goal:

Help keep people on top of the Greatest Snow on Earth instead of buried beneath it.

Where do avalanche accidents occur?

Ninety nine percent of all avalanche fatalities occur in the backcountry—areas outside of ski area boundaries where no avalanche control is done. Ski areas and highway avalanche control crews routinely knock down avalanches with explosives before the public arrives each morning. They have done their jobs so well that since 1980, less than one percent of avalanche fatalities have involved general public on open runs at ski areas or on open highways.

What kind of people get caught in avalanches?

Ninety two percent of people killed in avalanches since 1985 have been recreationists, and they are almost always very skilled in their sport. In almost all cases their skill in their sport significantly outpaces their avalanche skills. Looking at the most recent 5 years of national data, nearly twice as many snowmobilers have been killed as any other user group, followed by climbers, backcountry skiers, snowboarders and miscellaneous recreationists such as hikers and snowshoers.

How do people get caught?

In over 90 percent of avalanche fatalities, the avalanche was triggered by the victim or someone in the victim's party. Which is actually good, because it means that, 90 percent of the time, we can avoid avalanche accidents through our route finding and snow stability decisions.

In summary, avalanche fatalities occur almost exclusively in the backcountry, almost always involve recreationists, and almost all avalanche incidents can be avoided if we choose.

We give backcountry travelers the weapon of knowledge. In order to avoid triggering avalanches, backcountry travelers need:

Critical, up-to-date avalanche information.

Our avalanche advisories give the public critical avalanche information they need to make their life-and-death decisions in avalanche terrain and we forecast snow stability and weather trends into the future. Our information helps the public to decide what kind of terrain is safe, what kind is dangerous and we give them useful clues to look for when they venture into avalanche terrain.

The public can access these advisories in the following ways:

- Recorded telephone message updated each day
- Live interviews each day on three different public radio stations
- The Internet
- E-Mail
- In times of extreme or unusual avalanche conditions, we issue an avalanche warning that reaches all the broadcast and print media as well as NOAA weather radio.

Finally, we "preach the avalanche gospel" as much as possible to the local, national and international media. This season, for instance, several documentaries played on national television including the History Channel and the Weather Channel and National Geographic re-aired a previous documentary. The Forest Service Utah Avalanche Center staff is featured in all of these documentaries.

Avalanche education:

We teach about 30 free, basic avalanche awareness classes each season. These not only give the public an overview of the avalanche problem, but also some basic avalanche skills. These classes encourage the public to take a more involved avalanche class offered by the private sector.

How We Help Solve the Problem:

Just because people read or hear the information doesn't mean they listen. Therefore, we try to make the advisories entertaining so that people will remember what they read and hear and enjoy the experience enough to use the advisories regularly. We try and use all the standard tools of effective writing and speaking such as using active voice, first person, personal examples and stories to illustrate points, humor where appropriate and reading the bulletins in a natural voice, like talking to a friend. The recorded bulletins are informal, chatty and funny, yet informative.

We believe local forecasters do a much better job than distant forecasters.

Local people know local conditions better. They can get out in the mountains every day, they see weather and snow out their window and they talk with people on the street about it. Because of this, we believe that local people should issue avalanche bulletins for local areas, as long as they have the avalanche skills to do so. For this reason, four crews of avalanche forecasters operate in Utah, one forecaster operates in Logan, four in Salt Lake City, one in the western Uinta Mountains and two others cover the Manti Skyline and the La Sal Mountains near Moab.

We believe in a strong field-based program.

Avalanche forecasting is just as much art as science. And because of this, computers never have, and most likely never will, be able to forecast avalanche hazard as well as an experienced and skilled human being. Avalanche forecasting works best when the forecaster has an intimate, daily connection to the snowpack. We notice that the longer we spend in an office, the more out of touch with the snowpack we become. Therefore we always put in one or more field days before our forecasting shift, and we seldom have more than two forecast days in a row.

This is our philosophy and it seems to be working. More people access the FSUAC bulletin each season than any other avalanche advisory in North America, and the number keep increasing by an average of 20 percent per year. The numbers of people going into the backcountry keep increasing exponentially, yet the death rate has risen more slowly. We also see an increasing demand for avalanche education and information, not only by Utahans, but also by the national and international media.

We are very passionate about our work because it's more than a job, it saves lives.

A Look Under the Hood

The UAC is operationally separated into four entities:

- Bear River Range (Logan area – northern Utah and southeast Idaho)
- Wasatch Mountains (Ogden, Salt Lake, Park City and Provo area mountains)
- Western Uinta Mountains (Mirror Lake Highway, Weber Canyon, Evanston WY, Daniel's Summit)
- Manti Skyline (FairviewCanyon – Wasatch Plateau)
- La Sal Mountains (near Moab)

In his third season, Toby Weed staffs the Logan operation with Dave Kickert as an assistant. Kickert is employed by Utah State University. A generous contribution from the Utah State Parks funds this position.

Based in Moab, Evan Stevens and Max Forgensi forecast not only for the nearby La Sal Mountains but they also issue weekend forecasts for the Wasatch Plateau—Manti Skyline area. The Moab office is located in the Moab Ranger District on the Manti-Lasal National Forest and us supported by both the Moab Ranger district and a generous contribution from Utah State Parks.

Craig Gordon issues forecasts for the western Uinta Mountains and also does the lion's share of avalanche education for snowmobilers in northern Utah. This position is supported by a generous contribution from Utah State Parks.

Last, but not least, the vast majority of the backcountry use occurs in the Wasatch Range of northern Utah. A staff of four full time workers covers the Ogden, Salt Lake City, Park City and Provo area mountains—arguably the most heavily used mountain range in the U.S. Bruce Tremper, in his 18th season, is the Director. The rest of the very experienced Salt Lake staff include: Evelyn Lees, Drew Hardesty and Brett Kobernik. All are Forest Service employees under the Wasatch-Cache National Forest. The Salt Lake office is co-located with the National Weather Service at the Salt Lake International Airport.

Finally, a private, nonprofit group, the Friends of the Utah Avalanche Center, contracts a number of "volunteer" observers, who are reimbursed for their expenses at around $10.00 per day. They also hire the intrepid Bob Athey as a full time backcountry observer.

The Utah Avalanche Center is a Forest Service program under the Wasatch-Cache National Forest and the Manti-La Sal National Forest, in partnership with Utah State Parks and Recreation, Utah State University, the State of Utah Department of Public Safety, Division of Emergency Management, Salt Lake County, the National Weather Service and private contributions through the Friends of the Utah Avalanche Forecast Center.

The public can access the bulletins in the following ways:

Telephone:

Salt Lake City - (multi-line PBX system at the University of Utah)	(801) 364-1581
Logan (multi-line PBX system at Utah State University)	(435) 797-4146
Park City (multi-line PBX system at Park City Resort)	(435) 658-5512
Ogden (multi-line PBX system at Weber State University)	(801) 626-8600
Provo (multi-line PBX system at Brigham Young University)	(435) 378-4333
Western Uinta Mountains (courtesy of Utah State Parks)	(800) 648-7433
Alta (multi-line PBX system through the Town of Alta)	(801) 742-0830
Moab (single phone line)	(435) 259-7669
Manti Skyline (courtesy of Utah State Parks)	(800) 648-7433
Snowmobile hotline (courtesy of Utah State Parks)	(800) 648-7433

Radio Stations - live on-air reports each morning
KRCL 91 FM (7:50 am weekdays)
KPCW 92 FM ((8:06 am weekdays)
KCPW 105.7 FM (8:04 am each morning)

Internet:
http://www.avalanche.org (Avalanche.org is a non-profit avalanche web site run by the professional avalanche community in the U.S.)
http://www.wrh.noaa.gov/Saltlake (National Weather Service)
http://www.csac.org (Cyberspace Snow and Avalanche Center)
http://www.utahavalanchecenter.com (Friends of Utah Avalanche Center)

E-mail:
We offer daily automated e-mail of the advisories free of charge

To contact our office: (801) 524-5304 (phone)
(801) 524-4030 (fax)
e-mail: uac@avalanche.org

How We Generate Avalanche Advisories

We split our time more or less equally between the mountains and the office. For the Wasatch Range, a staff of four people rotate through the office in which one person comes in at 4:00 am to issue the forecast for the day while the others either head into the mountains to look at avalanche conditions, teach avalanche classes or come into the office at a more reasonable hour to work on various computer or education projects.

Field Day:
A typical "field day" might begin at 6:00 in the morning. Like most avalanche professionals, we click on our trusty NOAA weather radio shortly after getting out of bed for the latest weather forecast. Then, we fire up our home computer to look at the data from all the automated mountain weather stations. Like everyone else, we call our own avalanche advisory to get the latest information. Finally, after calling the forecaster for the day to check out, we jump in the car or on the bus and head for the mountains.

The forecaster in the field usually travels on skis or snowmobile or both, using all the usual safety equipment like electronic avalanche beacons, shovels, probes, belay rope and cell phones. We seldom have a regular patrol area, but simply go to the area that concerns us the most, or to a place that we know is representative, where we can safely look at snow on a variety of aspects, elevations and terrain types. We almost always go into the backcountry—meaning areas outside ski area boundaries where no avalanche control is done. Field days are often very labor intensive affairs, using climbing skins on skis to huff-and-puff to the top of a mountain, take off the skins, ski down into another valley, put the skins back on again, go to another ridge, and so on. Along the way we dig a number of "snow pits" in which we systematically test the stability of the snowpack.

Field information comes from many different sources, but the most powerful information usually comes from snow pits we dig on a variety of different slopes, or better yet, from profiles dug at the fracture lines of recent avalanches. A snow pit, like the name implies, is a hole dug in the snow about a 5 feet deep and 5 feet wide. On a smoothed snow pit wall, we perform a variety of stress tests to determine the stability of the snowpack and document the shear properties of weak layers. We also look at the crystallography of the various layers—crystal type, size, strength, water content and density, as well as measure temperature profile. Practiced avalanche professional usually take about 15 minutes for each snow pit. We would rather dig several quick pits in several areas than

do one detailed pit in one specific area because we want to know the distribution of the pattern so we can communicate the pattern to the public.

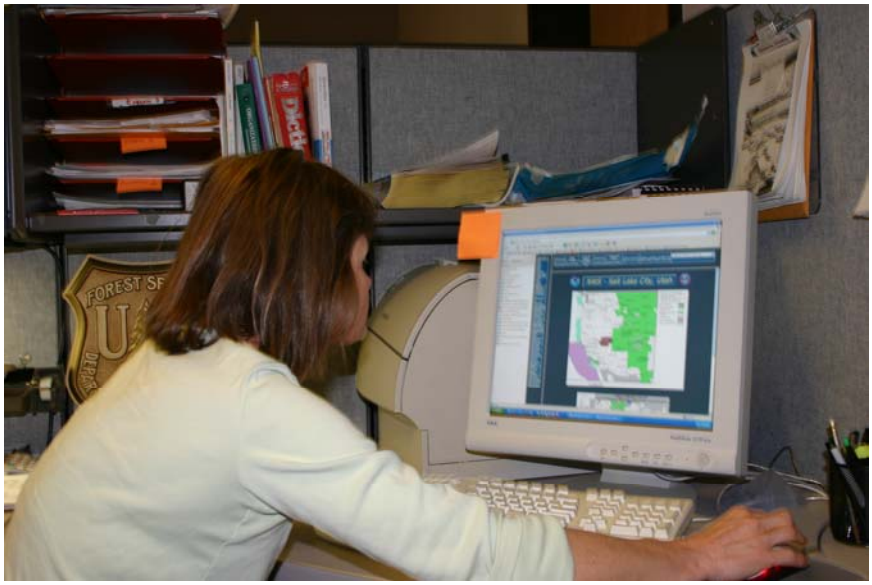
We also test the stability of the snow in other ways, such as sawing off cornices, which bounce down the slope, we keep close track of the pattern of recent avalanches and we always pay very close attention to the present snow surface because it's much easier to map a layer of snow when it's still on the surface then after it's buried by the next storm. Finally, when we get home, we write up our observation, graph the snow pit profiles and e-mail them to the avalanche center and also leave a detailed message on our answer machine in the office, which the forecaster will hear early the next morning. Often, we post photos of the day on our web site as well. Finally, each evening, we often call the person who will forecast the next day and talk to them in more detail, catch up on news of the day and bounce theories off each other.

It takes years of experience and training to be an accomplished avalanche forecaster, not to mention to be able to do it safely. Most of our staff have degrees in some kind of physical science such as meteorology or geology. We also have a number of years experience doing avalanche control at ski areas, plus, all are accomplished mountaineers with many decades of accumulated mountain experience and several are veterans of mountaineering expeditions throughout the world including Nepal, South America and Alaska. Finally, we all stay in top physical condition so we can efficiently cover lots of terrain.

Office:
The forecaster for the day wakes up around 3:00 am—earlier on storm days—and arrives at our office, co-located with the National Weather Service near the Salt Lake Airport, around 4:00 am. There's only one avalanche person in the office, so the pressure and time constraint is intense.

First, the lead weather forecaster for the National Weather Service briefs us on the general weather setup and then it's time to jump on the National Weather Service computers and give the weather an even more detailed look, so it can be adapted to specific mountain areas. Then, we check our answer machines, faxes and e-mails for field observations not only from our staff, but from a dedicated corps of volunteer observers, ski areas, helicopter skiing companies and highway control programs. Next, the forecaster has to face a blank computer screen and type up a detailed picture of snow stability and mountain weather and customize the advisory for five different zones in northern Utah. After the advisory goes out via e-mail and on the Internet, we begin recording the advisories into six different telephone systems, each located in a different local calling area for northern Utah and each one customized for a different area. Finally, we, do three live radio interviews. By 8:15 am, we're done and we collapse with relief, take that bathroom break we've needed for the last couple hours and take a walk outside and watch the sun rise and hope that our information is accurate. An average of 800 people call the avalanche recording and four times that number get it over the Internet, and many thousands hear it on the radio.

Then, just when many people are eating their breakfast, we eat lunch. After lunch—or is it breakfast—there's never a lack of telephone calls to answer, reports to write, spreadsheets and web sites to update, computer projects and media contacts. Finally, we issue the detailed mountain weather forecast by about noon, then head home by 1:00 pm.



Evelyn Lees gathering weather data.

Season Highlights

The 2004-05 season was unprecedented in modern Utah history with a record of eight avalanche fatalities in seven separate incidents. More avalanche fatalities reportedly occurred in Utah's mining days in the late 1800's and early 1900's at Alta and Bingham Canyon. But this season smashed records since accurate records were kept starting in 1950.

The 2004-05 season was so deadly because Utah experienced unusual weather patterns consisting of 3 weeks of clear weather that created weak layers followed by very large, very windy and very warm storms on a southerly flow. While most of the northern U.S. suffered under nearly no snow for most of the winter, very large storms blasted California, Utah and southern Colorado. Utah broke its 7-year drought in style with most mountain snowpacks ending up 150-400 percent of normal, and winter storms kept pounding Utah through mid May.

This season, we experienced a record-tying 158 reported, unintentional, human-triggered avalanches in the backcountry, 69 people were caught, 19 were partially or completely buried, 13 were injured and 8 people died in avalanches.

The Forest Service Utah Avalanche Center staff had a record number of 108 media contacts which include national and international television or print media interviews, and local television, radio and print interviews.

Brett Kobernik is the newest and youngest member of the Forest Service Utah Avalanche Center staff. We're excited to welcome a new forecaster with a long term commitment toward avalanche forecasting and a genuine interest in snow science. He worked as snow safety and as a helicopter skiing guide in Valdez, Alaska, was a backcountry ski and snowboard guide for Utah Exum Mountain Adventures for 8 years and he has worked as a product tester and designer for Voile Equipment in Salt Lake City. He also worked as an Avalanche Instructor and Field Observer for the Friends of UAC since the mid 1990's. In the field you'll see him on a split board, and in the office he's rapidly organizing our eternal clutter.

The National Weather Service introduced the Utah "Info Ex". This is a web based information exchange between many snow safety organizations. Ski resort snow safety programs that participated include Alta, Snowbird, Brighton, Solitude, Park City, The Canyons, Deer Valley, Snowbasin and Sundance. Other snow safety programs that participated were the Utah Department of Transportation teams in Big Cottonwood, Little Cottonwood and Provo canyons, Wasatch Powderbird Guides, and of course the UAC.

A ski patroller stands next to a large crown face near Solitude.

This season, we launched our Know Before You Go avalanche education program for young adults in Utah and it was a smashing success by all measures. The program consists of an action packed 15-minute DVD, followed by a 20-minute PowerPoint talk, all presented by a local avalanche expert. Craig Gordon provided the lions share of the impetus, creative energy and work behind the program. The KBYG program reached a record number of 12,000 people in eighty-one talks.

Use of Forest Service Utah Avalanche Center products continued to skyrocket this season with a record number of 1.7 million products downloaded from our web site. In addition, an we received an estimated 70,000 calls to the recorded avalanche advisory and thousands more who hear live interviews each morning on three different public radio stations.

We launched our new web site this season, which was a vast improvement over the old web site.

By all accounts it was a record setting season!

Access to UAC Products

This season, we experienced an incredible 113 percent increase in the total access to UAC products over last season with a total of 1.8 million products directly distributed to the public. Each season, less and less people access the advisory via the telephone recordings while more and more people use the Internet. Experts now estimate that about 60 percent of the people who access the Internet have high speed access, so it stands to reason that they can download more products, especially larger-sized files such as photos. This season, hits on the photos outpaced hits on the advisory. Also, this season, we offered more products than ever before.

We record telephone advisories for each of the local calling areas in northern Utah. The good news is that we don't have to pay for telephone lines or multi-line announcers because each recording is hosted by various telephone systems located in universities, ski areas and Utah State Parks. The bad news is that we can no longer count the number of calls received. So we don't have any good data on how the number of calls decreases as use of the Internet increases. Based on an extrapolation from when we could still count the calls, we estimate that the public calls the recorded hot lines around 70,000 times per season, but the numbers could be much lower than this. Regardless, the calls now represent a small percentage of the total public access to our products.

We do not know, however, the demographics of the callers. We suspect they may represent the more hard core users. Also, our web based survey this year hinted that people tend to monitor the advisory on the Internet during the week when they were at work, but they called the advisory on the weekends. So, despite the low numbers, the recorded advisory is probably still an important source of avalanche information, especially for rural users and people on the go. Also, uncounted thousands of people listen to our live interviews each morning on the public radio stations.

The Changing Face of the Media

We realize that the UAC must evolve in response to the changing landscape of the media. For instance, a page of typed text works well for the telephone recording and radio, but a mixture of graphics and text works better on the Internet, newspapers and television. This season we added even more hotlinks to recent photos, accident reports or maps. It seems like everyone travels with a digital camera these days and they all seem more than willing to e-mail their photos of avalanches and avalanche phenomenon. We hot linked as many photos as time allowed on our advisory and posted many of the good ones on our photo list.

This summer, we plan to completely reinvent our avalanche advisory and design it expressly for the Internet. We plan on adding graphics that show avalanche danger by aspect and elevation, expected future trend, avalanche probability and size and also, add icons that indicate various avalanche concerns. All this will be mixed with text in more bite-sized blocks. The avalanche phenomenon particularly lends itself to graphical displays and the Internet is perhaps the perfect medium to communicate avalanche information and to teach the public about how avalanches work. The possibilities are endless, but of course, the funding is not. Each year, we plan to budget a small amount of money to keep our products fresh, relevant and effective.

Thank you to everyone who contributed to make the Utah Avalanche Center possible.

The Forest Service Utah Avalanche Centers would not exist without support from a broad base of partners and the public. This brief thanks does not represent the value of what each of these entities contributes to our program. Many of these organization's long term commitments have lead to the stability of the Forest Service Utah Avalanche Forecast Center and allowed us to expand our forecast area and pursue innovative communication and education programs. So however small this thanks is, we would like to acknowledge the following people and organizations.

State of Utah Natural Resources Parks and Recreation Division for almost single handedly funding three avalanche programs - the Western Uintas, Manti Skyline and the Logan area mountains – to the tune of $82,000/year. In addition, they generously supported the Know Before You Go education program with the loan of a power point projector and an additional $36,000, plus the printing of snowmobile specific avalanche brochures.

The Friends of the Utah Avalanche Center keeps our engine running, filling in numerous gaps in our funding, from staffing to observers, education projects and equipment, often raising and spending over $50,000/year.

They coordinate innumerable fund raisers and function as a 501c3, smoothing the way for potential partners to work with us. A very special thanks to the volunteer board for all their hours of work and to the miracle worker **Colleen Graham**, chair.

Black Diamond Equipment, the company that started it all, both on a local level and as a model nationwide for company partnership with avalanche forecast centers. It's not just the $8000 they kick in each year, the hundreds of hours of staff time, or the hosting of the annual fund raising party, but also the way they bring the outdoor community together.

The Byrne Family for their annual financial donation to the Friends of the Utah Avalanche Center. Put this one after BD, as that's what puts us over the top financially at that party.

National Weather Service for their generous and long term in-kind support of office space and office supplies, not to mention the unlimited access to personalized mountain weather forecasts!

Snowbird Ski and Summer Resort for hosting the wildly successful Know Before You Go fundraiser with The Friends, raising about $15,000, and for hosting Backcountry Avalanche Awareness week.

Salt Lake County for their generous long term support of $20,000/year.

State of Utah Division of Comprehensive Emergency Management, one of our oldest dependable partners, who contributes generous $25,000/year.

Backcountry.com donated $5000, some of the original seed money to start the Know Before You Go program, plus annual donations of a portion of their sales.

The Utah Snowmobile Association partnered with the **International Snowmobile Association** for a $4000 grant for the Know Before You Go Program and donated $1000 toward the Moffit Peak weather station.

REI provided space for the Friends annual ski swap, rooms for avalanche awareness talks, and a $3000 grant for Know Before You Go.

Uinta Brewing Company for a donation of $1200.

Wasatch Backcountry Rescue donated a power point projector and a laptop to the Know Before You Go project. With help from **Red Pine Rescue** and **The Canyons,** they also bought and operated two avalanche training Rescue Training Centers, open to the public.

Backcountry Access donated a complete Beacon Basin, an avalanche beacon training center that was installed at a snowmobile trailhead in the Uintas. Each year they also loan us avalanche safety equipment for teaching and demonstrations.

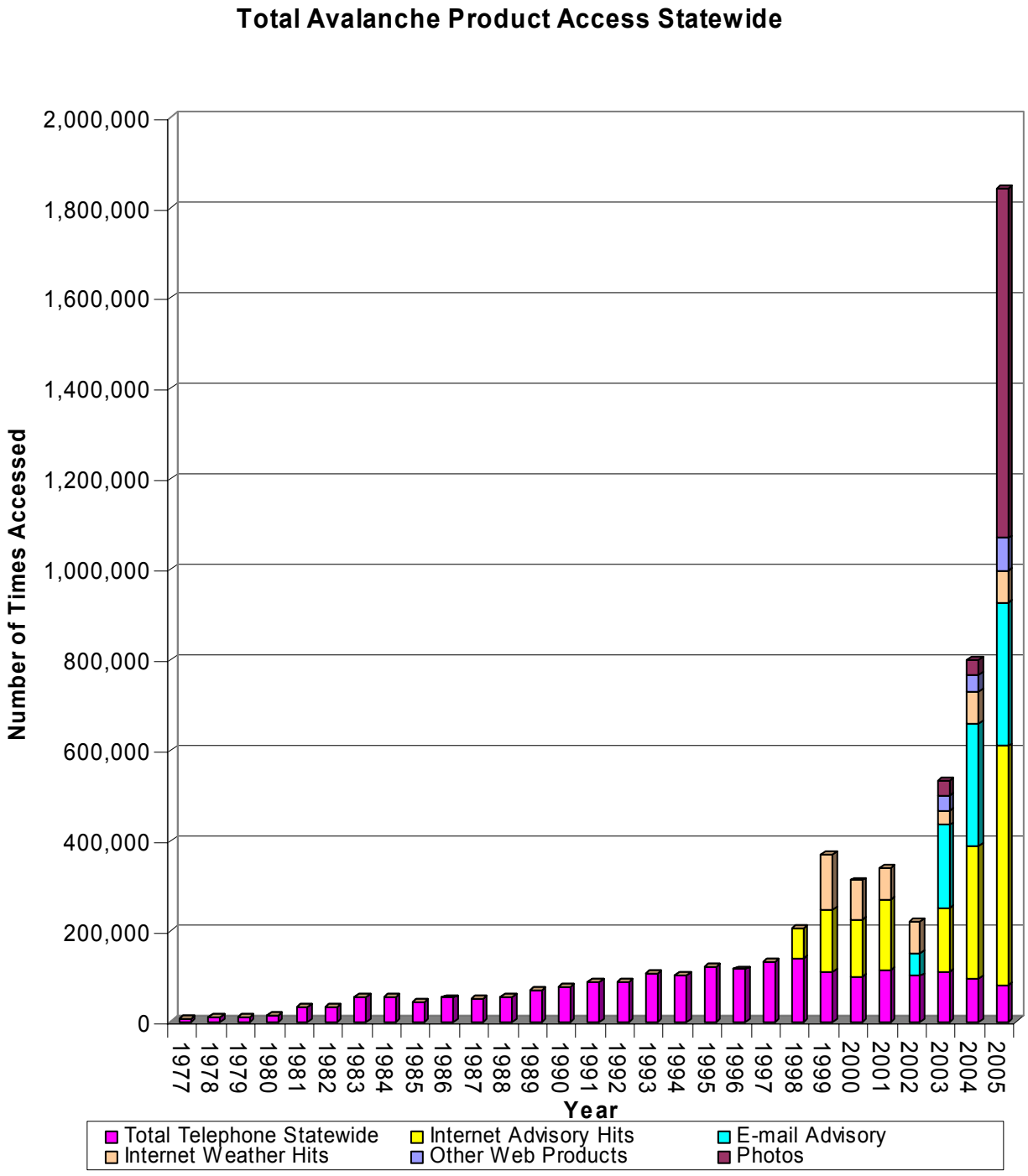
Thanks to our phone line partners: **University of Utah, Brigham Young University, Weber State University, and Park City Ski Area**, allowing us to use their dependable and high quality phone systems for avalanche forecasts.

Deer Valley, Brighton and **The Canyons** who each donated $1000 to the Know Before You Go avalanche education program.

Utah State University for use of their phone lines and for observers/ forecasters salary.

Bear River Outdoor Recreational Alliance donated $250.00 towards the Moffit Peak weather station.

And of course, all of our **individual supporters** who support the Friends of the UAC with their annual financial donations and their volunteer time, we couldn't do it without you.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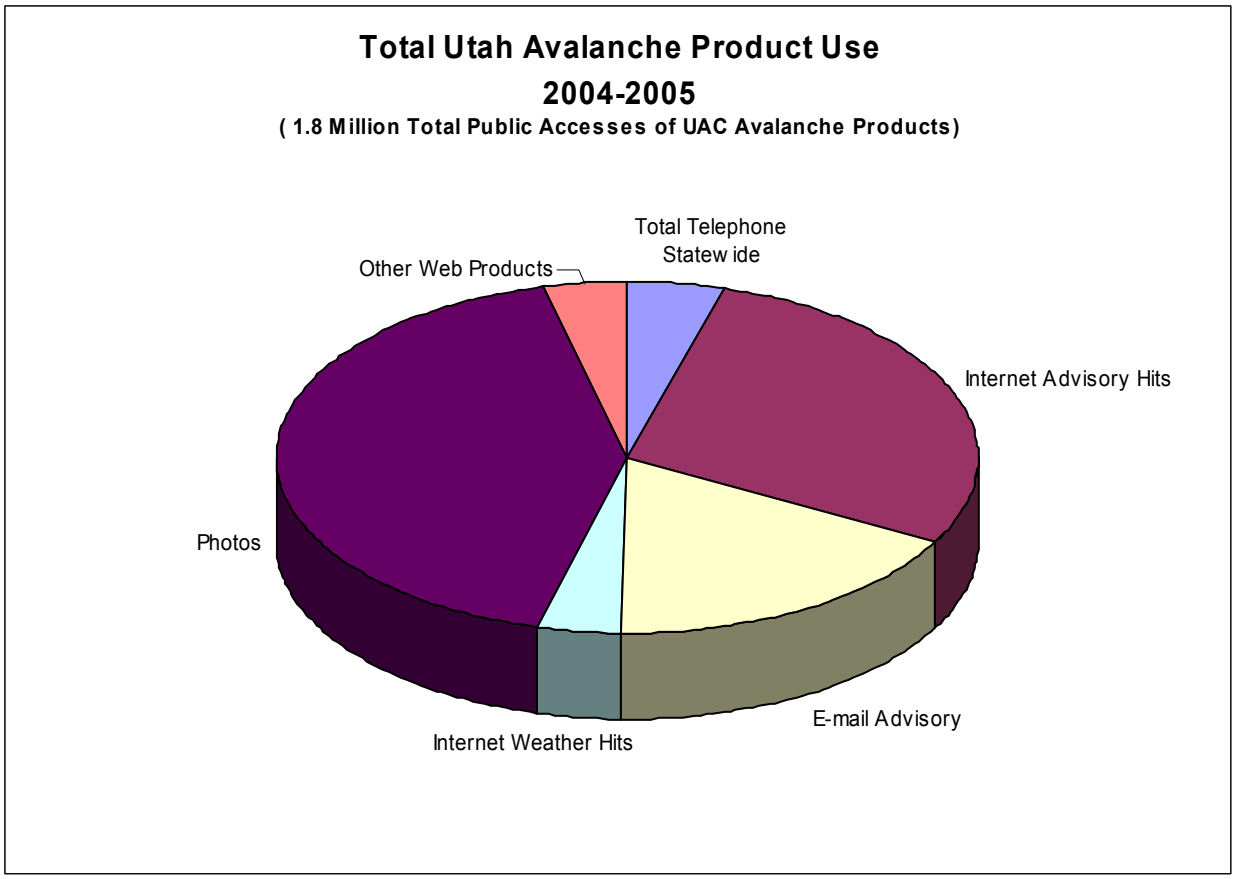


Silver Fork., Photo: Mike Olson

The "Know Before You Go" Program

History:
The program was born out of the need to target young adults who travel in avalanche terrain that, often times, have neither the proper safety equipment- avalanche beacons, shovels, and probes- nor much prior avalanche education. In many cases, just having basic avalanche awareness skills and being able to recognize obvious signs of snow instability can help save someone's life.

We aimed our sights at young adults in Utah for two reasons. First, it's a critical target group to reach because more and more young people are going beyond the ski area boundaries in search of powder, steep terrain, and big air. Unlike years past when skiers flailed they're way down backcountry slopes on skinny skis and flimsy leather boots, today's gear is high-tech. Advances in equipment have made it possible for even novices with very little backcountry experience to quickly access avalanche prone terrain. Herein lays the problem. The gear has advanced, but peoples avalanche skills often times can't keep up with the rapid improvements of technology. This phenomenon isn't ski exclusive. If you look at snowboards, snowmobiles, and even snowshoes you can see advances in technology make it easier for people to excel on these snow tools at a rapid pace. This education program was designed to reach out to all user groups.

The second need for a young adult program has become obvious by the escalating numbers of teens being killed in the backcountry by avalanches. While the Forest Service Utah Avalanche Center (FSUAC) teaches dozens of free avalanche awareness classes to thousands of people each year, few teens attend these. In the past three years, five teen avalanche fatalities- in two separate events- may have been prevented with just some basic avalanche awareness skills. One tragic avalanche in particular occurred just after Christmas on December 26, 2003. Fourteen people were recreating in the runout of one of the largest avalanche paths in Utah, near Aspen Grove, after an intense snowstorm. Unfortunately, three young snowboarders were buried and killed by a massive avalanche. This avalanche gained both local and national media coverage.

Shortly after this tragedy, Craig Gordon a forecaster with the FSUAC decided something needed to be done in terms of educating this age group. He proposed an idea to Bruce Tremper, director of the FSUAC, to develop a program specific to young adults in the state of Utah. The best way to accomplish this would be to go right to the source- junior highs, high schools, and colleges- and preach the avalanche gospel to the masses. Bruce agreed this was a great idea but, where would the funds come from, and who would undertake such a massive project? As with most federal agencies the FSUAC gets by on minimal funding and personnel.

Convinced that this was a critical program, both Craig and Bruce worked on a business plan. It was decided early on, that the program would last for about an hour and to keep teens attention it needed to be fast paced and energetic. The presentation would be given in three parts. An avalanche professional would go to a school assembly and start off with a 15-minute, narrated video that would show avalanches, people triggering avalanches, and the destructive power of avalanches. Next, they'd tell a dynamic story about a close call they had and what they've learned over the years. The presenter would follow this up with a 15-minute PowerPoint presentation about avalanche basics. A question and answer session would wrap up the assembly.

On paper and in theory this all sounded good, but several challenges lay ahead. How would we get into the school system, who will do all the leg work for avalanche footage and develop a video, and finally the age old question… where will the funding come from? With the backing from the Friends of the FSUAC, Bruce proposed they hire Craig as a contractor for the summer and he would be in charge of coordinating the program. Bruce would act as a technical advisor to the project. It was early June and now the clock was ticking to get this project off the ground.

Partnerships and Funding:
The Friends of the FSUAC had enough money to pay Craig Gordon through the summer and working under the auspices of the "Friends", Craig had several ideas in mind when it came to funding. The cleanest way to get donations would be to approach the private sector and a friend at Backcountry.com was the perfect connection. Craig proposed the idea to Bob Merrill and Dustin Robertson of Backcountry.com. Both expressed interest and agreed

this would be a great way to support avalanche education. In fact, they had already ear marked several thousand dollars for a project like this. They trusted the reputation of the FSUAC and thought we had the expertise to give this program the attention to detail it deserved. Backcountry.com came through and planted the seed money which got the project underway. Still, we were very under budgeted and getting funds to make this project become a reality was still the biggest hurdle. Little did Craig know this would pale in comparison to what waited down the road. Piece by piece though, donations started to come in as people began to hear about this exciting new project.

R.E.I. who has been a partner with the FSUAC for many years, providing space for the annual ski swap fundraiser as well as sponsoring our free public avalanche awareness talks, were the next partner to come on board.

Craig, who has taught several thousand snowmobilers about avalanches in Utah and has a great working relationship with the Utah Snowmobile Association (USA), approached the USA with his education idea. Bridging the gap between motorized and non-motorized users, the USA stepped up to the plate and applied for an education grant from the International Snowmobile Manufacturers Association (ISMA). This organization represents the four major snowmobile manufacturers and has two grant cycles each year, in which they grant monies for certain projects, usually education or safety related. This was the first avalanche project of its kind to ever receive grant monies from this organization. This unto itself was a major breakthrough for the program because it showed the strong commitment the snowmobile community has to avalanche safety and the well developed partnership the FSUAC has with the USA.

Finally, in the fall, Utah State Parks and Recreation came on board as a partner and donated more money than all the other partners combined! The relationship with State Parks and particularly Fred Hayes who is the OHV coordinator, goes back several years and has been a fruitful one for both parties. This donation was key to the longevity of the program and all the hard work that went into it.

Program Development:
All the time partners were being sought, Craig worked on opening the door to the school system. The only types of programs that had been welcomed by the Utah schools on a massive scale were those that taught drug, alcohol and tobacco avoidance. This was a different type of program for the school system and most everyone Craig spoke with wished him "good luck" in this arena. Obviously one of the biggest hurdles to overcome was how to get into the school system? First we needed to develop a program that was not only dynamic and entertaining to keep students attention, but also met enough school curriculum criteria that administrators would embrace it. Craig met with the Board of Education and while they agreed this was something needed in Utah schools, no one would go out on a limb to fully endorse this pilot program. So Craig wound up spending many an office day with a phone glued to his ear, making cold calls, trying to convince school principals this program was needed. A few principals saw the need and started booking talks, but mostly everyone was more interested in talking to us in the fall.

The Video:
Early in the planning days, Bruce thought the program needed a high energy video to captivate the audience and show them what avalanches look like when they're moving and their destructive power. After all, most people have never even seen an avalanche and how can all that nice fluffy powder snow hurt anybody? The FSUAC didn't have any footage, so going off a list of footage we knew was out there, Craig began making contacts. The phone was like an extra appendage on Craig's head all summer. When he wasn't talking to schools or potential sponsors, he was doing plenty of detective work, tracking down photographers with avalanche footage for the video. Next was the job of convincing the photographers to let us use their footage at no cost, for a project which had never been done before. Fortunately, both the reputation of the FSUAC as well as the need for a program like this superseded the desire for photographers to sell their footage to us. Nearly every piece of footage used was given for free to this project- with the understanding the video wouldn't be available for resale.

High quality avalanche footage isn't an easy commodity to come by, but several photographers did send us their footage, though to begin with most of it was from helicopter avalanche control work. Spectacular avalanches to be sure, but what we needed were shots of skiers, boarders and snowmobilers triggering and getting caught in slides to illustrate our point. Craig made a contact with Dirk Collins from Teton Gravity Research Films (TGR)

and the rest is history as they say. Dirk wanted to help out and his avalanche footage was the real deal. Plenty of skiers and borders getting caught in slides and this was just what we were looking for. Over time, more footage came in from Steve Kroschel, Steve Winter, and Richard Cheski. Craig also found some good rescue footage from KTVX News 4 Utah and KSTU Fox 13 News Utah, two local Salt Lake stations.
The most difficult avalanche footage to find was that of snowmobilers triggering or getting caught in slides, but through his channels, Craig learned where he could get some great shots. Jim Phelan sold us a spectacular clip of a snowmobiler triggering and trying to outrun a large slab avalanche, though eventually gets caught and buried. David Craig and Greg Painter also provided us with outstanding avalanche, action and "sick air" footage, helping to round out the piece.

It was decided that John Plummer a film editor from Sun Valley Idaho, who already had some stock footage and worked on two other avalanche videos for the Forest Service National Avalanche Center, would edit the piece. When Craig had a suitcase full of footage, he headed to John's studio and they started digitizing the footage. The first meeting was in the second week of July and shortly thereafter the first rough cut of the video appeared in SLC. It wasn't quite what Bruce and Craig had envisioned, but it was just a rough cut after all. More footage was gathered and overtime, the piece started to come together. The video probably went through a half a dozen edits and Craig had focus groups of teens watch it for critique. As we started to get the content nailed down to the point where we were becoming proud of the product, we showed it to the first large and most critical audience. No, not teens, teachers, or school administrators… other avalanche professionals at this year's International Snow Science Workshop. Talk about a tough audience! For Craig, it was like a premier night on Broadway. The film passed the sniff test and was well received. As a matter of fact, all our colleagues from other avalanche centers in the US and Canada wanted a copy!

The video went back to the editing room for a few minor tweaks and now the clock was really ticking….it was mid September and schools were back in session. We got what we thought was going to be the final edit of the video done in the next few weeks. The "final edit" was shown to a group of avalanche professionals in mid October for one last critique. While the changes were minor, it did mean going to the edit room one more time. Also, during this time Craig began showing the video to school administrators and they seemed happy to embrace the program.
Finally, by early November a finished product came through, which was good because word was getting around about this dynamic new program and the first official presentation was Nov.9th.

Personnel, Presentations and Scheduling:
The first year objective of the "Know Before You Go" program was to reach out to 5,000 students. Craig and Bruce realized to accomplish this goal there would need to be a team of presenters and it was determined early on that those giving the talks had to be avalanche professionals. We wanted to uphold a high standard with the people we choose to present the program in order to not only provide a quality product, but to also be able to handle tough questions. Snow safety isn't rocket science, but you do need a number of years in the saddle in order to explain its intricacies. The Wasatch is full of numerous experienced snow professionals and many have a close working relationship sharing snow and avalanche observations with the FSUAC. These would be the people we'd ask to help us with the presentations and offer them a modest stipend for their efforts. All tolled, eleven snow professionals ranging from snow safety directors, to ski patrolman, and retired forecasters, including Craig would give the talks. The program was well represented with snow professionals from Ogden to Payson to Park City to Salt Lake City. Up north, ski patrol personnel from Snow Basin included Doug Wewer, Jeff Hirshi, JR Fletcher, and Aleph Johnson-Bloom. In the Salt Lake area Dean Cardinale, Dusty Sackett and Derek Nipkow from Snowbird as well as Gabe Garcia from Alta helped to cover a bulk of the talks. Tom Kimbough, a retired FSUAC forecaster also helped out on occasion. Darce Trotter who worked as snow safety and ski patrol director at Sundance for nearly two decades helped with presentations in both Provo and the Heber Valley areas. In Park City, it was a natural choice to have Jake Hutchinson help us out. He's the snow safety and ski patrol director for The Canyons.

Craig took care of booking almost all of the 79 presentations for the season and did 38 of the talks. Along with forecasting during a historic avalanche year and talking to other groups about avalanches, he was a busy guy!

Media:
The Know Before You Go program received a well deserved amount of media coverage through print, TV and radio. In October, the New York Times did an article in the travel section about backcountry skiing and Craig's new program got its first national exposure. Shortly thereafter, CBS National News was contacting Craig, wanting to schedule an interview come winter. The innovative new program was getting known and this helped to further establish its credibility.

On the local level, over the years, Craig worked with the media outlets in regards to other avalanche awareness issues and developed a trusting relationship. He turned to them to help get the word out across the state. At the first school presentation, the cameras and reporters were there covering every move.

February Fundraiser:
The Friends of the FSUAC under the direction of Colleen Graham, help support the avalanche center financially by holding two separate fall fundraisers. One of these events is a giant bash supported by Black Diamond Equipment and annually raises $30,000. The other, is a ski swap that REI helps to support by providing space at their 33rd South location for free. This swap annually raises $9,000. These two fundraisers help the center out immensely, but last year, Roger Kerr, a ski instructor with Snowbird Ski Resort, approached the friends with some additional innovative fundraising ideas. He proposed holding a "black hat" fundraising dinner at Snowbird along with a silent auction, which would target a different demographic than the other events. The first year was a success with 60 people attending and proceeds went to help the avalanche center. This year though, it was decided that proceeds would support the "Know Before You Go" program. Both Roger and Colleen's Herculean efforts made this year's fundraiser an amazing success. Guest speakers included Apa Sherpa and Lhakpa Rita, who have summitted Mt. Everest fourteen and seven times respectively, Dick Bass, Governor Huntsman, and keynote speaker David Breashears who gave a riveting slide show about his Everest experiences. The support of the program was reflected by the sell out crowd of 400 people who, along with the media, attended. Nearly $15,000 was raised during this one night event. Due to popular demand, we're looking at a much bigger venue for next year!

Program distribution:
The program was designed to be shared with any avalanche center, state or government entity, or local avalanche educator who provides free avalanche awareness education to the public. 85 copies of the DVD and PowerPoint were sent across the US reaching out to thousands of people. The program was also adopted by the Canadian Avalanche Association, where several thousand people had seen the presentation so far. Late this spring the program went international with the French avalanche center requesting the video for their avalanche education efforts.

Craig Gordon talking to over 600 students about avalanches at Jordan High School. CBS News filmed this presentation for an "Eye on America" national news segment. CBS News photo

Future Direction:
We would like to see the "Know Before You Go" program become a mainstay in the Utah school system and Craig will work with the Governors Office and Board of Education this summer to try to make this come to fruition. Craig would also like to develop a cool, interactive, state-of-the-art web site that students across the country could visit to hone their avalanches skills at home before venturing out on the snow. In the big scheme of things though, we would like to see the program become more available to a wider audience nationwide, especially in mountain communities. Of course additional funding is needed to accomplish these lofty goals and this is yet another project Craig will be working on over the summer.

Wasatch Season Summary

Weather, Snow, and Avalanche Incidents

The winter of 2004/2005 was an avalanche season of historic proportions. While most of the rest of the West had below average snowfalls, the upper Cottonwoods recorded over 700" of snow. A weak El Nino helped in part set up a pattern of storms moving through southern California, kicking strong, wet, and windy storms into Utah. This type of flow more or less evenly blanketed the mountains of northern Utah with even amounts, as the Provo and Ogden mountains kept pace with the usual breadwinners in the Cottonwoods. Twenty one storms of at least 12" were recorded over the season that effectively began on October 17th. By issuing our earliest ever avalanche statement three days later, the avalanche season was off and running. A Utah-record eight people were killed in the backcountry this year, doubling our annual average of four and smashing the old record of 6, set in 96/97 and 00/01. Backcountry recreationists unintentionally triggered 158 avalanches. In these, 69 people were caught, 19 were fully or partially buried, and 13 sustained moderate or severe injuries. (**These numbers include Uinta/Logan data**) We issued thirteen Avalanche Warnings or Special Avalanche Statements over the course of a winter that left even the old timers scratching their heads.

OCTOBER

After a few early storms in September and October that brought snow to the mountains, winter kicked into high gear on October 17th with measurable snow falling every day but one through Halloween. Alta ski area recorded a phenomenal 122" of snow over those two weeks with 14.85"of water. Much of the deluge came in warm on a southwesterly flow which evenly blanketed the northern mountains, but kept the snow levels around 8000' and higher. We looked back to the old Atwater/LaChappelle records dating back to 1945 and confirmed that not only did we smash snow and water records for October, but did so in just two weeks! We went through a couple small natural cycles, but for the most part, instabilities settled out rather quickly. Also of note was a rime crust deposited on the 29th, which factored into a number of the slides around the turn of the month.

NOVEMBER

If October went out like a lion, November came in like a lamb. Except that it stayed that way for most of the month. By comparison, snow and water totals at Alta were a paltry 59.5"/4.51", leaving us feeling like we'd started the season in a sports car, only to run the second lap in a three cylinder Yugo. Clear skies and cooler temperatures kicked in the faceting process on the surface and provided the northern mountains with at least one and, in some areas, two layers of surface hoar. The faceting on the surface allowed the riding conditions to remain good for much of the month as we thanked our lucky stars for the prodigious early and dense snowfall that prevented depth hoar from forming at the base of the snowpack. A couple of back to back storms just after Thanksgiving added over 40" of snow on top of the weak surface snow and the party started. The danger quickly jumped to High, with numerous natural and human triggered slides occurring in the backcountry during this cycle. The instabilities remained persistent, as human triggered slides occurred every day into early December, ahead of the next blockbuster storm.

DECEMBER

From December 7th-9th, an unusually warm, moist, and windy storm slammed the mountains of northern Utah with over 40" of snow and nearly 7" of water weight. Accompanying winds were sustained at 25-45 mph out of the southwest and west, prompting our office to issue an Avalanche Warning on the 8th and keeping the danger at High or Considerable for the next several days. Not surprisingly, the heavy snow and strong winds made for perfect avalanche conditions, falling on the thinly buried November facets and surface hoar and our first major cycle of the year was under way. Unfortunately, the old aphorism about most avalanches occurring during the storm and most avalanche incidents occurring on

Photo: Bill Farley

the first few sunny days after the storm held true. Between December 10th and 11th, we recorded four fatalities in three separate incidents with two very near misses. On December 10th, a 24 year old skier triggered and was killed by a 1-3' deep avalanche while traversing back to Twin Lakes pass. The next day, two snowshoers were killed in upper Mineral Fork of Big Cottonwood Canyon as a large avalanche engulfed them in the valley bottom. It was not known whether it was a spontaneous avalanche or whether they triggered the slide from below. Also on the same day, forty miles to the east in the Uinta Mountains, a snowmobiler triggered and died in a very large avalanche above Strawberry Reservoir, in a drainage called Trout Creek. In the Bountiful mountains, a snowmobiler filming his friend riding up a steep slope was buried in a large slide triggered by his friend. Buried for 20 minutes and losing consciousness, he was extricated, resuscitated and survived with minor injuries. Backcountry recreationists continued to trigger avalanches until the 13th. Most of these were 1-4' deep and a couple hundred feet wide, many were remotely triggered, with some taking out the previous run's tracks.

A day after Christmas, a strong southerly flow developed, literally shaking the Wasatch with sustained 30-40 mph winds along the ridgelines and even damaging most slopes at the mid-elevations, making the snow surface conditions complex with crusts and patches of weak faceted snow on the more protected shady slopes. Heavy snowfall began on the 29th and lasted through the 2nd, with snow and water totals of 68"/6.83". Favored by this type of flow, the southern end of the Park City ridgeline took the brunt of the storm, and by the 30th, we had issued a Special Avalanche Advisory with a HIGH danger in the backcountry. A natural avalanche cycle was underway with the strong southerly winds with a few notable very close calls following into the New Year.

JANUARY

The most notable incident occurred on the 1st in the Hell's Canyon area, an out-of-bounds area adjacent to the Snowbasin ski area. A party of four entered this steep northerly facing slope, triggering a 1' by 400' wide avalanche, carrying three of them nearly 2000' down the path. They made a large withdrawal from the karmic bank as none of the individuals were wearing transceivers and miraculously ended up only partially buried. One sustained a fractured femur and pelvis. Each extracted themselves from the debris only to straggle out of the way as another ski party triggered an even larger avalanche down upon them. In Park City, ski patrol teams were finally able to get up into the higher terrain and reported slides up to 12' deep off the Jupiter ridgeline taking out trees in the runout zones. And as icing on the cake, dormant layers of faceted snow became reactive as three slides broke into old snow, with one lucky snowboarder escaping with only a knee injury after washing over some cliffs in the Brighton backcountry. Another monster, triggered remotely on the Park City ridgeline was 2-4' deep and 300' wide, taking out the entire bowl.

Large crowns like this one in West Monitor were the norm for 05-06

After a few days to catch its breath, the next series of storms on a southwesterly flow pushed into northern Utah with storm totals of 47"/1.97" from the evening of the 3rd until the afternoon of the 6th. The snow fell right side up with storm densities an amazing 4-5%! Those out playing in the mountains said it was the best snow of the year. Again. Half-way through the cycle, a skier triggered a deep slab in Main Days and was carried nearly 1000' down to the flats, apparently unscathed. This was only a portent for things to come with the next series of storms through the 12th. Between January 7th and the morning of the 12th, another wet heavy storm on a southerly track slammed the Wasatch with 52"/7.78". Strong southerly and then westerly winds accompanied the onslaught and by the afternoon, of the 7th, the danger jumped back to HIGH. Two days later, a snowmobiler and snowboarder died in separate incidents on the Wasatch Plateau not 20 miles apart within an hour of each other. By the morning of the 10th, the Provo Mountains shed much of their winter coat during a widespread natural avalanche cycle. With control work Slide Canyon crossed the Provo Canyon road three times, Bridal Veil naturalled into and then dammed the river, and three class five avalanches ripped out off of Elk Point, running over 4000', taking out mature timber and obscuring the lower part of the alpine loop road. Things were only beginning. Between the 11th and the 16th, natural, human and explosive triggered avalanches pulled out avalanches down to the faceted snow from November up to 10' deep, with some running half a mile. Finally, with good weather 13th, one could see the aftermath and carnage from one of the most dramatic cycles in years from Provo to Logan. 100 year old trees were taken out, new avalanche paths were created, and even the old timers were left scratching their heads. Control work pulled out 4-7' deep avalanches in heavily

compacted terrain, with one naturalling down to the same faceted layer overnight at one of the ski areas. On the bluebird afternoon of the 14th, a tragedy occurred in Dutch Draw that made national news. In a backcountry area adjacent to the Canyons resort, a skier triggered a 6-8' deep avalanche 700' wide that consumed him and an unknown number of others on the slope and down below. Witness reports conflicted, but some insisted they saw several others on the slope. Search and rescue efforts continued for another couple days until the sheriff's department determined that no other bodies were believed to be buried in the slide. High pressure built for the remainder of the month as the dreaded January inversion capped the valleys with smog while the bluebird sang the approach of our second corn cycle of the year.

Bruce Tremper investigating yet another huge avalanche.

FEBRUARY

While high pressure slowly closed the chapter on the last series of avalanches, it also started the screenplay for the next. On the 5th, surface hoar blanketed the already weak recrystallized snow from the last snows in January. In many areas, these few inches of snow sat on old slick bed surfaces from the January cycle, and now we were just waiting for the next storm. Over the 6th and 7th, 24"/1.26" provided the slab and we were back in the game. It snowed nearly every day between the 11th and the 20th, with the storms saving the best for last.. It was enough to tip the balance, and our next natural cycle was underway, with 2-4' crowns, some up to 2000' wide littering primarily the north and east facing slopes. Remotely triggered slides were de rigueur with the newly buried persistent weak layers, with some notable close calls. For the month, backcountry travelers unintentionally triggered a total of 32 slides, two of which were captured on video by upstart backcountry ski film production companies. The most noteworthy footage showed a skier triggering a wind pocket in his first turn off the summit of Mt. Superior in Little Cottonwood Canyon. He was caught and carried for over 2000', and remarkably survived with non-critical injuries. High pressure again set in from the 21st on, leaving us snow totals 79"/6.88" for the month.

MARCH

High pressure pushed on into the first two weeks of March, allowing folks to knock out those long desired supertours and technical descents. Finally after about three weeks of good weather, the ridge was replaced by a moist westerly flow that kept the faucet on through early April. The third week brought some teaser storms of 10" and 5" until it started snowing in earnest, snowing nearly every day until the turn of the month. An early dry and soporific March ended with 180"/13.5". At least 10 people were caught in backcountry slides, with some very close calls. On the 31st, the first beautiful day after the onslaught, a 27 year old snowmobiler was killed in an avalanche he triggered in the Monte Cristo area in the Ogden Mountains. Investigation found that he had triggered a 4' deep by 550' wide avalanche on the faceted snow from March. His death brought our total of fatalities for the year to eight.

APRIL

Around the turn of the month, an unsettled southwesterly flow set up over northern Utah that alternated periods of wet and dry avalanches. The strong spring sun and warming temperatures immediately provided the impetus for wet point release and wet slabs on the usual sunny aspects, as well as some of the northeast and northwesterly aspects. By mid-April, backcountry skiers began triggering corn slab avalanches, avalanches on a still-supportable frozen layer, usually 8-16" deep and up to 150' wide onto unconsolidated wet grains. Most were on southeast facing slopes between 9000' and 10,000'. April's snow and water was 76.5"/6.68" and the inevitable spring warm up was pushed off into May.

MAY

True to form, the season refused to die and we kept getting regular snow storms through the first two weeks of May. We had to look back in the records to 1983 to find a deeper snowpack for so late in the season. At least five human triggered avalanches occurred in May with several close calls. A strong warm up finally came in mid May and although we had finished our avalanche advisories at the end of April, we issued a press release for wet avalanches, which occurred in abundance over a busy weekend. Luckily, we didn't hear about any incidents. Then, after more cooling and snow, we had another strong warm up in the third week of May with several large, wet slabs reported. We issued our final news release of the season on May 24th, by far, the latest we have ever issued any avalanche information. As of this writing on June 1st, the wet avalanches have finally settled out and we hope that this is an end to the longest season we have ever known, the most avalanche fatalities and the greatest number of unintentionally triggered avalanches in the backcountry. We're ready for a rest.

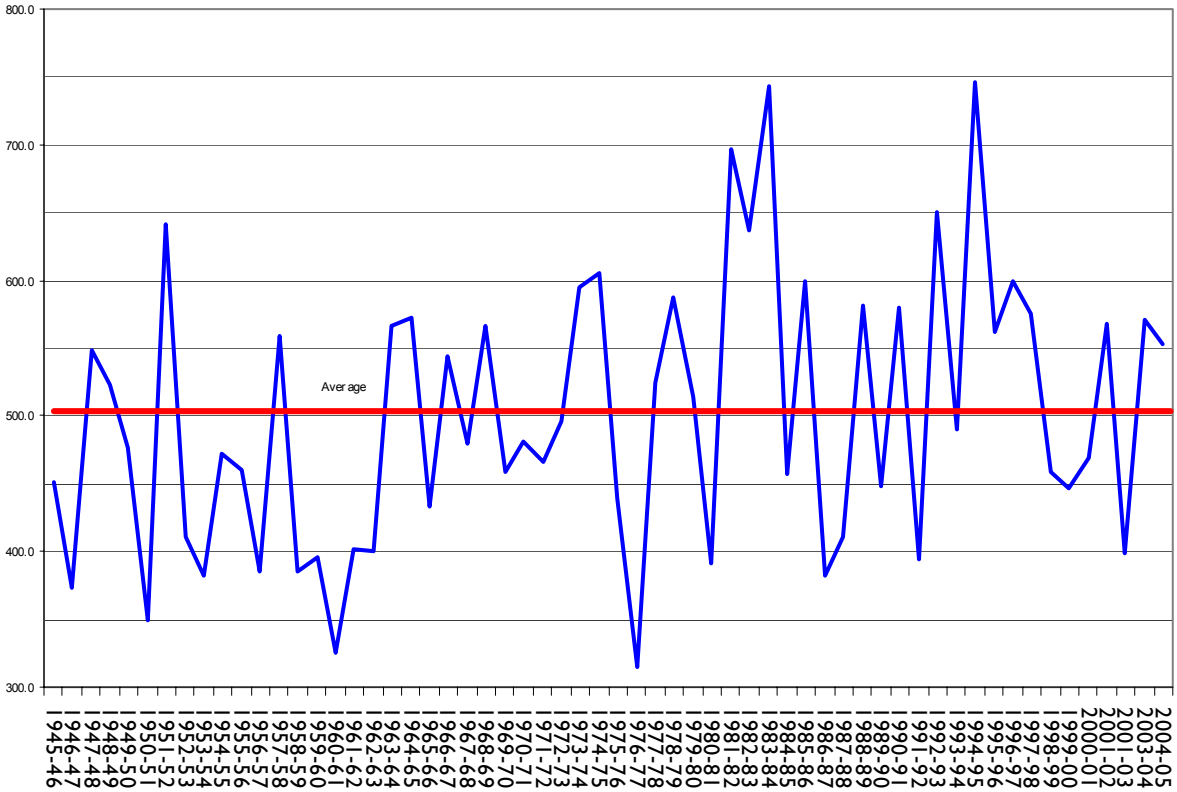
Large crown in Silver Fork...more of the norm.

Snowfall at Alta 1945 - Present

Season	November	December	January	February	March	April	Total
1944-45	---	57.0	19.5	67.0	---	57.0	
1945-46	109.0	83.0	84.5	50.0	69.0	55.5	451.0
1946-47	69.0	63.0	61.0	53.0	68.0	60.0	374.0
1947-48	118.0	80.0	46.0	66.0	165.0	74.0	549.0
1948-49	71.0	160.0	132.0	58.0	97.0	5.0	523.0
1949-50	39.0	137.0	133.0	34.0	109.0	25.0	477.0
1950-51	60.0	66.0	112.0	58.0	53.0	0.0	349.0
1951-52	67.0	156	115.0	105.0	163.0	35.0	641.0
1952-53	44.0	65.0	112.0	40.0	93.0	57.0	411.0
1953-54	50.0	107.0	54.0	57.0	101.0	14.0	383.0
1954-55	37.0	53.0	134.0	129.0	60.0	59.0	472.0
1955-56	86.0	112.0	103.0	72.0	33.0	54.0	460.0
1956-57	36.0	50.0	86.0	41.0	97.0	76.0	386.0
1957-58	74.0	79.5	83.5	131.5	80.0	111.0	559.5
1958-59	38.0	47.5	81.0	107.0	84.5	28.0	386.0
1959-60	22.0	39.5	59.0	155.0	92.0	28.0	395.5
1960-61	75.0	40.0	1.0	62.0	113.0	35.0	326.0
1961-62	46.0	82.5	86.0	110.0	35.0	42.0	401.5
1962-63	31.0	17.0	85.0	39.0	93.0	136.0	401.0
1963-64	55.0	53.0	108.0	68.0	**183.0**	99.0	566.0
1964-65	95.0	141.0	150.0	66.0	44.0	77.0	573.0
1965-66	69.0	69.0	73.0	103.0	70.0	49.0	433.0
1966-67	53.0	84.0	168.0	72.0	61.0	106.0	544.0
1967-68	22.0	131.0	39.0	84.0	70.0	133.5	479.5
1968-69	87.5	132.6	113.0	148.0	35.0	50.0	566.1
1969-70	56.0	70.0	103.5	60.5	79.0	90.0	459.0
1970-71	79.0	142.0	58.0	73.5	87.0	42.0	481.5
1971-72	64.5	159.0	94.5	45.0	47.0	56.6	466.6
1972-73	----	122.0	64.5	77.0	124.0	109.0	496.5
1973-74	90.9	128.2	104.5	91.0	45.0	136.0	595.6
1974-75	25.5	146.5	104.0	88.0	151.0	90.0	605.0
1975-76	94.0	67.0	74.5	69.0	93.0	42.0	439.5
1976-77	13.5	17.0	50.5	73.5	129.0	31.0	314.5
1977-78	53.0	106.5	99.5	92.5	85.0	88.0	524.5
1978-79	62.5	96.0	78.5	86.0	71.0	94.0	588.0
1979-80	79.5	27.0	143.0	112.5	123.0	29.0	514.0
1980-81	40.0	34.0	73.0	82.0	110.0	52.0	391.0
1981-82	47.0	184.0	143.0	85.0	164.0	73.0	696.0
1982-83	66.0	165.0	75.5	68.0	150.0	112.5	637.0
1983-84	143.5	**244.5**	42.0	104.0	85.0	124.5	743.5
1984-85	112.5	105.0	44.0	61.5	99.5	34.5	457.0
1985-86	132.0	62.0	56.0	112.7	100.0	135.7	599.0
1986-87	73.0	12.3	96.0	73.0	104.0	23.5	381.8
1987-88	30.0	91.0	105.1	39.75	115.5	29.0	410.3
1988-89	172.5	124.5	70.75	97.5	64.75	52.0	581.5
1989-90	76.0	49.0	107.5	100.5	84.0	31.0	448.0
1990-91	109.5	91.0	82.8	49.7	110.9	**136.3**	580.2
1991-92	133.4	57.2	41.8	85	50.1	27.5	395.0
1992-93	118.8	119.2	165.3	102.9	63.0	81.2	650.4
1993-94	40.7	64.85	122.7	134.05	47.2	80.8	490.3
1994-95	**205.9**	73.8	**199.7**	56.3	128.9	80.7	**745.4**
1995-96	57	53	187	104	82	79	562
1996-97	78.3	164.8	141.5	91	53.8	69.7	599.1
1997-98	46.3	81.8	128.9	**156.6**	92.3	69	574.9
1998-99	76.5	43.1	105.3	98	46.5	89	458.4
1999-00	30.0	97.0	100.0	119.5	84.0	15.5	446.0
2000-01	88.0	71.0	66.2	79.5	53.0	112.0	469.7
2001-02	137	86.1	100.9	53.4	142.2	48.1	567.7
2002-03	42	78.7	26	84.1	93.8	74.8	399.4
2003-04	110	151	74.3	130	62	43.5	570.8
2004-05	62.7	86.4	113.5	77.9	153.6	59.5	553.6
Percent Average	151	164	79	155	69	65.95313	
Average	**73.1**	**92.1**	**94.1**	**83.8**	**89.6**	**66.0**	**499.1**
Maximum	**205.9**	**244.5**	**199.7**	**156.6**	**183**	**136.3**	**745.4**
Year of Max	**94**	**83**	**95**	**97**	**64**	**91**	**95**

"It was a dark and stormy day"… a typical winter's day during the atypical Wasatch winter of 2004-05.

Alta Guard Seasonal Snow Totals (Nov 1 through April 30)



Uinta Mountains Season Summary: by Craig Gordon

The western Uinta Mountains tend to get less snow, more wind, and generally have colder temperatures than the neighboring Wasatch. Historically, we see a weaker, shallow and usually more dangerous snowpack. This seems to be the general trend for the region, but we're only scratching the surface with a mere three years of actual snow and avalanche data.

October

This season though, was more like what the old timers called a "real winter". Even at lower elevation trailheads there was finally a deep snowpack. Like much of northern Utah, winter was off to a jump start in the middle of October and for two weeks it snowed nearly every day. The dense heavy snow plastered everything in sight, gluing itself onto steep slopes and rock bands that usually aren't covered until very late in the season. It was an unusual start to what would be an unusual season. The first, albeit minor, avalanche cycle occurred during the third week of October.

November

November started off disappointingly dry and it didn't take long for the faceting process to take place. While good skiing and riding on weak, recycled powder kept the conditions fun, we knew once it started snowing again these weak facets would come back to haunt us. After a quiet start, the month went out with a bang. The day after Thanksgiving, close to 2' of new snow with strong winds slammed into the range and a widespread, yet shallow avalanche cycle followed. The old facets were tender, but the load wasn't quite there yet.

December

Winter returned with a vengeance on Dec. 7th when a very warm and moist system made its way into the state, prompting me to issue the first **special avalanche advisory** for the region. High density snows fell and winds averaged in the 40's. The avalanche danger skyrocketed. Now we had the perfect recipe for avalanches… a cohesive slab, a weak layer and a bed surface. On the 8th I issued an **avalanche warning** for the area. While there was a widespread, pockety avalanche cycle, it seemed the snowpack needed a little more of a thump to make it react. Unfortunately, the intoxicating combination of clear skies and several feet of new snow, led to the first avalanche fatality in the Uinta Mountains on Dec.11, the second in the state in just two days. We also learned that two snowshoers were also killed in an avalanche in Big Cottonwood Canyon later that day.

The Uinta fatality wasn't that unusual in nature. Two very experienced snowmobilers were riding in the Trout Creek drainage, an area they had ridden for years. They got to the bottom of a steep slope and one of the riders started climbing while the other waited at the bottom. The first rider only got about a quarter of the way up the slope when he got stuck in the very deep snow on a slope measuring nearly 40 degrees in steepness. He got off his machine and started digging it out while his friend started climbing an adjacent slope to the west. The second riders plan was to get high enough on the slope to ride down on top of his partner and help dig him out. As rider number two approached a bench on the slope he was ascending, he could see the large slab fracture on the slope his stuck buddy was on. He circled back to the bottom of the slope to find the whole hill had avalanched and there was no sign of his friend. The buried rider did have a beacon and shovel; however the second rider had no rescue gear. With no surface clues in sight, rider #2 rode up to a ridge where he knew his cell phone would work and called 911. He also flagged down a group of three riders and they followed him back to site to assist in the rescue. This group though had no rescue gear and proceeded probing in likely burial spots with tree branches. Rider #2 then rode up to another adjacent ridge and flagged down two riders who had beacons, shov-

Trout Creek fatality site

els and probes and they returned to the avalanche site. Within roughly seven minutes they located the buried victim using their transceivers and began digging him out. He was buried about 4' deep, face up, and as they extricated him, local search and rescue personnel began arriving and assisted as well. The victim wasn't breathing and CPR was performed at the scene. A medical helicopter landed nearby and he was flown to a local hospital, but unfortunately died as a result of the avalanche.

The avalanche was a "pencil hard" slab averaging 4' in depth. The slide was well over a ¼ mile wide, running about 600 vertical feet. The weak layer was the facets formed during the November dry spell. It was a very large human triggered avalanche. There were at least eight natural avalanches that occurred within a mile of the accident. The avalanche danger was rated as ***CONSIDERABLE*** that day with "deadly consequences". In addition, in the morning's advisory there was a special mention to rising temperatures which could result in a natural avalanche cycle. Regrettably neither rider checked the avalanche advisory.

The middle of December was lackluster in terms of snowfall. Also, unusually warm temperatures helped the snowpack to strengthen and virtually ruined all the good powder. The day after Christmas a vigorous southerly flow over the region brought in strong winds, heavy snow and another avalanche cycle.

January

Ushering in the New Year was yet another **avalanche warning**. Four feet of snow had fallen in the matter of just a few days and wind drifts were up to eight feet deep! The region went through a large avalanche cycle, but fortunately it was a wallow-fest and the snow was too deep for anyone to get onto steep slopes. This was a big, tree snapping avalanche cycle, but paled in comparison to what we would see in the coming weeks. After a short breather, the reset button was punched and winter roared back to life. Hurricane force winds began raging on the 7th and another **avalanche warning** went into effect. In fact, several more **avalanche warnings** and **special avalanche statements** went out. These were issued even on days where a regularly scheduled advisory wasn't planned in order to relate the seriousness of the avalanche danger to the public, as a two week long southwest flow slammed into the range. Winds raged for thirteen out of fourteen days. Hourly averages were in the 30's and 40's with gusts in the 80's and 90's. In addition it snowed nearly a foot each day and densities were twice what we normally see here in Utah. Once again we had the right recipe for slab avalanches but this was different than the other avalanche cycles. Not many people were out during this historic event, but those that were getting on the snow returned with amazing tales of tremendous avalanches in places that hadn't run in 75-100 years! Crowns were anywhere from 5'-15' deep, but more remarkable were how wide and long running these slides were. Avalanches were occurring in unusual places, on lower angle slopes than anyone had seen slide before, and the timber damage was quite impressive. Surprisingly though, was the lack of human triggered avalanches and two factors may have contributed to this. First, the local media did a great job each night by airing the avalanche danger during the weather segment of the news. Snow and avalanches were a big story each evening. Secondly, the snow was just too deep to get anywhere. In the western Uintas, Utah State Parks grooms nearly 200 miles of trails. Early in the storm though, the State's snowcat broke down and with no groomed trails- only a handful of very experienced riders could get anywhere. The groomer did get up and running late in the storm when it seemed the natural avalanche cycle was starting to wane. However, on the afternoon of Jan.13th a natural slide in a very unusual place, dumped timber and debris on a freshly groomed swath, less than five minutes after the operator had passed by. He turned around for his second pass and was blown away by what he saw. These avalanches weren't just tree snappers- they ripped the trees out by the roots! Luck was on our side through this avalanche cycle and the month ended without incident.

Ray Santa Maria under a large crown.

February

February began quietly as high pressure took control and weak surface facets developed. The weather was fairly

benign until the second week brought in an unusual storm for the western Uintas- about 18" of snow and *no* wind. What a treat! Of course this was all about to change as the winds picked up on the 11th and slabs were forming at an alarming rate, leading to several human triggered avalanches. The weak facets formed during the beginning of the month were now buried. Towards the end of the month, at upper elevations, this turned out to be a tricky layer resulting in several surprises, a number of rides and close calls, but fortunately no injuries.

March

March started off dry, forming yet another round of surface facets, but winter returned on the third week of the month as a series of Pacific storms moved into the region. Like the rest of the winter, it seemed as though we would clear out for about a month or so then it would storm for close to two weeks at a time. March would be no different. In just ten days over six feet of snow would fall. With strong sunshine overhead and warming temperatures, instabilities settled out quickly and the month ended on a quiet note.

April

April brought a rapid decline in traffic, which was really too bad considering how much snow we had received and how filled in everything was. It's amazing to me that people will ride and ski on stumps and rocks in November, but come April when the coverage is the best it's been in years, the interest goes out the window. Our last advisory was issued on April 17th, followed by a year end information update.

Beacon Basin

This season brought yet another new partnership to the western Uinta avalanche program when Back Country Access (BCA) came on board and offered up the first ever, permanent avalanche beacon training facility exclusively for snowmobilers. We were overwhelmed by the generous offer, but had to first decide where to install it, so the facility would get the biggest bang for its buck.

A local rider tests her avalanche beacon skills at Beacon Basin.

The site had to be in a high traffic area, visible, and easy to access. Working with the Heber Ranger District, Craig decided to install "Beacon Basin" at the Nobletts trailhead which is located about 14 miles east of the town of Francis. The parking at this trailhead is free and on a sunny weekend with fresh snow, vehicles not only pack the parking lot, they also string for a mile or so down the shoulder of the highway. On a busy weekend day it's not unusual for there to be close to 200 rigs, equating to 400-600 sledders parking at this trailhead.

Bruce Edgerly and Jim Conway from BCA were key players. Bruce provided "Beacon Basin" and Jim put in countless hours fidgeting with the electronics and assisting in the installation. Several members from The USA supported the project by donating their time and back muscles to bury the locators.

From the first weekend, riders walked to the fenced in area and began practicing with their beacons. On busy days, 20-30 riders would visit the area either before or after their rides, and the facility was well received. In addition, it provided a great training site when Craig was teaching on snow avalanche awareness clinics. Beacon Basin was utilized by a wide variety of people including private groups, snowmobile clubs, and state and federal agencies.

Logan Mountains Season Summary: by Toby Weed

October

It was a good snow year in the Logan Area Mountains, and the season started early. Snow started flying in mid October, and we began issuing avalanche advisories a week before Halloween. Thankfully, temperatures were fairly warm during this period, and the early snow was pretty dense. A supportable base allowed droves of grinning and powder-struck winter sports enthusiasts to get an early start on winter in the regional backcountry.

November

By the first of November, over three feet of snow blanketed the higher elevations of the Bear River Mountains. The 8300' Snotel site at Tony Grove recorded 39 inches of total snow containing 7.4 inches of water. The first week of November brought warmer temperatures and some rain to the upper elevations. On the 8th, saturated soil conditions led to a significant rockfall-triggered wet avalanche on the west side of the popular Tony Grove Lake. A period of high pressure mid-month caused the development of an upper level weak layer consisting of well-developed surface hoar or frost and sugary near-surface facets. Once buried and preserved intact, these layers would become persistent weak layers responsible for numerous avalanches in the region. On Thanksgiving, snow began to fall again in earnest and strong westerly winds began to blow. The second storm of the holiday weekend hit on November 27th, and a backcountry skier triggered, but was not caught in, a wind slab avalanche above the town of Providence.

December

Location: Dry Canyon

On the first of December, the total snow sensor at Tony Grove Lake regained the three foot mark, reading 36 inches with 9.5 inches of water contained in the snowpack. The Friends of the UAC-Logan hosted a fundraising dinner party on December 4th. Over a hundred people attended the dinner and enjoyed fantastic Indian food, local musicians, good conversation and a plethora of raffle prizes donated by local businesses. Local volunteers worked hard to make the memorable event a huge success, bringing the backcountry community together and raising over three thousand dollars for the UAC-Logan. A mild and windy southwesterly weather flow fed by copious Southern Pacific moisture, which would become a familiar pattern this season, developed during early December. On December 8th, the Utah Avalanche Center issued an Avalanche Warning for the region and a HIGH avalanche danger existed in the Logan area backcountry, with widespread natural avalanching overnight. The danger remained HIGH on the 9th and we continued the Avalanche Warning. In a lucky near-miss, a snowmobiler triggered and was tumbled off his sled by a medium sized avalanche on the east face of Logan Peak. With fine weather in the forecast and a CONSIDERABLE danger in the backcountry, the stage was set for what would prove to be a deadly weekend in the Utah backcountry, with four avalanche fatalities. In the Logan Area on December 11th, snowmobilers triggered and barely escaped large hard slab avalanches in both the Logan Peak and Tony Grove Areas. In a very lucky case, two riders in a group of three triggered a large hard slab in the middle of an already heavily tracked bowl called Cornice Ridge. They managed to escape off the northern flank of the 500' wide and 6' deep avalanche into the middle of the bowl. The third rider, watching from below, somehow fired up his sled and rode to safety. The weather cleared in mid December under an extended high pressure system, and crusts and weak layers again formed near the snow surface. The Christmas holiday heralded another moist Pacific weather pattern, and an extended stormy period began in the region.

January

The Snotel site at Tony Grove recorded 72 inches of total snow containing 17.7 inches of water on the first of January 2005. The mountains of Northern Utah received significant snowfall on an almost nightly basis, with clas-

sic Utah super-light deep powder snow conditions. Southwesterly winds picked up for the weekend and became strong by January 8th, and snowfall became intense. Two more people triggered and died in avalanches in the Central Utah backcountry. In the Logan Area, explosive and extremely fast-moving natural powder avalanches blasted out of the funneling gullies below the eastern slopes of the Wellsville Mountains overnight, leveling many acres of big-tooth maple, mountain ash and aspen forest. Very high winds blasted the high country and heavy snowfall continued through Monday the 10th. In the 48 hours the Tony Grove site picked up 4.2 inches of water. Heavy snowfall and strong winds continued through the evening of the 11th, and Logan City was buried by inversion intensifying snow that would stay on the ground through most of March. Horrendous weather and obvious avalanche danger kept most people away from avalanche terrain--me included, and frustratingly, there was no way to verify my HIGH danger forecast. At some point late on January 11th, for only a short time period, the avalanche danger in the region actually became EXTREME in the Logan area backcountry. A very widespread and destructive natural hard-slab avalanche cycle occurred throughout the region. The monstrous slabs were releasing on the December and November weak layers and some stepped down to faceted snow near the ground. As clouds cleared on the morning of the 12th the extent of the devastation became apparent, impressing even the oldest backcountry travelers in the region with ½ mile-wide crowns towering over head-height and hundreds of full-grown trees turned to match-sticks in avalanche paths that have not run for years. The avalanche danger in the backcountry lingered at CONSIDERABLE for some time, and Utah's seventh avalanche death occurred near Park City on January 14th. In the Logan Area, we spent much of the rest of January, mostly under a high pressure system, cleaning out our pants while examining and photographing the widespread destruction across the region.

February

By the first of February, the total snow on the stake at Tony Grove had settled out to 76 inches containing 26.7 inches of water. After a solid month with little recorded avalanche activity, westerly winds picked up in the mountains, and February turned out to be a month with numerous close-calls in the Logan area backcountry. On February 11th a backcountry skier intentionally triggered a small hard-slab avalanche on Millville Peak, which ran farther then expected. During the next couple days, another closed low formed off the coast of Southern California and the now familiar windy Pacific moisture tap opened up, this time favoring the mountains around Logan. Strong westerly winds accompanied periods of heavy snowfall, and a little over 4 inches of water fell at the Tony Grove site between the evening of the 12th and the morning of the 15th. On Valentines Day, in separate incidents, backcountry skiers intentionally triggered (ski-cut) scary avalanches which turned out to be much bigger than expected. The first, around 500' wide and 4' deep at the crown, ran into a residential area overlooking Bear Lake, narrowly missing a house and deeply burying a driveway. The second, 1-3' deep and 150' wide, took a backcountry skier for a nasty ride and damaged some equipment. On February 16th, in separate incidents, snowmobilers triggered from below and were lucky to escape two large avalanches in the Franklin Basin area. An-

Dave Kickert seen here photographing a crown in Steep Hollow during the January avalanche

other moist and windy Pacific-fed storm moved into the region on the 19th and a natural slab avalanche cycle occurred throughout the region at all elevations sometime on February 20th. The most significant of these were repeaters, running on the same paths as those during the big January natural cycle. In a another very lucky turn of events on February 22nd, a snowmobiler triggered a broad avalanche from below and escaped on his machine while the avalanche funneled into a narrow neck and stopped within a hundred feet of his companions. The soft slab avalanche, about 2' deep and well over 1000' feet wide at the crown, failed on a graupel/facet layer. Snowmobilers and snowboarders, who are pushing the limits of their sports in the Tony Grove Area, intentionally triggered several smaller but significant slab avalanches during the last two weeks in February, apparently enjoying the challenge and adventure of playing with snow in motion.

March

On the first of March, the total snow depth sensor at Tone Grove recorded 90" and the scale measured 35.9 inches of water. This year in Northern Utah, March truly came in like a lamb and went out like a lion. The first half of the month brought little in the way of precipitation, and stagnant air, trapped by a dreaded and persistent temperature inversion afflicted the Cache Valley. Fair weather in the mountains once again caused the development of sugary weak layers near the surface. The weather changed March 13th, as strong westerly winds built stiff dirty wind crusts and thin solid slabs, capping the weak surface snow on some slopes and finally blasting the smoggy haze from the valley. An unsettled weather pattern took over, with cooler temperatures, clouds and small shots of snow. Snowfall became heavy the evening of March 19th, and snowfall totals by the 23rd had once again pushed the 4-inch mark at Tony Grove. A widespread natural avalanche cycle occurred the evening of February 23rd with most of the slides failing on week layers within the new snow, but a few stepping down into older sugary snow. We survived a fair Easter Weekend with a CONSIDERABLE avalanche danger in the backcountry without incident, but heavy snowfall with strong winds started up again the evening of March 28th and by the 30th over two more inches of water fell on upper elevation slopes throughout the region. On the last day of March (the 31st) skies cleared and once again there was a CONSIDERABLE avalanche danger in the backcountry. Our hope for an avalanche death-free month in the state was ended tragically in the neighboring Monte Cristo Mountains between Huntsville and Woodruff, when a snowmobiler triggered and was killed in a hard slab avalanche.

April

On the first of April, with 104" of settled snow containing 44.1 inches of water at Tony Grove, the Logan Area was assured an above average snow year and some relief from the recent drought. Solar warming and seasonal heating caused several impressive natural wet slab avalanches after pour overnight refreezes in both the first and second weeks of April. In the afternoon on April 14th, a snowmobiler triggered and rode out of a large wet-slab avalanche on the east face of Magog. The slide was around 250' wide and 1-2' deep at the crown.

It seems strange to be writing the season-ending report with around 7 feet of settled snow and 42.4 inches of water still at the Tony Grove Snotel site. It was a successful season for the UAC-Logan, and we are grateful for increasing public support and recognition of our efforts. More and more people—especially snowmobilers—are regularly checking our avalanche advisory. Again with the low-paid help of USU CNR graduate student, Dave Kikkert, the UAC-Logan produced well over 100 advisories this season, and with all the snow still in our mountains, we're not yet finished. We gave 7 free avalanche awareness talks and through the Friends of UAC-Logan and the USU ORC, 3 two-day Avalanche Basics classes, reaching well over 200 people. In a drawn-out self-taught learning process, I successfully redesigned and renovated our website. Although our season is quickly coming to a close, snow continues to fly in the region. Another moist and windy storm from the southwest is in the forecast, and although few people are out there to see them, avalanches continue to run in the Logan Area Mountains.

Avalanche Incidents and Accidents

Because of a very unstable snowpack the number of avalanche incidents, accidents and particularly fatalities was dramatically higher than the past several seasons. Eight people had lost their lives in avalanches in Utah during the 2004-05 season, which is four more than our average and two more than our previous record, set both in 96/97 and 00/01. And with the kind of wild year we had, we are lucky with only eight. Four other people had extremely close calls and there was only one fatality in the Dutch Draw incident, which could have easily involved a dozen people. Not only did Utah account for nearly a third of all the fatalities in the states, but at one point mid-winter, we accounted for more fatalities than all the other states combined. In looking at the near misses over the course of the winter, backcountry recreationists unintentionally triggered 158 avalanches, of which 69 people were caught, 19 were fully or partially buried, and 13 sustained moderate or severe injuries. The following is a synopsis of the major accidents for the winter.

12-10-04 Fatality above Twin Lakes Pass between Alta and Brighton

On December 10th, while traversing back to Twin Lakes Pass, Zachary Eastman, a 23 year old man triggered and was killed by a 1-3' deep hard slab avalanche. Interestingly enough, he did not fit the profile of a typical avalanche victim. Despite their youth, both he and his partner were quite experienced and avalanche-educated. This fatality reminds us that despite our experiences and knowledge, human factors can lead us to make fatal decisions.

That morning, the two young men met at Snowbird's new Rescue Training Center and did beacon practice. Afterwards, they hiked up to ride some familiar steep lines in the Wolverine/Tuscarora area of the Alta/Brighton backcountry. Strong southerly winds accompanied nearly 40" of snow in the few days preceding the accident, most of which fell on a very weak surface snow from the previous week's high pressure. The danger quickly rose to HIGH, and we issued an Avalanche Warning by the night of the 8th.

They were experienced and knowledgeable enough to find safe, steep lines even on a high danger day. They successfully descended a number of steep chutes in Wolverine Cirque, which had been scoured by the wind, which reduced the avalanche danger there. The accident occurred at the end of the day as they returned to their car. Hungry, thirsty, tired, and losing daylight, they traversed back to Twin Lakes Pass. They undercut a short but steep, wind loaded slope. The alternative was to drop a few hundred feet and ascend a lower-angled slope, which would have given them safe access to the pass, but this meant adding another few hundred feet of breaking trail in the snow after a long day.

With his partner waiting in a safe zone, Zach traversed out 150 feet. He stopped and told his partner that he didn't like the way the snow felt. He took another step or two and the slope ripped out 80' above him, carrying him down, and completely burying him in a grove of firs at mid slope. From his partner's viewpoint, it appeared that Zach had been carried down to the bottom of the slope, so he quickly descended to the debris at the bottom before beginning his search. When he failed to find a signal, he ascended to the grove of fir trees and quickly located Zach in an island of debris that piled up above the trees. Unfortunately, it was too late.

12-11-2004 Trout Creek – Uinta Mountains – Snowmobiler Killed

Just a day after the Twin Lakes incident, three other backcountry recreationists were killed, with one very lucky recovery in the mountains above Bountiful. In the Trout Creek drainage above the Strawberry Reservoir in the Uinta Mountains, a 42 year old man triggered and was killed in a massive avalanche as he struggled to free his stuck snowmobile high on a steep slope. It was a massive avalanche, 4-8 feet deep and a quarter mile wide, which failed on the weak, faceted snow near the base of the snowpack. Although the victim was wearing a beacon and shovel, his partner had no beacon. After failing to find any clues on the

surface, he had to search for other riders in the area who could help. It took about an hour for the others to arrive and they located the victim 5-7 minutes later. He was buried about 4' deep, face up, not breathing and CPR was initiated. His machine was buried as well and later located about 60' downhill.

12-11-2004 – Mineral Fork, Big Cottonwood Canyon, Two Snowshoers Killed

The same day as the above accident, two snowshoers, Bruce Quint, 59, and Melvin Dennis, 37, failed to return from a day of training for a mountaineering expedition that next spring. Their car was located at Mineral Fork a sub-drainage of Big Cottonwood Canyon near Salt Lake City and that night, volunteers from Wasatch Backcountry Rescue followed their tracks several miles up the bottom of Mineral Fork and the tracks ended in fresh avalanche debris in the bottom of the valley. Although there is no way to know if they triggered the avalanche, our investigation found that the snowpack was extremely fragile and we assume that they most likely triggered the avalanche from the bottom. The avalanche was a large, hard slab several feet deep and several hundred yards wide, but the dimensions were difficult to determine since rescuers used helicopter-delivered explosives the next morning to bring down extensive lingering avalanche hazard before they could safely begin their search.

Unfortunately, neither victim was wearing an avalanche beacon, further complicating the recovery. Rescuers, used avalanche dogs and probes, and found the two buried in the valley bottom, 25 yards apart underneath 4 and 8 feet of snow.

Rescuers in Mineral Fork

12-11-2004 - Close Call on Bountiful Peak – Snowmobiler completely buried

Maybe after four fatalities in two days, it was time for some good news. In the Bountiful Mountains, Trace DeJong, a 27 year old snowmobiler was parked at the base of a steep slope, making a video of his friend high marking above him. His friend triggered a very large avalanche, 8 feet deep and 200 feet wide. Dejong tried to start his snowmobile to get out of the way but the avalanche completely buried him after descending 800 vertical feet. Armed with an avalanche beacon but no shovel, his partner miraculously uncovered DeJong in under 15 minutes, not breathing but alive. A few minutes of rescue breathing brought his color back, and he was evacuated without major injuries.

1-1-05 Near Miss in the Snowbasin Backcountry

Late December snows brought as much as 2' of snow to the Ogden mountains accompanied by gusty southerly winds. On the 31st, four backcountry recreationists each unintentionally triggered a slab avalanche in the new snow about a foot deep, with one taking a 100' ride. The danger had been Considerable or High for the past couple days, with an Avalanche Warning continuing through the New Year. That day, a party of five rode a lift at Snowbasin to access Hell's Canyon, an out of bounds area just north of the ski area boundary. The party had skied the terrain numerous times over the years, however, the terrain is steep and complex with numerous starting zones over the 1000+ feet of relief. In the upper section, in an area known as 'Lust' (the seven major portions of Hell's Canyon named after the seven deadly sins), the party triggered a small slab that quickly expanded to 100' wide, catching and carrying three of the five over 1000' down to

the confluence of another runout area (Gluttony). Luck singularly landed the three beacon-less men on top of the debris, though one sustained a fractured femur. The two that were not caught made their way to the accident site and were helping their friends when another party from above triggered a second, larger avalanche down upon them. The initial party narrowly escaped a second disaster, as the second debris pile covered the first with over 6' of debris. Ski patrollers from the Snowbasin patrol responded to the accident and called in a medical helicopter, which airlifted the seriously injured man to the hospital.

1-8-05 Two Fatalities in Separate Avalanches on the Manti- Skyline/ Wasatch Plateau

The Manti Skyline area, a mountainous area south of the Wasatch, is well used by backcountry snowmobilers and snowmobile-supported skiers and riders from the communities south of Provo. Poor snowfall resulted in a weak basal snowpack through much of the early winter until the first week of the New Year. By the 8th, strong southwesterly winds accompanying a storm of nearly 20" overloaded the weak snowpack, easily justifying the Manti-LaSal Avalanche Center's Avalanche Warning for that area. That morning a party of four from Ephraim headed up to the Plateau for some backcountry riding. Well equipped with rescue gear and familiar with the terrain, they conducted some stability tests in the snow and assessed the snowpack to be stable. Running shuttles for each other, the party was nibbling at a known avalanche path called the Bluebell chute. Ultimately, the victim, a 26 year old man snowboarding above the other set of tracks, triggered and was caught and buried in a 2'x 300' wide avalanche. Buried under 3' of snow, the victim was recovered after 30 minutes.

Not an hour later, just 30 miles away, David Wayne Johnson, 42, of South Jordan triggered an avalanche in the Choke Cherry area east of Mt. Pleasant and was buried. The avalanche also caught and carried his companion, who was only partially buried. The slide was measured at three feet deep and nearly 1000' wide taking out the entire bowl. His companions located him, dug him out and he did not respond to CPR. It is unknown whether he was wearing a beacon.

1-14-05 Dutch Draw Fatality in the Canyons Backcountry

The Dutch Draw accident thrust Utah into the national and international news as initial reports claimed that as many as fifteen people were buried in a massive avalanche adjacent to the Canyons Ski Resort. Three

Bruce Tremper photo

days later, rescuers found one victim and the following day announced that they believed that the avalanche had claimed only one victim. The media circus quickly lost interest and left town. In the mean time, the UAC staff fielded countless live television interviews, telephone calls and press conferences to a hungry crowd of national and international media. The Summit County Sheriff had the unenviable job of sorting through several conflicting witness reports and account for any missing people out of the several thousand of tourists at the Canyons Resort that day.

Looking up from the bottom. Rescue team is visible in the center. Photo: Jake Hutchinson

The only thing that was known was that a group of five out-of-state snowboarders descended into Dutch Draw using small, treed, spur ridge and Shane Maxiner, 27, from northern Idaho, jumped a small cliff onto the slope and triggered a massive avalanche 6-8 feet deep and two football fields wide, and was then swallowed up in the avalanche. Another snowboarder in their group was descending below him at the time and was able to get out to the left side and escape. The rest of the group watched helplessly from the safety of the spur ridge. Three other parties in the area reported seeing many other people on the slope at the time, but in the end, those reports turned out to be wrong. Miraculously, the avalanche claimed only one victim.

Everyone assumed that a group of five young, out-of-state snowboarders without beacons represented the typical avalanche victim—young males with little avalanche education who did not consult the avalanche advisory before they went into the backcountry. But it turned out that nearly everyone in the group had quite a bit of avalanche training and experience and they were well aware of the avalanche danger. In fact, Shane Maxiner worked as a backcountry guide in northern Idaho and the group had spent the previous evening discussing the high avalanche danger. But they had just planned to stay in bounds that day, so even though most had beacons and shovels in their cars, they didn't wear them. They arrived at the top of the 9990 lift and saw, for the first time, the inviting powder of the adjacent backcountry and there seemed to be no lack of people enjoying it. The slope had several dozen tracks on it. So they decided that since so many other people were descending it without incident, they would give it a try.

Widespread, deep-slab instabilities existed at the time—conditions all too common to the Intermountain West. Since the huge storm the previous week had buried the weak layer under six feet of dense, hard snow, the avalanches were difficult to trigger, but if you did trigger one of these deep, monster slides, it would be almost impossible to survive. On the morning of the accident, our avalanche advisory read, "It's like playing with an armed nuclear bomb. You can probably keep it from

exploding but do you want to take the chance." Maxiner triggered the avalanche by jumping off a small cliff on to a mid-slope snowpack where the slab was thinner and the weak layer was unusually fragile

Not surprisingly, the incident rekindled the ongoing debate among the community, media, Forest Service, and the ski resorts over boundary policy of access of backcountry public land from lift-served terrain.

2-23-05 Near Miss on the Superior Slidepath, Little Cottonwood Canyon

In what has increasingly become known as 'Kodak courage', a lone skier being filmed skiing Mt. Superior triggered a small wind drift just off the ridge on a 42 degree, northeasterly facing slope. He was able to stay on his skis for a short while before the debris from a subsequently triggered slide 3 to 4' deep and 250' wide overwhelmed him, carrying him nearly two thousand feet down onto the Superior apron below. Lady luck smiled on the skier, as he landed on top of the debris, sustaining only minor injuries. His ten minutes of fame came soon, as the survivor and his footage were interviewed and shown on national television.

An extremely lucky skier sustained only minor injuries after triggering an avalanche on this very exposed slope of Mount Superior in Little Cottonwood Canyon. Photo: Daniel Howlett

3-24-05 Near Miss off the Dot-Com Ridge, an Out of Bounds area adjacent to Snowbasin

With recent storm totals in the 1.5-3' range, the danger was rated as HIGH in the Ogden mountains as Tate Henderson and two friends ventured outside of the ski area boundary at the Snowbasin ski area. While the avalanches had been knocked down within the perimeter by the ski area, the backcountry was a different story altogether. Numerous avalanches had run both within the new snow as well a stepping down to a

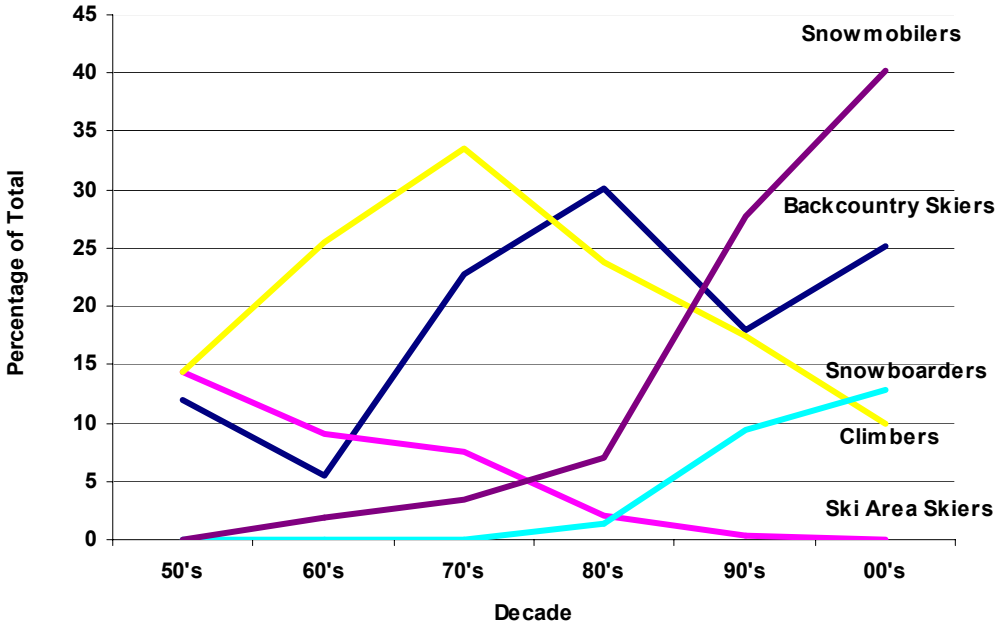
buried ice layer, causing large and dangerous slides. The three, not wearing any rescue gear, headed south that day beyond the Strawberry boundary in search of untracked snow, when the first skier triggered a 1.5' deep and 150' wide slide that caught and carried two of the three. When the debris stopped 150' later, Henderson was buried with only a hand sticking out, while his friend was buried up to his knees. The others in his party quickly skied down to the hand and recovered him within minutes.

3-31-05 Fatality near Whiskey Hill, Eccles Peak, east of Huntsville

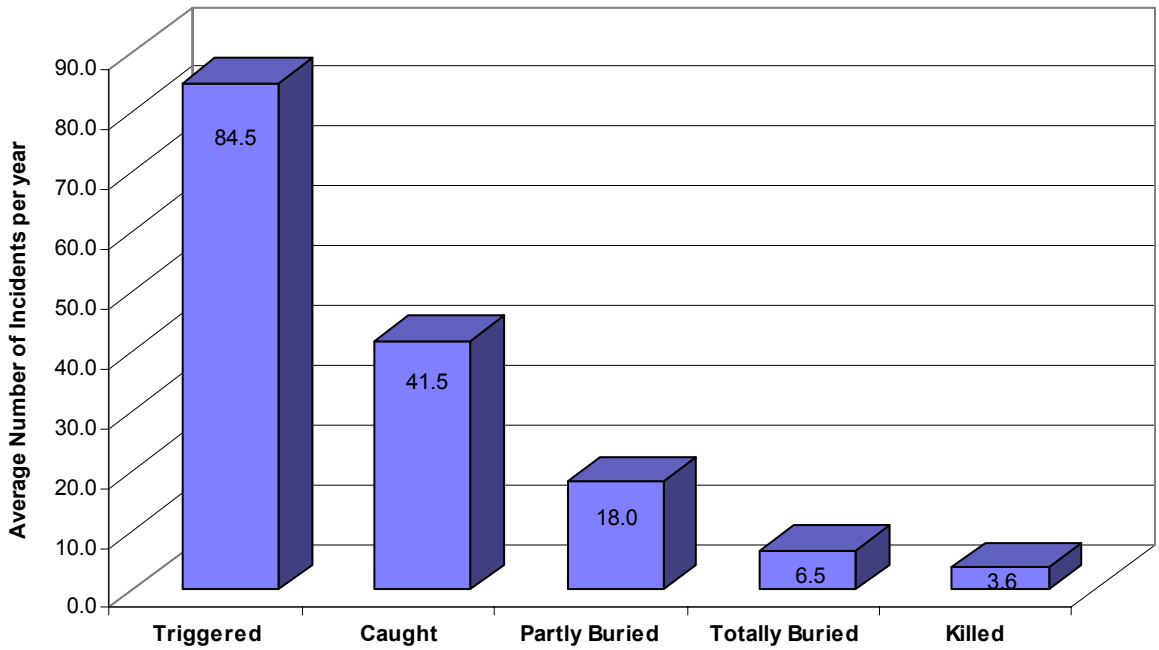
On the 31st, a group of five snowmobilers left the Monte Cristo trailhead outside of Huntsville in the Ogden mountains, heading for terrain they knew well. The range had recently experienced a significant storm cycle the previous two days. Thirty or so inches of snow had fallen, accompanied by moderate to strong northwest and westerly winds, setting up what was to be another avalanche cycle. The party rode to the top of a slope, south of "Whisky Hill". To everyone's surprise, one of the riders, a 27 year old man, continued over the edge and down onto the slope, triggering a 4 foot deep and 600' wide hard slab avalanche, pulling out onto overloaded weak layers formed during our dry spell in early March. Despite a quick recovery with avalanche beacons and shovels, the rescuers were unable to revive him, resulting in Utahs 8th fatality.

FSUAC forecaster Craig Gordon, hikes up the bed surface to inspect the crown of this deadly avalanche.

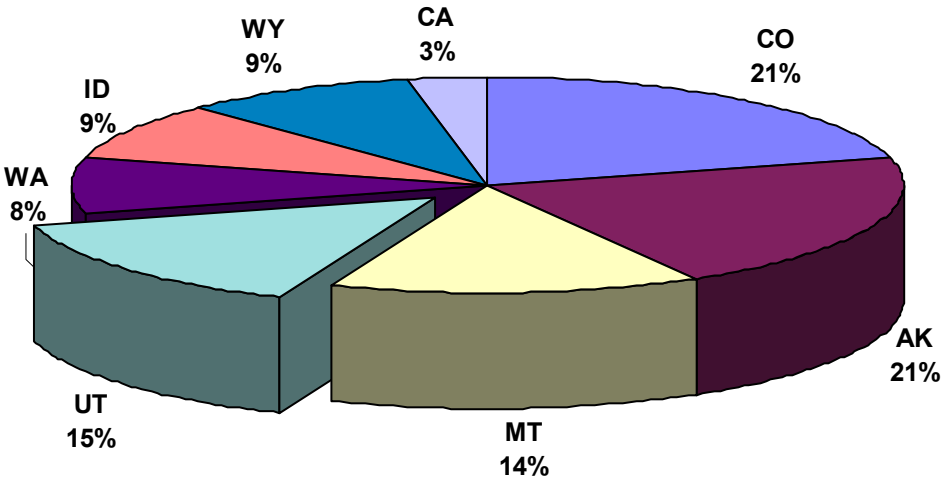
U.S. Avalanche Fatalities by Decade



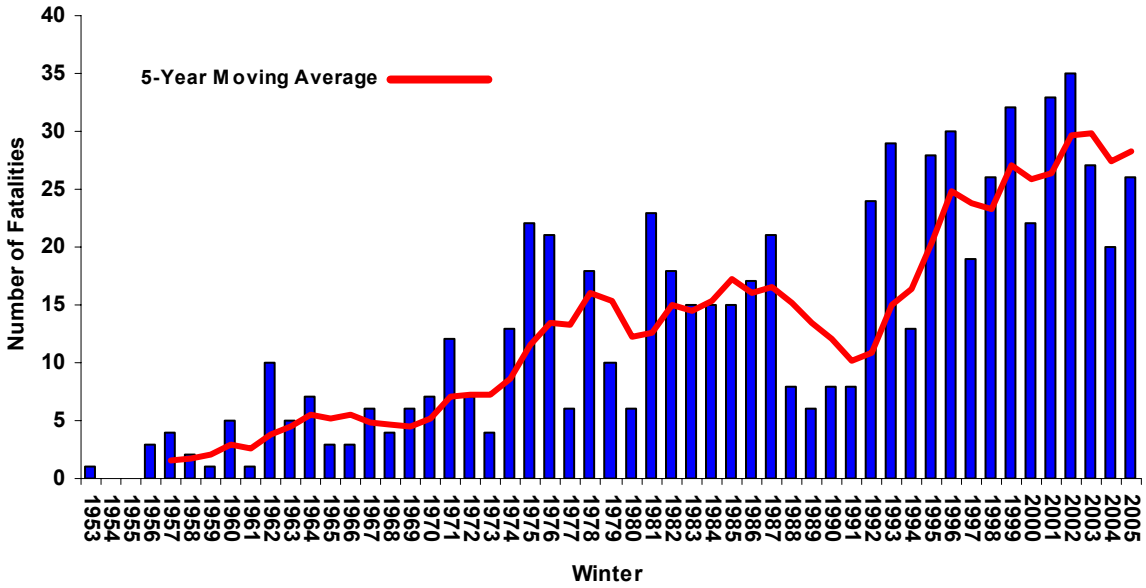
Avalanche Incidents in Utah 1996-2005



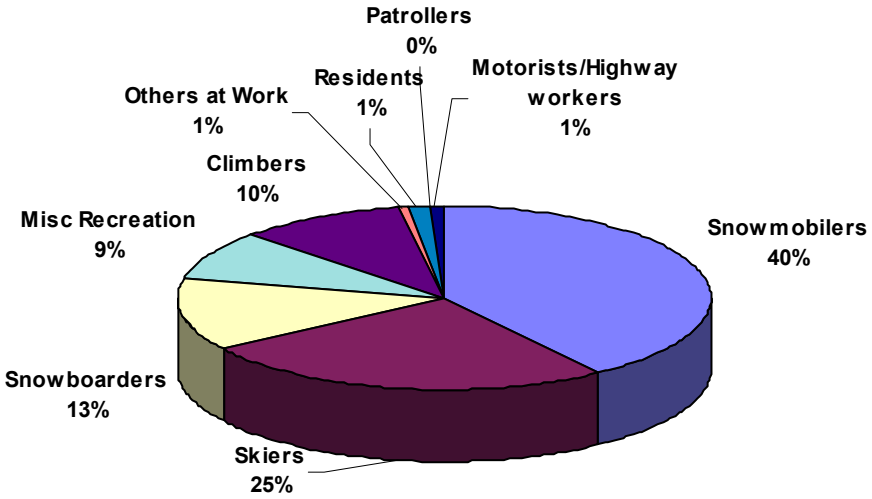
U.S. Avalanche Fatalities by State 1995-2005 (N = 278)



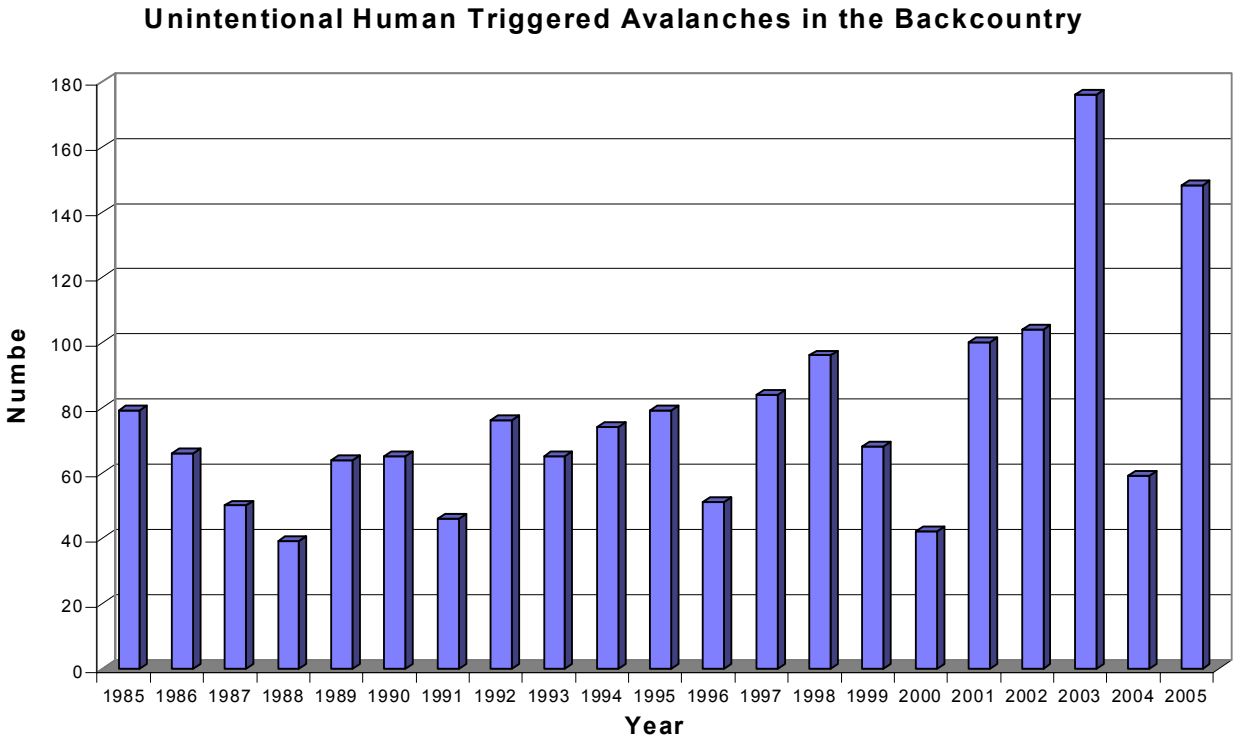
U.S. Avalanche Fatalities 1950-2005



U.S. Avalanche Fatalities by Activity
Past 5 Seasons - Ending 2005
139 Total Fatalities



Avalanche fatalities didn't discriminate in Utah where two snowboarders, two snowshoers and one skier were killed. Unfortunately, despite very aggressive avalanche education outreach programs, snowmobilers led the list



While we've seen past years with more avalanches triggered, none was as deadly as the 2004-05 season.

Incidents and Accidents 2004-05

(list includes unintentional human triggered avalanches in the backcountry)

Date	Region	Location	Trigger	Comments	Triggered	Caught	Partly Buried	Totally Buried	Killed	Injured
10/24/2004	SLC	Alta Area	Skier ?	Probable skier triggered avalanche in middle of day. Debris ran to Ballroom. Debris searched but no one found. Alta not yet open and not doing avalanche control.	1					
10/25/2004	SLC	All areas	Skier and Naturals	Several sensitive, skier-triggered and natural wind slabs in light density new snow. PHOTOS	3					
10/25/2004	SLC	Little and Big Cottonwood	Skier	Several skier triggered avalanches, one 2' deep and 400' wide.	2					
10/28/2004	SLC	Little and Big Cottonwood	Skier and Naturals	Several sensitive, skier-triggered and natural wind slabs in light density new snow. Some naturalling reported.	3					
11/13/2004	SLC	Red Baldy	Skier	Skier caught and carried, lost gear. Fracture broke 50' above traverse.	1	1				
11/26/2004	SLC	Holy Toledo	Skier	Caught and carried 50' - OK. Broke out wall to wall.	1	1				
11/26/2004	SLC	High Ivory	skier	Caught and carried 100' - OK	1	1				
11/27/2004	SLC	Upper Snake Creek/ Brighton BC	Human - remote		1					
11/27/2004	SLC	Upper Snake Creek/ Brighton BC	Human - remote		1					
11/27/2004	Provo	with in the unopened Sundance ski area	skier - remote	Remotely triggered from 50' away.	1					
11/28/2004	SLC	Superior - Little Superior Buttress	Skier	Skier triggered but not caught	1					
11/28/2004	SLC	George's Bowl - Cardiff Fork	Skier	Skier triggered remotely	1					
11/28/2004	SLC	Reynolds Peak - BCC	Skier - remote	Remotely triggered from 200 yards away on ridge.	1					
11/28/2004	SLC	Pink Pine - LCC	Skier	Skier triggered and caught but grabbed a tree after going only 4 feet.	1	1				
11/28/2004	SLC	Meadow Chutes - Silver Fork	Skier	Remotely triggered from 100 feet away.	1					
11/28/2004	SLC	Meadow Chutes - Silver Fork	Skier	Remotely triggered.	1					
11/28/2004	SLC	Emma Ridges near Alta	?		1					
11/28/2004	SLC	Flagstaff near Alta	?	Released several slides - more sensitive than they have seen in some time.	3					
11/29/2004	PC	Summit Park	skier-remote	remotely triggered from 30' away	1					
11/30/2004	SLC	Meadow Chutes - Silver Fork	skier	Skier probably caught and carried.	1	1				
12/1/2004	Provo	Giant Staircase-Timp	skier		1					
12/1/2004	SLC	Maybird - Red Pine ridge	Skier	Skier triggered but not caught	1					
12/2/2004	SLC	near Scotties Bowl	skier	Skier took short ride.	1	1				
12/3/2004	SLC	above Red Pine Lake	skier	two skiers caught and carried for 20'	1	2				
12/3/2004	SLC	near Twin Lakes Pass	skier		1					
12/4/2004	SLC	Columbine, upper White Pine	skier-remote	remotely triggered from 30' away	1					
12/5/2004	SLC	Tri-County Peak	skier - remote	Remotely triggered by skier	1					
12/7/2004	SLC	Near Alta - Patsy Marly area	Skier	See the PHOTO of a skier triggered avalanche near Alta.	1					
12/8/2004	all	all	Skier	Numerous remotely triggered slides	8					
12/9/2004	SLC	Willows - BCC	Natural	Remotely triggered on 12/8/04	1					
12/10/2004	SLC	Twin Lakes Pass	Skier	Skier triggered, buried and killed. See Incidents and Accident and Photos links	1	1		1	1	
12/11/2004	SLC	South Monitor	skier-remote	Reportedly ran to the ground.	1					
12/11/2004	SLC	West Monitor	skier-remote	Remotely triggered from W.Monitor/McDonald Draw subridge and triggering avalanches in both McDonald and W.Monitor.	2					
12/11/2004	SLC	Alexander Basin	skier-remote	Remotely triggered 100' from skin track, taking out their ski tracks. Avalanche came down from above, missing the party by 10'.	1					
12/11/2004	SLC	Mineral Fork	Unknown	Two snowshoers killed - See Photos and Incidents and Accidents pages	1	2		2	2	

Incidents and Accidents 2004-05

(list includes unintentional human triggered avalanches in the backcountry)

Date	Region	Location	Trigger	Comments	Triggered	Caught	Partly Buried	Totally Buried	Killed	Injured
12/13/2004	SLC	Pink Pine - LCC	Skier	Skier was not caught after triggering slide 1/2 way down the slope. Very steep, uppermost bowl in Pink Pine.	1					
12/29/2004	SLC	Rocky Point	skier-remote	Both sides slid, chute plus lower angle slope. Triggered remotely as skier approached summit. Shallow, new snow slide.	1					
12/31/2004	Ogden	Coldwater/Hells Canyon	Skier	3 slides triggered, one person took a 100' ride, grabbed tree, OK	3	1				
1/1/2005	Provo	Chablis Bowl near Sundance	Skier	Skier-triggered, self-arrested on bed surface.	1	1				
1/1/2005	SLC	Meadow Chutes - Silver Fork	skier-remote	remotely triggered 50' away, taking out old tracks. Ran on December factes and was a wind loaded pocket	1					
1/1/2005	Provo	Sundance backcountry	skier	skier had to self arrest	1					
1/1/2005	Ogden	Coldwater/Hells Canyon	skier	Debris nearly reburied 3 previously caught.	1					
1/1/2005	Ogden	Coldwater/Hells Canyon	Skier	3 skiers caught and carried 1800', partially buried, one seriously injured.	1	3				1
1/2/2005	SLC	Alexander Basin - Toots to Boot	Skier	Triggered by skier - escaped to side.	1					
1/2/2005	PC	Limelight Bowl near Park City	Skier	Remotely triggered by skier	1					
1/2/2005	SLC	Millicent Peak near Brighton	Snow boarder	Snowboarder triggered, caught, carried over cliffs, injured knee and evacuated by Brighton patrol	1	1				1
1/3/2005	PC	Daily Canyon	skier-remote	Probably remotely triggered by people on ridge. Ran 100 yards.	1					
1/5/2005	SLC	Main Days	skier	Skier-triggered avalanche - rode all the way to the bottom but ended up on the surface.	1	1				
1/6/2005	SLC	Kessler Peak	Skier	Second hand report of skier triggering a loose snow sluff on the north facing Kessler, possibly going for a ride.	1	1				
1/6/2005	SLC	Flagstaff near Alta	Skier	Skier was caught in two different large sluffs but not injured	2	2				
1/7/2005	SLC	Beartrap - BCC		Second hand report of a skier triggering an avalanche - no details	1					
1/7/2005	SLC	Brighton backcountry - Elevator Chute	Skier	Skier jumped rock, broke his femur and triggered a small avalanche, uncertain if the avalanche caused the fall or was triggered by the skier's fall off the rock. Either way, the avalanche seemed to play a minor role.						1
1/8/2005	Manti/ Skyline	Ephraim	Snow boarder	Caught, carried, burried and killed	1	1		1	1	
1/8/2005	Manti/ Skyline	Choke Cherry	Snow-mobiler	Caught, carried, burried and killed	1	1		1	1	
1/9/2005	SLC	Hidden Canyon/Guardsman	skier-remote	Remotely triggered along the ridgeline	1					
1/14/2005	PC	Dutch Draw	Human	Snowboarder fatality (photos)	1	1		1	1	
1/14/2005	SLC	Alexander Basin	Cornice drop	triggered by skier kicking off cornice.	1					
1/14/2005	SLC	Tuscarora	Cornice drop	triggered by skier kicking off cornice.	1					
1/16/2005	PC	Murdock Peak	Skier	skier triggered	1					
1/24/2005	SLC	Gobblers Knob	skier remote	Remotely triggered 150' below skier, then sympathetically triggered 2 additional slides. Broke on wet facets near ground.	3					
2/5/2005	Provo	Primrose Cirque	snow shoer	Snowshoer caught, got out to side OK. Recent wind drift, running on an old bed surface.	1	1				
2/9/2005	SLC	Alexander Basin	Snow boarder	Boarder cut above his partner and triggered a sluff, which took lower boarder down through small trees and small cliffs. Broken split board but otherwise OK.	1	1				
2/11/2005	Uinta	Bald Mountain	skier	broke 100' above skier, was carried and stopped	1	1				
2/13/2005	SLC	Kessler Peak	Skier	Repeater, ran on facets over bed surface	1					
2/13/2005	SLC	Sunset Peak	Skier		1					
2/15/2005	SLC	Butler Fork	Skier-remote	Remotely triggered.	1					
2/15/2005	SLC	Silver Fork	skier-remote	Remotely triggered from 75' away.	1					
2/15/2005	SLC	Alexander Basin	Skier	Skier caught, carried, got out to side.	1	1				
2/16/2005	SLC	Gobblers Knob	Skier	Slide released behind skier as they ski cut off of slope. Skier was not caught.	1					
1/1/2005	SLC	Meadow Chutes - Silver Fork	skier-remote	remotely triggered 50' away, taking out old tracks. Ran on December factes and was a wind loaded pocket	1.146376					
1/1/2005	Provo	Sundance backcountry	skier	skier had to self arrest	1.149161					
1/1/2005	Ogden	Coldwater/Hells Canyon	skier	Debris nearly reburied 3 previously caught.	1.151946					
2/18/2005	SLC	Argenta	Skier-remote	remotely triggered from ridgeline	1					

Incidents and Accidents 2004-05

(list includes unintentional human triggered avalanches in the backcountry)

Date	Region	Location	Trigger	Comments	Triggered	Caught	Partly Buried	Totally Buried	Killed	Injured
2/19/2005	Provo	Mt. Nebo	Hiker	Media report of a hiker that "rode 1000 feet in an avalanche feet first" bruised back and frostbit feet but otherwise OK	1	1				1
2/19/2005	SLC	Snake Creek	Skier-remote	Three slides triggered, this was largest, triggered remotely on uptrack.	3					
2/19/2005	Ogden	Cutler Ridge	Skier		1					
2/19/2005	SLC	Rocky Point	Skier		1					
2/19/2005	SLC	Little Superior	Skier-remote	remotely triggered 50' away	1					
2/19/2005	SLC	East Bowl Silver Fork	Skier on uptrack	pulled out 10' above skier, went for a short ride	1	1				
2/20/2005	SLC	Brighton backcountry - Dog Lake Chute	Skier	Unintentional skier triggered, not caught.	1					
2/21/2005	Ogden	Backcountry/ Snowbasin	Snow-board	Snowboarder caught, taken for ride, partially buried, uninjured, self extricated.	1	1	1			
2/21/2005	Ogden	Backcountry/Pow der Mtn	Skier	Triggered remotely from a snowboarder.	1					
2/21/2005	SLC	Toledo Chute	Snow-board	Slide fractured above person but he was able to get out of the way.	1					
2/21/2005	SLC	Flagstaff Ridge	Skier	Skier remotely triggered on up track near top	1					
2/22/2005	Ogden	Backcountry/ Snowbasin	Skier	Skier skied out	1					
2/23/2005	SLC	Pioneer Ridge	Snow-boarder	The snowboarder broke through the cornice, triggering slide, went for ride, injured.	1	1				1
2/23/2005	SLC	Superior	skier	1st soft slab caught skier, then released 2nd deeper slide, probably into old snow. Injured.	2	1				1
2/24/2005	SLC	No Name Bowl	Skier	Released remotely from skier walking ridge	1					
2/24/2005	Uintas	Windy Ridge	Skier	Skier went for a ride, submerged, partially buried, uninjured	1	1	1			
2/24/2005	SLC	Wolverine	Skier		1					
2/24/2005	SLC	Mineral Fk.	Skier	Skier caught, rode 500' vertical, submerged a few times, uninjured	1	1				
2/24/2005	Ogden	Snowbasin/ Backcountry	Skier	Skier triggered initial slide which sympathetically released other small pockets	3					
2/26/2005	SLC	Scotty's Bowl	Skier	Unintentional skier triggered, not caught.	1					
3/6/2005	SLC	Emma Ridges near Alta	Skier		1					
3/6/2005	SLC	Toledo Chute	Skier	Skier took 300' ride, ok.	1	1				
3/7/2005	SLC	Lone Peak	Skier	2 skiers took short ride, heating weakened a wind slab.	1	2				
3/9/2005	SLC	South Thunder Peak	Skier	caught, skied off	1	1				
3/9/2005	SLC	Crows Foot	Skier	"push-a-lanche", carried short distance and grabbed tree, debris pile 5' deep	1	1				
3/20/2005	Ogden	Tayler Canyon	Skier	Skier was caught but able to grab a tree and stop before taking a nasty ride.	1	1				
3/24/2005	Ogden	South of Snowbasin	Skier	Out-of-bounds skier buried with only hand sticking out-no beacon recovered by friends-no injuries	1	1	1			
3/24/2005	SLC	Cardiff Bowl	Skier	One triggered and another sympathetic-not caught	2					
3/25/2005	SLC	Mt. Olympus		3 snowshoers caught, partially buried, OK	1	3	3			
3/25/2005	SLC	Kessler Peak	Skiers	3 skiers caught, strained through trees, all serious injuries	1	3	3			
3/25/2005	SLC	Georges Bowl	Skier	Skier triggered, no one caught.	1					
3/25/2005	SLC	Kessler-Argenta	Skier	3 Skiers caught, sustained injuries, no one buried, rescue needed to extricate.	1	3				3
3/25/2005	SLC	Near Mt Olympus	Snow shoe	3 snowshoers caught, partially buried, self extricated, no one injured.	1	3				
3/25/2005	SLC	Days Fork	Skier/ boarder	Skier or boarder triggered soft slab but was able to esape to right. This was after dropping a refrigerator-sized cornice down slope first.	1	1				
3/26/2005	PC	Limelight Bowl near Park City	Skier	Reported possible skier triggered	1					
3/26/2005	Ogden	Needles Cirque	Skier	No one caught	1					
3/26/2005	SLC	Snake Creek	Skier	No one caught	1					
3/27/2005	SLC	Cardiff Bowl N. of Alta	Skiers	Triggered by booting up from bottom. 4 people caught, one buried to waist, all OK	1	4	1			
3/29/2005	SLC	Powder Park. Mill D north	skier	Caught, stopped	1	1				
3/29/2005	SLC	Pioneer Ridge	rider	Unintentionally triggered, not caught	1					
3/30/2005	SLC	Mill D N./ Short Swing	Skier	Skier triggered slide on steep roll, far skiers right on Short Swing, no one caught.	1					
3/31/2005	Rich Co.	Near Whiskey Peak	Snow Machine	One person caught, buried and killed.	1	1		1	1	
3/31/2005	SLC	Brighton Back Bowl	skier/ boarder	Ran on interface between Monday's and Tuesday's storms. Three other smaller slides triggered by same party.	4					
4/8/2005	SLC	East Hellgate LCC	Skier	Skier rode wet slide 350'	1	1				
4/10/2005	SLC	Thunder Ridge	Skier	Skier fell with cornice 1500' into Hogum Fork, sustaining serious injuries	1	1				1
				Totals	148.4475	65	10	9	8	11

Avalanche Fatalities in Utah 1958-2004 - By Activity

Date	Male Deaths	Female Deaths	Location	Activity	Skier	Climber	Snow boarder	Snow mobiler	Other Recreation	Worker	Resident
9-Mar-58	2		Snowbasin	Rescuer						2	
29-Mar-64	1		Snowbasin	Worker						1	
31-Dec-65	1		Park City	In-bounds skier	1						
12-Feb-67	2		Pharoah's Glen	Climbers		2					
19-Feb-68	1		Rock Canyon	Hiker					1		
29-Jan-70	1		Alta	In-bounds skier	1						
29-Jan-73	1		Park West	In-bounds skier	1						
6-Jan-76	1		Alta	Out of bounds skier	1						
3-Mar-77	1		Snowbird	In-bounds skier	1						
19-Jan-79	1		Helper	Worker						1	
2-Apr-79	1		Lake Desolation	Backcountry skier	1						
11-Jan-80	1		Evergreen Ridge	Out of bounds skier	1						
1-Feb-81	1		Cardiff	Hiker					1		
1-Mar-81	1		Millcreek	Backcountry skier	1						
22-Mar-82	1		near Park West	Backcountry skier	1						
2-Jan-84	1		Superior Peak	Backcountry skier	1						
22-Feb-85	1		Near Powder Mountain	Backcountry skier	1						
19-Mar-85		1	Park City	In-bounds wet slide	1						
13-Nov-85	2		Sunset Peak	Backcountry skiers	2						
6-Jan-86	1		Provo Canyon	Backcountry skier	1						
17-Feb-86	1		Big Cottonwood Canyon	Backcountry snowboarder			1				
19-Feb-86	1		Alta	In bounds skier	1						
20-Nov-86	1		Sugarloaf, Alta	Hiker in unopened area					1		
15-Feb-87	1		Twin Lakes Reservoir	Backcountry skier	1						
25-Nov-89	1		Tony Grove Lake, Logan	Backcountry skier	1						
12-Feb-92	3	1	Gold Basin, La Sal Mtns	Backcountry vskiers	4						
1-Apr-92	1		Mineral Basin, near Snowbird	Backcountry skier	1						
16-Jan-93	1		Sundance (closed area)	Backcountry skier	1						
25-Feb-93	1		Pinecrest, Emig. Cyn.	Backcountry skier	1						
3-Apr-93	1		Wolverine Cirque	Backcountry skier	1						
18-Feb-94	1		10,420 Peak, B.C.C.	Backcountry skier	1						
7-Nov-94	1		Snowbird (pre-season)	Backcountry skier	1						
14-Jan-95	2		Ben Lomond, near Ogden	Snowmobilers				2			
23-Jan-95	1		Midway	Resident killed in roof slide							1
12-Feb-95	1		Gobbler's Knob, B.C.C.	Backcountry skier	1						
2-Feb-96	1		Solitude patroller	Worker						1	
27-Mar-96	1		Maybird Gulch, L.C.C.	Backcountry skier	1						
7-Dec-96	1		Bountiful Peak	Snowmobiler				1			
26-Dec-96	1		Flagstaff Peak	Backcountry snowboarder			1				
11-Jan-97	3		Logan Peak	Three campers					3		
25-Jan-97	1		Provo Canyon	Climber		1					
17-Jan-98	1		Near Coleville	Snowmobiler				1			
18-Jan-98	1		Sanpete County	Snowmobiler				1			
26-Feb-98	1		Near Weber State	hiker (possible suicide)					1		
7-Nov-98	1		Snowbird (pre-season)	Snowboarder			1				
2-Jan-99	2		Wasatch Plateau	Snowboarders			2				
29-Jan-99	1		Mt. Nebo	Snowmobiler				1			
6-Feb-99	1		Little Willow Canyon	Hiker					1		
11-Jan-00	1	1	Squaretop	Out of bounds Skiers	2						
14-Dec-01	1		Willard Basin	Snowmobiler				1			
27-Feb-01		1	Near Canyons Resort	Out of bounds Skier	1						
10-Mar-01	2		Uinta Mtns near Oakly	Snowmobiler				2			
28-Apr-01	2		Stairs Gulch, BCC	Climbers		2					
31-Jan-02	1		Windy Ridge, Uinta Mtns.	Backcountry Skier	1						
16-Mar-02	2		Pioneer Ridge near Brighton	Out of bounds Snowboarders			2				
15-Feb-03	1		Gobbler's Knob, B.C.C.	Skier	1						
26-Dec-04	3		Aspen Grove, Timpanogos	Snowboarders			3				
26-Feb-04	1		Empire Canyon - Park City	Snowshoer					1		
10-Dec-04	1		Twin Lakes Pass	Skier	1						
11-Dec-04	1		Trout Creek, Uintas	Snowmobiler				1			
11-Dec-04	2		Mineral Fork	Snowshoer					2		
8-Jan-05	1		Ephriam Canyon, Wstch Plt	Snowboarder			1				
8-Jan-05	1		Choke Cherry, Wasatch Plt	Snowmobiler				1			
14-Jan-05	1		Dutch's Draw	Snowborder			1				
31-Mar-05	1		Eccles Peak, Monte Cristo Rg	Snowmobiler				1			
	Male	**Female**	**Male & Female**	**1958 season - Present**	**36**	**5**	**12**	**12**	**11**	**5**	**1**
Totals	**78**	**4**	**82**	**Past 10 seasons**	**7**	**3**	**11**	**10**	**8**	**1**	**0**
Percentage	**95.1%**	**4.9%**	**100%**	**Past 5 seasons**	**4**	**2**	**7**	**6**	**3**	**0**	**0**

Avalanche Education

We feel that avalanche education is an essential part of staying alive in avalanche terrain. It not only gives people the basics of avalanche knowledge, but it helps create and maintain an avalanche culture, where people learn from their peers. We teach many free avalanche awareness classes throughout the season, partially to give people the basics of how to stay alive, but also to inspire them to take a more detailed, multi-day avalanche class from the private sector. This season our staff taught 38 avalanche classes and directly reached over 3,400 people. The Know Before You Go Program was taught 81 times to an additional 12,000 people.

We also had a very successful Avalanche Awareness Week in February, which started with a signing ceremony by Jon Huntsman Jr. Utah's Governor. Governor Huntsman was also one of the featured speakers for a fundraiser supporting the Know Before You Go Program at Snowbird put on by the Friends of the Utah Avalanche Center. Avalanche awareness week consisted of a media blitz and several classes offered both indoor and in the field. Many thanks to Roger Kehr and Colleen Graham for organizing the event and to a great partner, Snowbird Ski Resort, for hosting the event.

Governor Jon Huntsman, Jr. signing a declaration for February's Avalanche Awareness Week

UAC Avalanche Education 2004-05			
Date	**Staff**	**Event**	**No. people**
10/12/2004	Tremper	Forest Service Leadership Team - Avalanche Awareness	10
11/1/2004	Hardesty	Kamas Community Development	40
11/4/2004	Tremper	Utah County Sheriff - Avalanche Awareness	30
11/17/2004	Tremper	Ski With a Ranger training	20
11/20/2004	Tremper	Canada, Calgary, Alberta - Avalanche Continuing Education	250
11/20/2004	Tremper	Canada, Vancouver B.C. - Avalanche Continuing Education	250
12/2/2004	Tremper	Hansen Mountaineering - Avi Awareness	30
12/2/2004	Lees	Sandy REI	20
2/2/2005	Tremper	Park City Rotary Club - Avalanche Awareness	60
12/14/2005	Tremper	REI Avalanche Awareness talk	120
12/14/2004	Lees	Parson's, Behle and Letterman Law Firm	45
1/10/2005	Tremper	ARUP Labs - Avalanche Awareness	200
1/15/2005	Tremper	Park City - Avalanche Awareness and Dutch Draw Accident	200
1/15-17/05	Tremper/Kobernik/Athey	Friends of the UAC Level I	32
1/26/2005	Tremper	Pannel Discussion - SL Library and live on public radio	150
1/28/2005	Tremper	Outdoor Retailer Show - Avalanche Awareness talk	40
2/2/2005	Lees	ACE beacon clinic	25
2/6/2005	Lees	Backcountry Awareness Week clinics	12
2/15/2005	Tremper	REI Science of Avalanches	120
2/19-21/05	Lees/Hardesty/Kobernik/Athey	Friends of the UAC Level I	25
2/26/2005	Lees	AAI Level II	32
			1711

There were no shortage of large crown faces like this one during the 04-05 season.
Photo: Bob Athey

Know Before You Go Program			
Date	**Staff**	**Event**	**# People**
9-Nov	Gordon	REI-33rd South Store	52
10-Nov	Gordon	University of Utah	48
13-Nov	Gordon	REI-Sandy Store	43
15-Nov	Gordon	Rowland Hall St. Marks	252
16-Nov	Gordon	BYU Student Union Bldg.	78
17-Nov	Kimbrough	Skyline High School	120
18-Nov	Gordon	Realms of Inquiry	39
29-Nov	Gordon	Park City High School	360
30-Nov	Gordon/Hutchinson	Park City High School	383
2-Dec	Cardinale	Mount Jordan Middle School	720
2-Dec	Gordon	The Canyons Ski Resort	68
3-Dec	Gordon	Kearns High School	1500
6-Dec	Sackett	Indian Hills Middle School	515
7-Dec	Gordon	Utah Valley State College	38
9-Dec	Gordon	Treasure Mtn. Middle School	610
10-Dec	Wewer/Hirchi	Ogden High School	100
10-Dec	Sackett	Camp Kostopholius	32
13-Dec	Snowbasin Crew	Snow Crest Jr. High School	300
16-Dec	Gordon	Brighton Ski Resort	200
22-Dec	Trotter	Orem High School	80
4-Jan	Bloom	Bountiful Jr. High School	140
4-Jan	Wewer/Hirchi	Bountiful Stake Center	100
6-Jan	Gordon	West High School	13
7-Jan	Cardinale	Waterford School	40
7-Jan	Gordon	Westminster College	9
10-Jan	Trotter	Utah Valley State College	18
10-Jan	Gordon	St. Ambrose Church	53
11-Jan	Trotter	Payson Jr. High School	118
13-Jan	Garcia	Merrill Lynch	32
16-Jan	Garcia	Camp Kostopholius	33
18-Jan	Cardinale	Murray High School	43
18-Jan	Hirchi	Clearfield Stake Center	38
19-Jan	Trotter	Novell	52

Know Before You Go Program			
Date	**Staff**	**Event**	**# People**
20-Jan	Gordon	Cottonwood High School	64
20-Jan	Cardinale	Evergreen Jr. High School	800
21-Jan	Gordon	Skaggs Catholic School	71
21-Jan	Kobernik	MiloSport Park City	25
24-Jan	Sackett	Churchill Jr. High School	250
26-Jan	Gordon	Westminster College	17
27-Jan	Hutchinson	Ecker Hill Middle School	24
28-Jan	Gordon	Oakley School	105
28-Jan	Kobernik	MiloSport Orem	30
29-Jan	Garcia	Camp Kostopholius	42
3-Feb	Gordon	Jordan High School	619
4-Feb	Nipkow	Wasatch Junior High School	885
7-Feb	Sackett	Churchill Jr. High School	539
7-Feb	Gordon	Snowbird Ski Resort	9
9-Feb	Gordon	Heber Ward	83
10-Feb	Gordon	Rocky Mtn. Middle School	603
11-Feb	Kobernik	MiloSport Salt Lake City	25
16-Feb	Gordon	Wasatch Alternative High School	33
16-Feb	Gordon	St. Mary's Catholic Church	63
16-Feb	Hirchi	Salt Lake City Boy Scout Troop	48
19-Feb	Gordon	Deer Valley-Private group	6
22-Feb	Hutchinson	Heber Junior High School	321
23-Feb	Trotter	Heber Junior High School	311
23-Jan	Gordon	Island View RTC	123
24-Jan	Gordon	Granite Park Middle School	131
25-Jan	Gordon	Creekside Hgih School	44
7-Mar	Bloom	Bountiful Jr. High School	101
23-Mar	Wewer	Weber State College	13
22-Apr	Gordon	McCollister Private School	23
29-Apr	Gordon	Morningside Elementary	528
		Total	**12,163**

UAC Media Contacts 2004-05

Date	Staff	Agency	Subject	National or Inter-national Television Interview	National or Inter-national Television Information	National or Inter-national Print Media	Local Television Interviews	National Radio Interviews	Local Radio Interviews	Local Print Interviews
9/1/2004	Tremper	Park City Record	Fundraiser							X
9/14/2004	Tremper	Ski Magazine	Article about thrill seekers			X				
10/13/2004	Tremper	New York Times	Education Programs			X				
10/13/2004	Tremper	Los Angeles Times	Avalanche Funding			X				
10/24/2004	Tremper	Deseret News	Recent Avalanches							X
10/25/2004	Tremper	KSL Radio	Recent Avalanches						X	
11/1/2004	Hardesty	Channel 2 TV	avalanche awareness				X			
11/8/2004	Lees	Daily Utah Chronical	general avalanche info							X
12/10/2004	Tremper	Channel 13	Avalanche information				X			
12/11/2004	Hardesty	Salt Lake Tribune	avalanche fatalities							X
12/11/2004	Tremper	Salt Lake Tribune	Avalanche Accidents							X
12/11/2004	Hardesty	KSL	avalanche fatalities				X			
12/11/2004	Tremper	Channel 5	Avalanche Accidents				X			
12/11/2004	Tremper	Channel 13	Avalanche Accidents				X			
12/11/2004	Tremper	Salt Lake Tribune	Human Factors in Accidents							X
12/12/2004	Hardesty	ABC, New York	avalanche fatalities	X						
12/12/2004	Tremper	Good Morning America	avalanche fatalities	X						
12/12/2004	Tremper	ABC News - Good Morning America	Avalanche Accidents	X						
12/13/2004	Hardesty	Deseret News	avalanche fatalities							X
12/14/2004	Tremper	Powder Magazine	Case study of an accident			X				
12/14/2004	Tremper	Weather Channel	Weather Warriors segment	X						
12/18/2004	Lees	KCPW morning talk show	general avalanche conditions						X	
1/6/2005	Tremper	Salt Lake Tribune	Update of Avalanche Conditions							X
1/7/2005	Tremper	Salt Lake Tribune	Update of Avalanche Conditions							X
1/8/2005	Tremper	Salt Lake Tribune	Update of Avalanche Conditions							X
1/10/2005	Lees	Fox 13	avalanche fatalities				X			
1/12/2005	Tremper	Las Vegas Review Journal	General Avalanche Informatin				X			
1/14/2005	Tremper	CNN	Interview on Dutch Draw	X						X
1/14/2005	Tremper	Salt Lake Tribune	Interview on Dutch Draw							X
1/14/2005	Lees	CBS national	avalanche fatalities	X						
1/14/2005	Tremper	Channel 5	Interview on Dutch Draw				X			
1/14/2005	Tremper	National ABC News	Interview on Dutch Draw	X						
1/14/2005	Tremper	National NBC News	Interview on Dutch Draw							
1/14/2005	Tremper	Associated Press	Interview on Dutch Draw			X				
1/15/2005	Lees	KSL	general avalanche conditions				X			
1/15/2005	Tremper	All National and Local News Outlets	Press Conference on Dutch Draw	XXXX			XXXX			
1/17/2005	Tremper	NPR Radio	Reecnet Accidents					X		X
1/18/2005	Tremper	Park City Record	Reecnet Accidents							
1/19/2005	Lees	CBS national	general avalanche info		X					
1/19/2005	Lees	Weather Channel	general avalanche information		X					
1/19/2005	Tremper	CBS National News	Reecnet Accidents	X						
1/19/2005	Tremper	Channel 5	Recent Avalanches				X			
1/22/2005	Tremper	Outside Magazine	Recent Avalanches			X				

UAC Media Contacts 2004-05

Date	Staff	Agency	Subject	National or Inter-national Television Interview	National or Inter-national Television Information	National or Inter-national Print Media	Local Television Interviews	National Radio Interviews	Local Radio Interviews	Local Print Interviews
2/25/2005	Tremper	Men's Journal	Avalanches and Rescue			X				
3/3/2005	Lees	KSL radio	avalanche conditions						X	
3/3/2005	Lees	Channel 5	avalanche conditions				X			
3/9/2005	Tremper	Reno Newspaper	Accident							X
3/9/2005	Tremper	Powder Magazine	Beacon Technology			X				
3/10/2005	Tremper	Outdoor Life Network	Avalanche Rescue	X						
3/17/2005	Tremper	KCPW Radio	Dutch Draw						X	
3/24/2005	Tremper	Deseret News	Avalanche Conditions							X
3/24/2005	Tremper	Channel 13	Avalanche Conditions				X			
4/20/2005	Tremper	Skiing Magazine	Rescue Technology			X				
5/12/2005	Tremper	Salt Lake Tribune	Wet Avalanche Cycle							X
5/12/2005	Tremper	Logan Herald Journal	Wet Avalanche Cycle							X
5/12/2005	Tremper	Channel 5	Wet Avalanche Cycle							X
5/12/2005	Tremper	Channel 4	Wet Avalanche Cycle				X			
5/25/2005	Tremper	Logan Herald Journal	Wet Avalanche Cycle							X
5/25/2005	Tremper	KSL Radio	Wet Avalanche Cycle						X	
5/25/2005	Tremper	Channel 13	Wet Avalanche Cycle				X			
6/3/2005	Tremper	Skiing Magazine	Avalanche Information			X				
				13	**3**	**15**	**19**	**1**	**6**	**21**
								Total		**78**

An unusual debris pile: This was actually a new avalanche over running an old debris pile

Photo: Bill Nalli

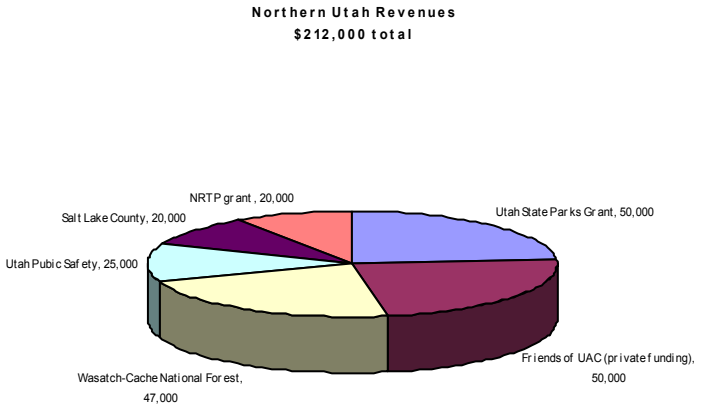
UAC Media Contacts 2004-2005										
Date	**Staff**	**Agency**	**Subject**	**National or Inter-national Television Interview**	**National or Inter-national Television Information**	**National or Inter-national Print Media**	**Local Television Interviews**	**National Radio Interviews**	**Local Radio Interviews**	**Local Print Interviews**
1/15/2005	Tremper	All National and Local News Outlets	Press Conference on Dutch Draw	XXXX			XXX X			
1/18/2005	Tremper	Park City Record	Reecnet Accidents							
1/19/2005	Tremper	CBS National News	Reecnet Accidents	X						
1/31/2005	Tremper	Powder Magazine	Human Factors in Accidents			X				
1/28/2005	Tremper	New Yorker Magazine	Andrew McLean			X				
1/22/2005	Tremper	Outside Magazine	Recent Avalanches			X				
1/19/2005	Tremper	Channel 5	Recent Avalanches				X			
1/22/2005	Tremper	Call Radio	Recent Avalanches						X	
1/30/2005	Tremper	Newsweek Magazine	Avalanche photo published			X				
2/5/2005	Tremper	New York Times	Andrew McLean			X				
2/25/2005	Tremper	Men's Journal	Avalanches and Rescue			X				
2/22/2005	Tremper	Skiing Magazine	How to Stay Alive			X				
3/9/2005	Tremper	Powder Magazine	Beacon Technology			X				
3/10/2005	Tremper	Outdoor Life Network	Avalanche Rescue	X						
3/17/2005	Tremper	KCPW Radio	Dutch Draw						X	
3/24/2005	Tremper	Channel 13	Avalanche Conditions				X			
4/20/2005	Tremper	Skiing Magazine	Rescue Technology			X				
5/12/2005	Tremper	Channel 4	Wet Avalanche Cycle				X			
5/25/2005	Tremper	KSL Radio	Wet Avalanche Cycle						X	
5/25/2005	Tremper	Channel 13	Wet Avalanche Cycle				X			
6/3/2005	Tremper	Skiing Magazine	Avalanche Information			X				
				13	**3**	**15**	**19**	**1**	**6**	**21**
Total										**78**

Budget

The Forest Service Utah Avalanche Center is the epitome of a successful community partnership. Funding comes primarily from outside the Forest Service including grants from Utah State Parks, the National Recreation Trails Program, Utah Department of Public Safety and Homeland Security, Salt Lake County and private fundraising by the Friends of the Utah avalanche Center.

We are especially indebted to Utah State Parks and Recreation, who has provided the primary funding to the Forest Service Utah Avalanche Center through grants, both from the National Recreation Trails Program and a grant directly from State Parks. This season, they included the avalanche funds in a line item in their regular budget and it was approved by the legislature. This means that we no longer have to compete for grants each season. We just signed a 5-year funding agreement for $82,000 per year, which greatly helps to stabilize and expand avalanche forecasting in Utah. Special thanks go to Fred Hayes at Utah State Parks and Recreation for his unflagging support.

Wasatch-Cache National Forest	$47,000	This includes $10,000 to cover overhead collected from external sources.
Utah State Parks and Recreation grant	$50,000	This funds avalanche forecasting for Logan and the western Uinta Mountains.
National Recreation Trails Program (administered by Utah State Parks and Recreation)	$20,000	$20,000 goes to northern Utah and an additional $12,500 funds weekend and holiday forecasts for the Manti-Skyline, which is provided by the Manti-La Sal National Forest.
Friends of the Utah Avalanche Center (private fund raising)	50,000	About half of this money is spent directly by the FUAC, some goes to the Know Before You Go avalanche education program, and about $20,000 per year is contributed to the Wasatch-Cache National Forest.
Salt Lake County	$20,000	
Utah Public Safety	$25,000	
Total	**$212,000**	This includes all money spent on avalanche forecasting in northern Utah, including private funds spent outside the Forest Service.

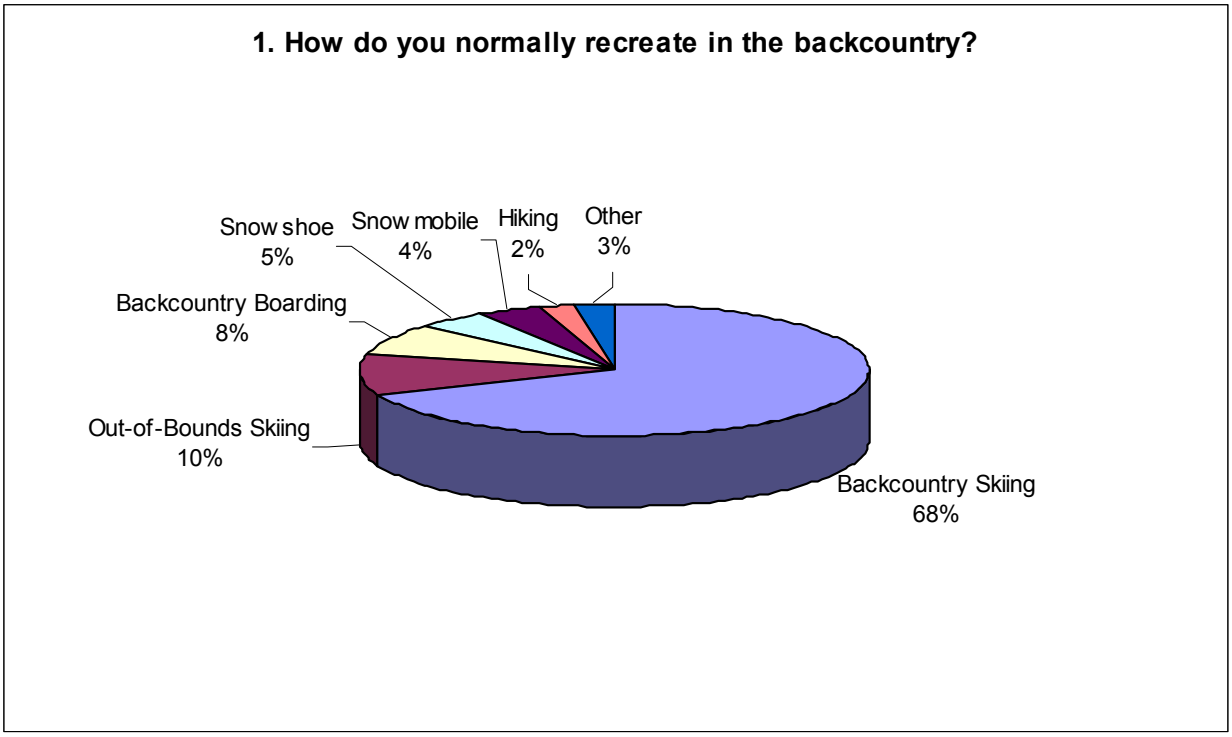


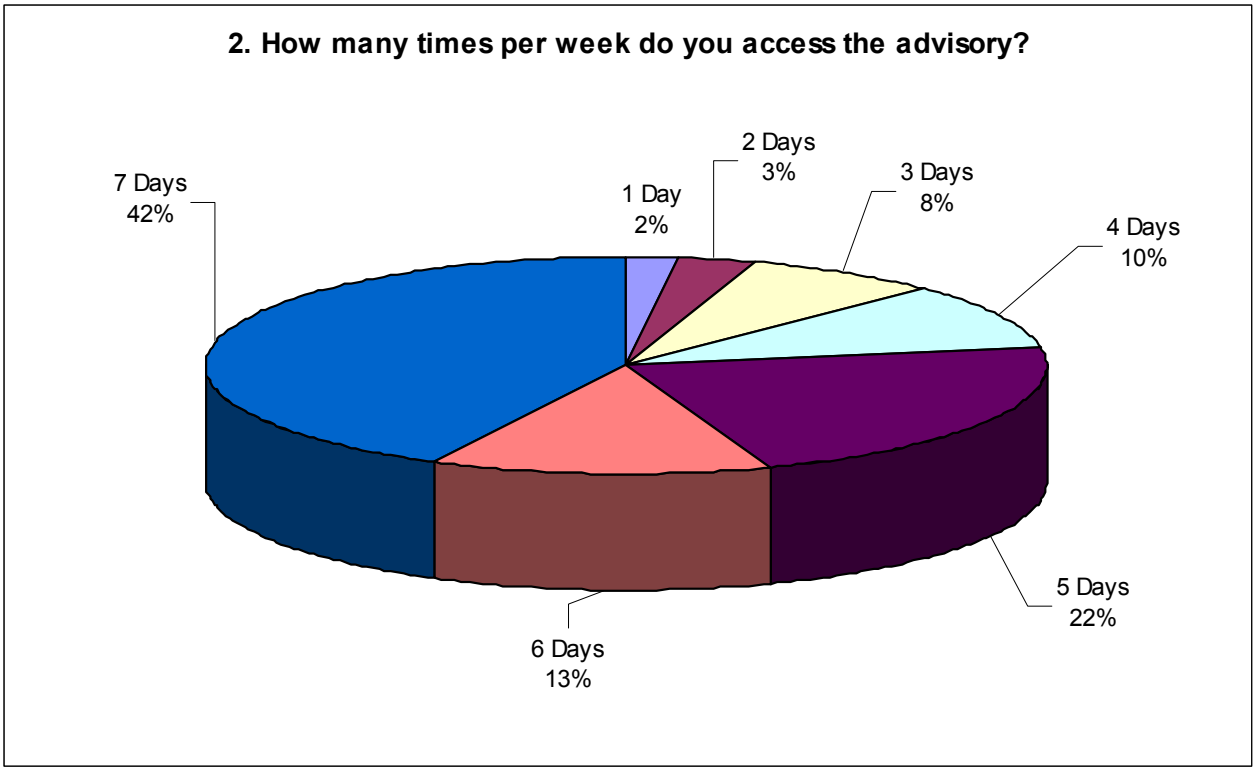
Note: Staff salary and benefits is spread between six people, most of which work six months per year and the Director works eight months per year. Utah State Parks contributes a total of $85,000 but $15,000 of that money goes to the Manti-La Sal National Forest for avalanche forecasting and education in the La Sal Mountains and for the Manti-Skyline area.. Finally, as noted above, the Friends of the Utah Avalanche Center donate $15,000 to the Forest Service for salaries, but they spend an additional $35,000 per year on their own to hire contract observers, avalanche education projects and for equipment. These expenses are not itemized here.

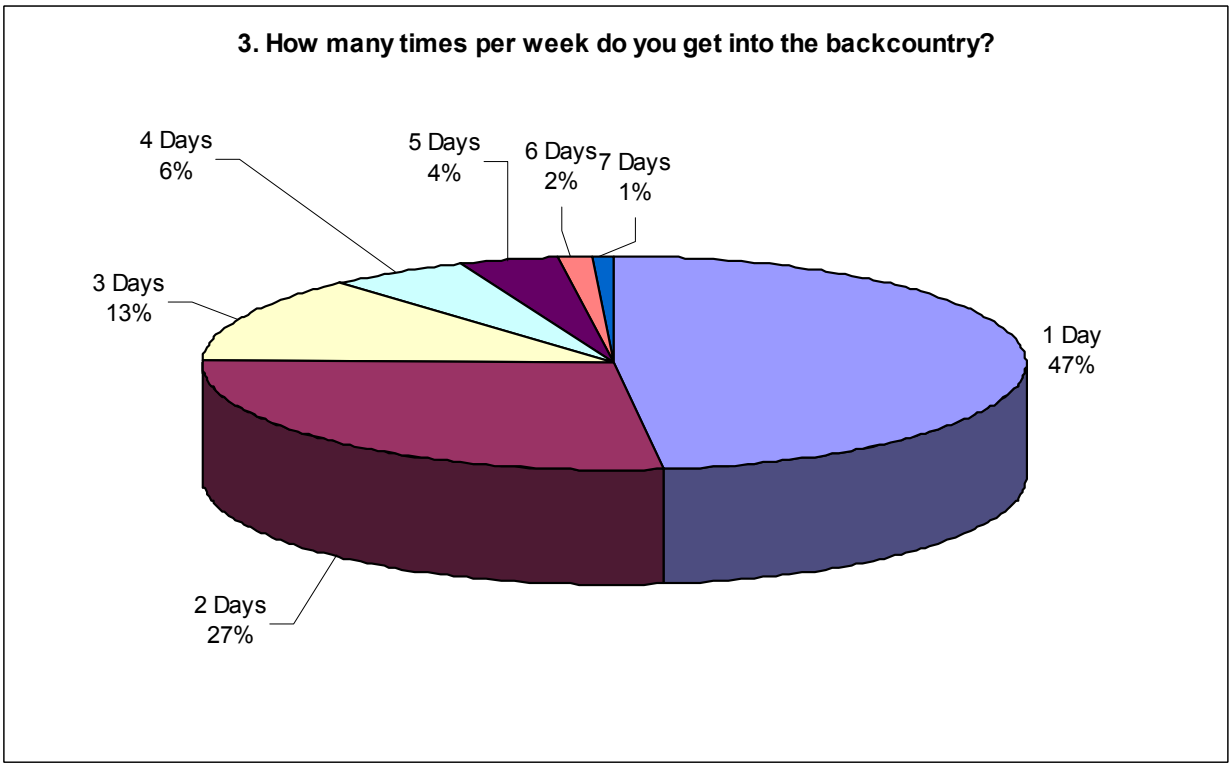
User Survey

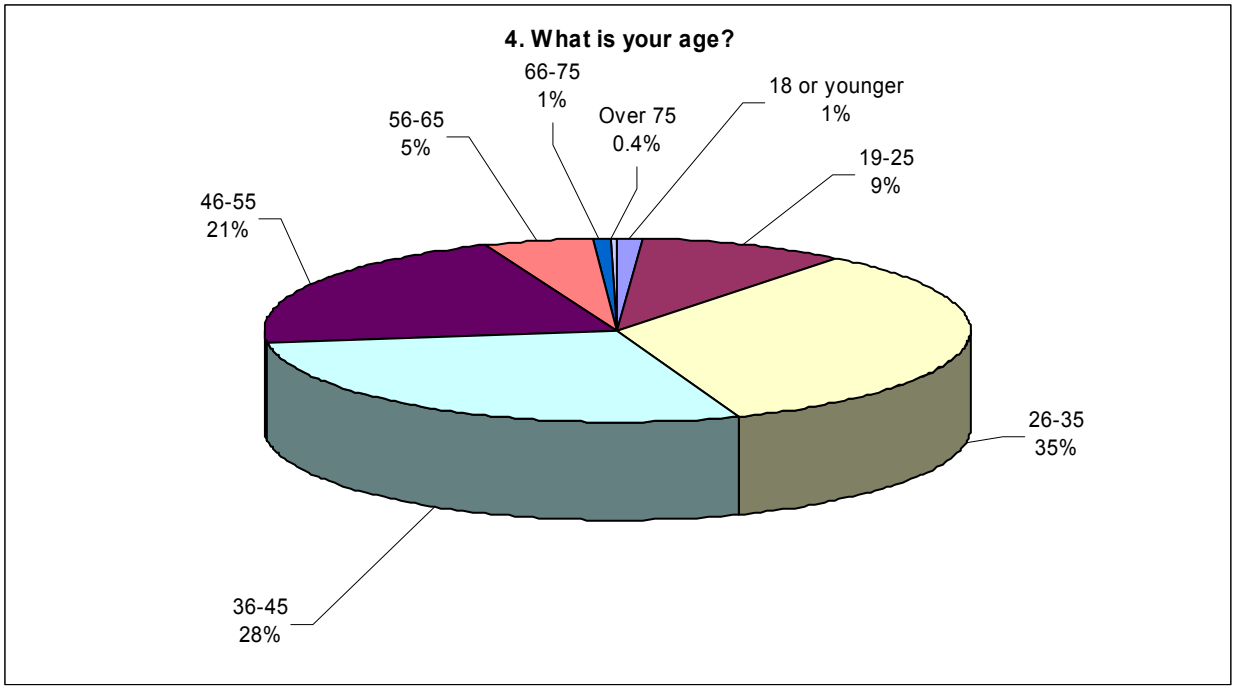
This season we conducted an online user survey of our customers and the following graphs indicate the results. Over 1150 people responded to the survey. Although we asked people each day on the recorded telephone advisory to go to our web site to complete the survey, because it is an online survey it no doubt under represents the customers who only access the advisory via the recorded telephone line and on public radio. Nevertheless, we feel that we received some valuable information about our customers.

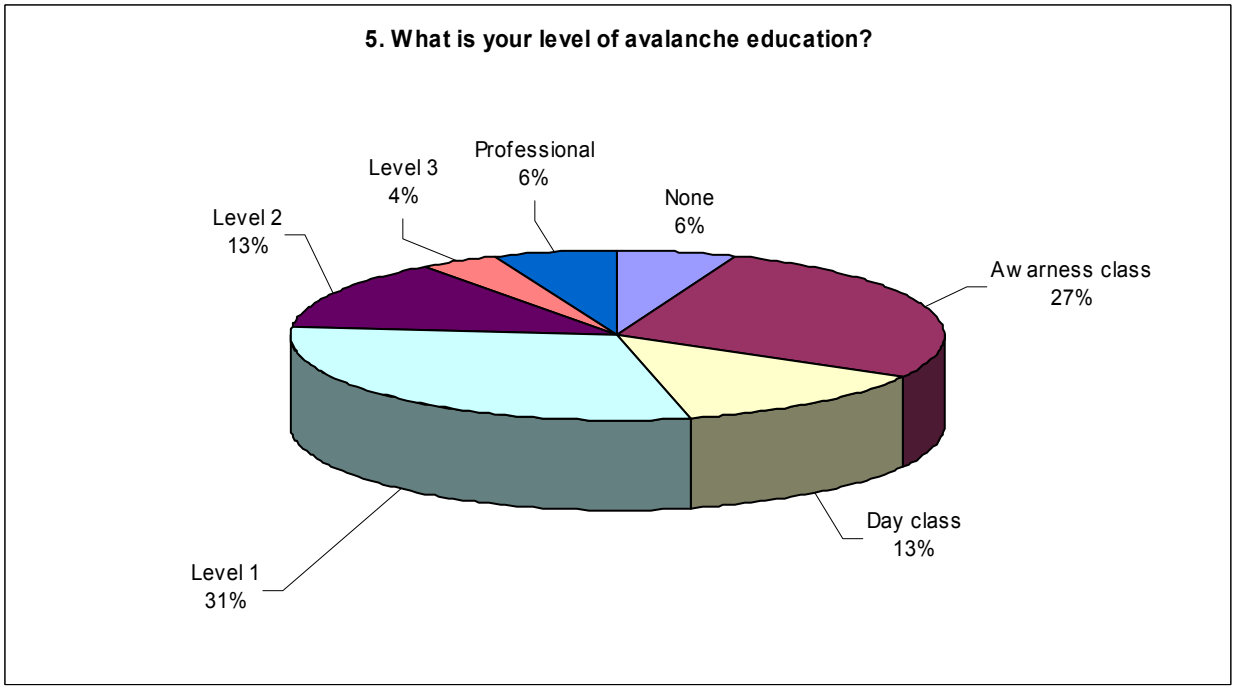
In summary, they are primarily backcountry skiers (outside of the Wasatch Range snowmobilers probably represent the largest group). They access the advisory regularly through the week, usually via the automated e-mail and Internet. Amazingly, the respondents access the advisory via the telephone only 13 percent of the time. (The survey of backcountry users in Sun Valley Idaho indicated an even lower percentage and in Canada telephone use is under one percent.) In other words, it is clear that we should continue our trend of developing Internet-based products for the public. Also, our customers seem quite avalanche educated and they seem to favor a mix of graphics and text to communicate avalanche danger to the public.

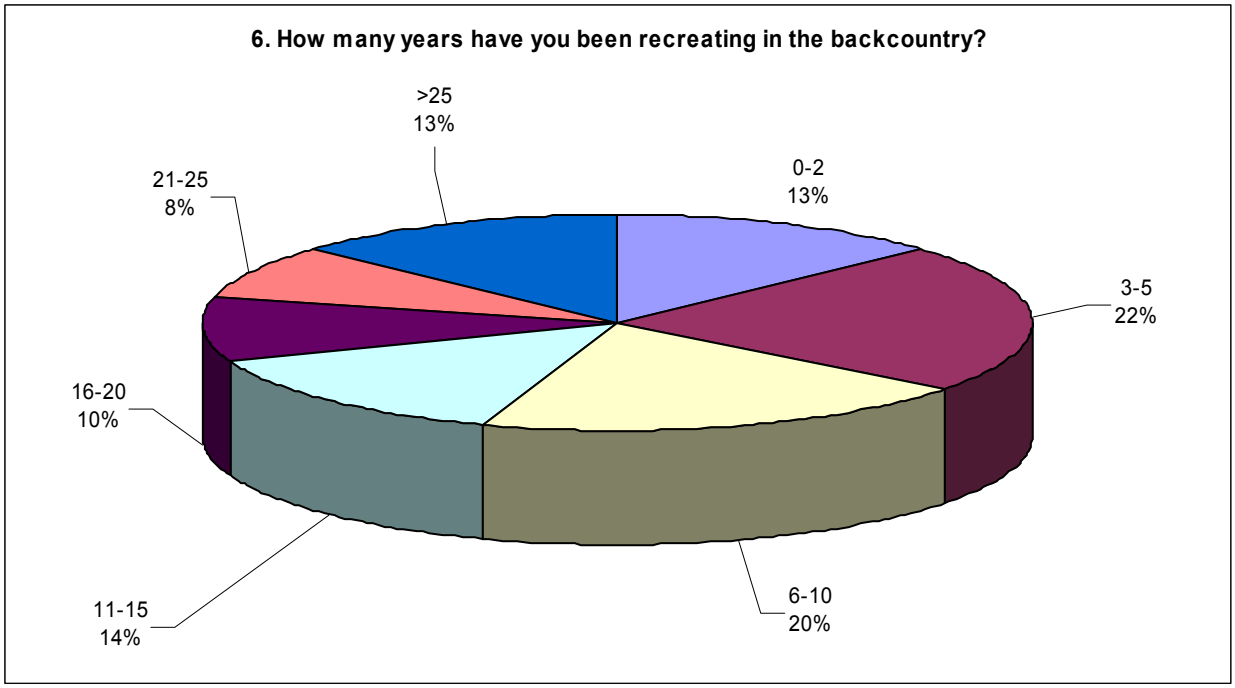


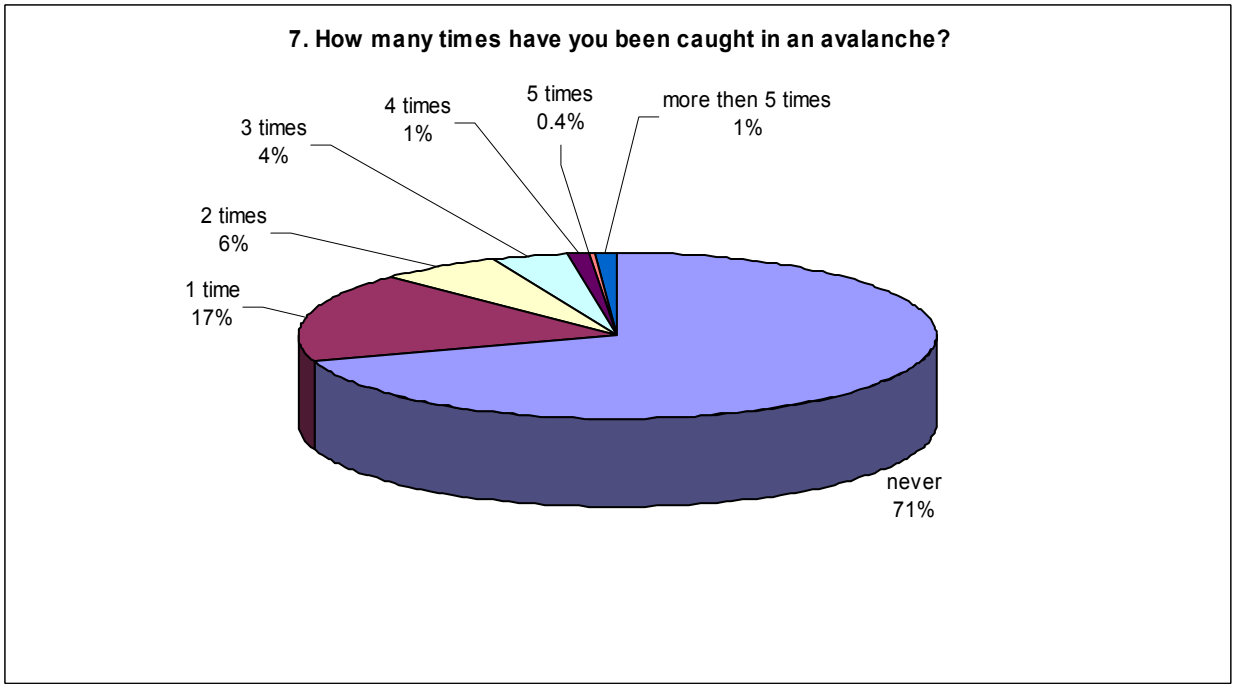

2. How many times per week do you access the advisory?
7 Days
42%
1 Day
2%
2 Days
3%
3 Days
8%
4 Days
10%
5 Days
22%
6 Days
13%


3. How many times per week do you get into the backcountry?
4 Days
6%
5 Days
4%
6 Days
2%
7 Days
1%
3 Days
13%
1 Day
47%
2 Days
27%

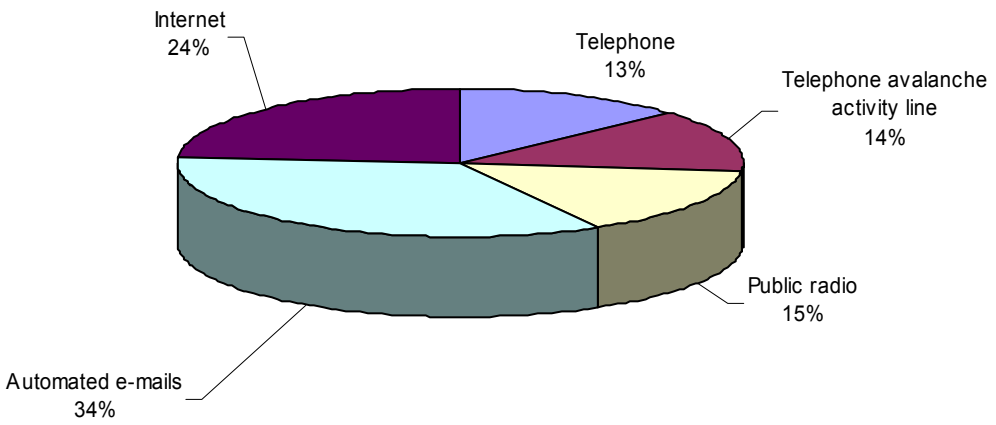

4. What is your age?
66-75
1%
18 or younger
1%
56-65
5%
Over 75
0.4%
19-25
9%
46-55
21%
26-35
35%
36-45
28%


5. What is your level of avalanche education?
Professional
6%
Level 3
4%
None
6%
Level 2
13%
Awarness class
27%
Day class
13%
Level 1
31%

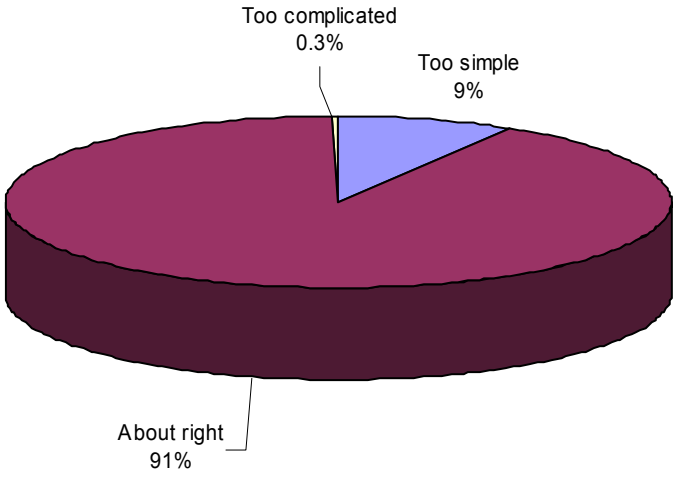

6. How many years have you been recreating in the backcountry?
>25
13%
0-2
13%
21-25
8%
3-5
22%
16-20
10%
11-15
14%
6-10
20%


7. How many times have you been caught in an avalanche?
4 times
1%
5 times
0.4%
more then 5 times
1%
3 times
4%
2 times
6%
1 time
17%
never
71%

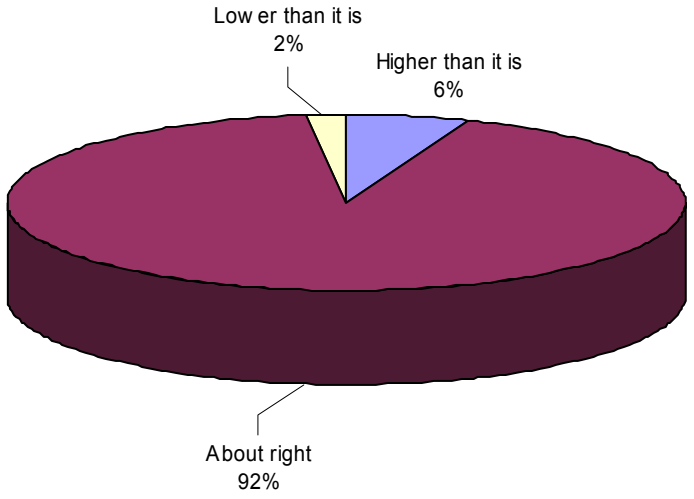
8. How many times per week do you access the advisory from the following sources?



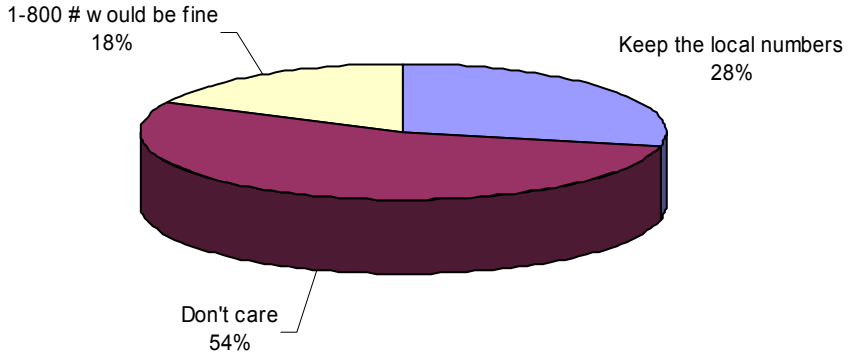
10. Complexity of the information?



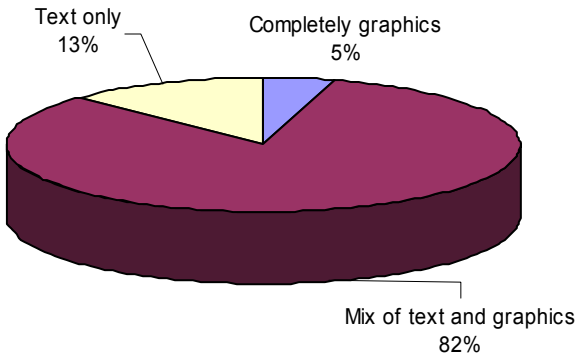
11. Concerning our danger ratings, do we consistently rate the danger:



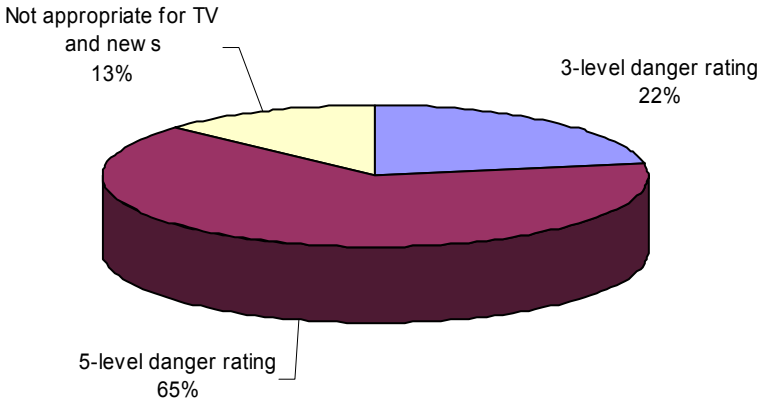
12. How do you feel about calling a 1-800 number to access an advisory for the Wasatch Range as opposed to the customized local numbers for SLC, Park City, Alta, Ogden and Provo?



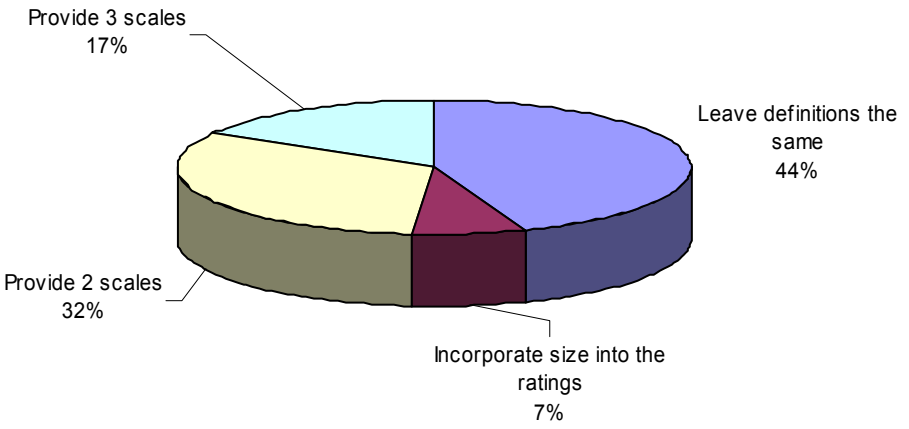
13. When you access the advisory on the Internet, what do you think is the best way to present avalanche and weather information?



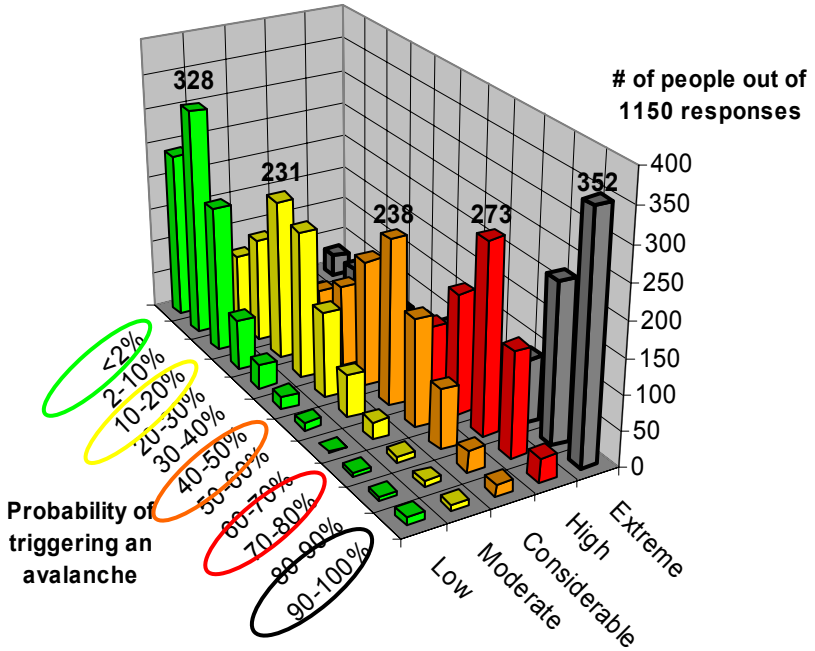
14. We would like to publish the overall, regional, avalanche danger rating in the newspaper each day in the weather section and on the TV weather forecast. Which method would work best to reach people who don't normally consult the advisory?



15. The current international standard 5-level avalanche danger rating definitions are based only on the probability of human triggered and natural avalanches, not on avalanche size. Would you prefer to:



What do you think is the probability of triggering an avalanche during different danger ratings?



AVALANCHE ADVISORY
SUNDAY, DECEMBER 12, 2004 7:30 AM

Good morning, this is Drew Hardesty with the Forest Service Utah Avalanche Center with your back-country avalanche and mountain weather advisory. Today is Sunday, December 12, 2004, and it's 7:30 am.

A SPECIAL AVALANCHE ADVISORY REMAINS IN EFFECT FOR THE MOUNTAINS OF NORTHERN UTAH, TO INCLUDE THE WESTERN UINTAS.

Current Conditions:
Despite mostly clear skies, mountain temperatures stayed above freezing at all locations below 11,000'. Winds were from a westerly direction in the mid-twenties to mid-thirties yesterday, and are now averaging 15-25mph along the highest ridgelines. Snow surface conditions range from mostly supportable to breakable on the steep sunny slopes with dense settled powder on protected shady slopes.

Avalanche Conditions:
It continues to be very dangerous in the backcountry with more tragic events and near misses occurring in the mountains. There is a confirmed snowmobiler fatality yesterday in the Western Uintas above Strawberry Reservoir, two missing snowshoers in upper Mineral Fork canyon in mid-Big Cottonwood Canyon, and multiple near misses in the Logan, Ogden, and Salt Lake mountains. Craig Gordon and Bruce Tremper will try to complete investigations on these incidents today, and my photos/investigation on the Twin Lakes fatality from Friday are posted on our website. Near misses include three snow-machiners caught and carried in an avalanche near Mt. Naomi up near Logan, a burial and live recovery near Bountiful Peak, and a remotely triggered slide (another photo) in Alexander Basin that took out the previous run's tracks. There was also a report of at least one avalanche along the Park City ridgeline that ripped out to the ground and a reported natural off Tuscarora in upper BCC that was 2-3' and 200' wide. And it should come as no surprise that explosive control work in uncompacted terrain at the ski areas continues to release large and destructive avalanches. These dimensions are on the lower end of the average slides taking place in the backcountry.

For today, human triggered avalanches will continue to be probable in steep terrain. Any slide triggered will likely be large and very dangerous as plenty of the slides have been tree-snappers. Avalanches can still be triggered from a distance and from lower angled terrain. With these hard slabs, it will be possible to trigger a slide down on top of you from the valley below, or get dragged from lower angled terrain that's attached to a steeper adjacent slope. Most old-timers are at the resorts, rock climbing, or hiding under the bed.

Also yesterday's gusty winds may have produced some sensitive wind drifts along the upper elevations. Finally, today's extremely warm temperatures will cause continued wet sluffing, rollerballs and occasional wet slabs at lower elevations and on sun exposed slopes.

Bottom Line (Salt Lake, Park City, Ogden, and Provo mountains): The danger remains **CONSIDERABLE** on and below any steep slope at the mid and upper elevations. Those without excellent avalanche and route finding skills should avoid the backcountry. Human triggered avalanches will be probable, with naturals possible.

Mountain Weather:
It'll be mostly sunny with 10,000' temps near 40 with 8000' highs in the upper 40's, again. Winds will be 15-20mph from the west. A weak brush-by on Monday and a chance of some more snow by about

mid week.

If you are getting out, drop us a line or an email with any reports or observations from the backcountry. You can leave us a message at 524-5304 or 1 800-662-4140. Email us at uac@avalanche.org, or send a fax to 524-6301.

The information in this advisory is from the US Forest Service, which is solely responsible for its content. This advisory describes general avalanche conditions and local variations always occur.
I will update this advisory by 7:30 Monday morning, and thanks for calling.

Scotties Bowl - an old avalanche path with a new hair cut.. Photo: Brett Pelletier

Newspaper Articles

Note: In the past, the Wasatch-Cache National Forest saved newspaper articles about the Forest Service and we posted the avalanche stories in our annual report. They ended the practice this winter and we do not have the time or resources to clip all the avalanche articles, so we have included only the few articles we managed to save this winter. There was perhaps ten times more articles published than reprinted here.

Killer slide

Two to five people are missing, presumed dead; no exact information may be available for a while

Where it happened

About Dutch's Draw
The area is adjacent to The Canyons ski resort. The steep area must be accessed through a gate that warns skiers of potential hazards.

Avalanche deaths of '04-05 winter

Jan 8, 2005: Snowboader Garett Louk Gordon, 26, was buried in an avalanche in Ephraim Canyon. About an hour later snowmoblier David Wayne Johnson, 42, was buried in an avalanche east of Mount Pleasant.

Dec. 11, 2004: Bruce Quint, 59, and Melvin Denis, 32, were caught in an avalanche in Big Cottonwood Canyon .

Dec. 10, 2004: Zachary Eastman, 23, was in the Grizzly Gulch backcountry area of Little Cottonwood Canyon.

Dec. 11, 2001: Troy Tolbert, 42, of Alpine

- The avalanche occurred above Dutch's Draw at about 1:30 p.m.; authorities noted there were multiple victims, but a number wasn't available.
- It was as much as 500 yards wide at the top, half a mile long and was nearly 30 feet deep at its stopping point.

How it happened

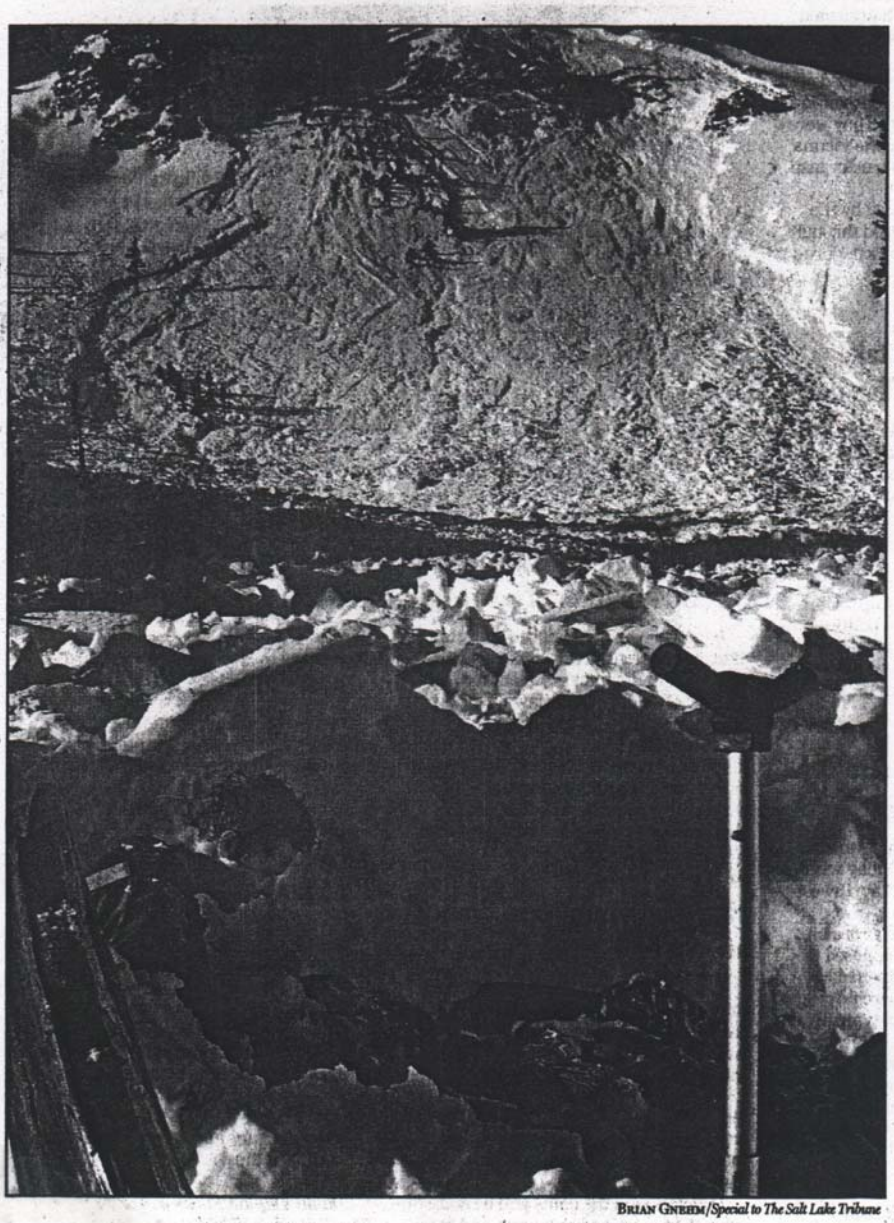
There were two weak layers in the snowpack: one from November and another from December. A fresh layer of snow fell on top of a pre-existing weak layer.

Northwest winds since Wednesday made the problem worse.

Skiers likely caused the fresh surface to slide, triggering the avalanche.

The deadliest season

Through the eyes of an avalanche forecaster and two men who narrowly escaped a snowslide, a look back at the avalanches that killed a record eight people in Utah



BRIAN GNEHM/*Special to The Salt Lake Tribune*

Trace Workman comforts Ben DeJong after he was buried by an avalanche on Dec. 11. For video footage of the slide, go to http://www.sltrib.com.

BY LISA ROSETTA
The Salt Lake Tribune

The December sun beating on his face, Trace Workman fell to his knees on the avalanche-churned snow and prayed.

Beneath him, buried in 5 feet of snow, his friend, Ben DeJong was gasping for air.

"Not him — not this time," Workman pleaded, his frozen hands clasped together.

Then he began digging.

In his 19 years as a ski patrol and avalanche forecaster, Craig Gordon had never seen anything like it.

While it's not unusual for avalanches to snap trees like toothpicks, these were plucking large Engelmann spruce and Douglas fir like weeds — by the root. Hard slabs of snow were breaking into truck-size pieces and plowing down Utah slopes with the force of a freight train, Gordon said. It was the avalanche equivalent of a tsunami.

By March 31, eight people had perished in slides, the most since 1951, when the U.S. Forest Service Utah Avalanche Center began keeping record.

All eight were men, average age 35. Together, they comprise 30 percent of the 26 avalanche deaths in the United States this winter season.

Gordon said he is surprised there weren't more deaths in an avalanche season he calls "historic."

See **DEADLIEST SEASON**, A8

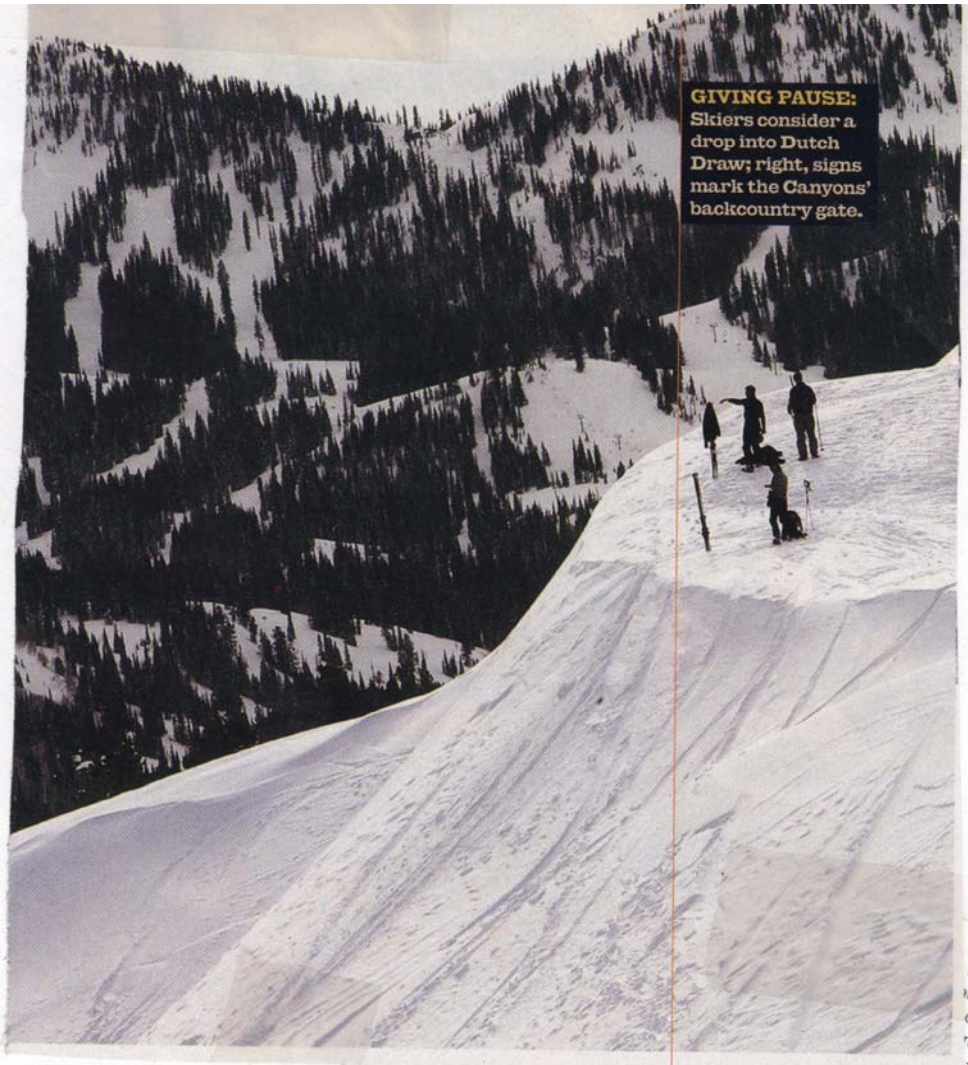
Lethal numbers

8 Number of avalanche deaths in Utah this season

30 Percent of avalanche deaths nationwide that occurred in Utah

300 Slides in Utah from Oct. 24 to April 10

58 Percent of Utah avalanches triggered by people



GIVING PAUSE: Skiers consider a drop into Dutch Draw; right, signs mark the Canyons' backcountry gate.

...ne of us is," says Bruce Tremper, director of the Forest Service's Utah Avalanche Center. "I could've done that." He blames distorted perception, which can tell you a slope is safe if it's been skied, even if your training screams the opposite.

...we couldn't be that stupid, but ...nusiasm. ...actors like

This is why Tremper and others are worri... the exploding interest in backco... via chairlifts. An up... snow...

We'd like to think education matters. But most backcountry fatalities are experienced people taking chances.

...last seven years, with some days seeing more than 200 ...les of alpine-touring gear—setups that allow for climbing ...creased 69 percent from 2003 to 2004, according to ...merica.

...-sport filmmakers are partly behind the trend, having ...avalanche, *The New York Times* published a story on lift-accessed back- ...trail skiing as pedestrian. Only a month before the Dutch ...country runs that proclaimed, "Out-of-bounds is hot," and called groomers "soporific." *Outside* celebrated the reemergence of the practice in 2001.

Resorts have played along. In some cases they're bringing extreme terrain inbounds and controlling it for avalanches. Elsewhere, they're simply opening ...gates. Since 1999, Wyoming's Jackson Hole Mountain Resort has allowed ...backcountry access regardless of snow stability, providing avalanche fore- ...casts and guided tours. (This option is no guarantee of safety: The day after ...e Dutch Draw slide, a Jackson client had to dig his injured guide out of an ...alanche.) The Canyons leaves its gates open, too, but posts an extreme ...ning, regardless of the hazard. "They're responding to a demand for more ...enture," says National Ski Areas Association president Michael Berry.

Will they respond to Maixner's death? Probably not. Resorts aren't liable once you head out of bounds. The Canyons is on private property but, like most western ski areas, surrounded by national forest. These resorts are obligated to provide for public safety, which they do by maintaining slopes and posting boundaries, but they can't stop you from heading through backcountry gates. Many also offer

KEEPING YOUR HEAD ABOVE SNOW

THE NEW YORK TIMES, SUNDAY, NOVEMBER 14, 2004

As backcountry skiing booms, so does instruction on handling the avalanche danger out of bounds

By BONNIE TSUI

As ski season approaches, ski resorts and other organizations across the country have begun stepping up their backcountry education and avalanche safety initiatives. For good reason: a lot more people are heading out into the backcountry on their skis, ratcheting up both the excitement and the danger factors.

In the 2002-3 season the number of avalanche fatalities in North America reached a record, 58. Half of those were backcountry skiers and snowboarders, including a group of high school students on a class trip, experienced backcountry guides, and a world champion snowboarder, according to the Forest Service National Avalanche Center. (The others killed included climbers, snowmobilers, hikers and snowshoers.) Last season, there were 32 fatalities, 10 of them involving skiers and snowboarders.

"In the last two decades, backcountry skiing and snowboarding has definitely been growing," said Craig Dostie, publisher of Couloir, a backcountry adventure magazine based in Truckee, Calif. "The sport used to have the reputation that you had to be an extreme skier to go into the backcountry, but now it's the cool thing to do, adventure-wise. There's of course the avalanche danger, which is unpredictable, and it can certainly kill you whether or not you are prepared."

Those who go out of bounds near a ski area can often be less experienced and less likely to recognize the dangers of unstable snow. Thus, the ski industry is responding with education programs designed to heighten awareness and minimize the risk.

At Kirkwood Mountain Resort near Lake Tahoe, Calif., the dramatic popularity of the resort's out-of-bounds areas led to the creation of the Expedition Kirkwood program last year. More than 100 guests signed up last season for backcountry awareness clinics, avalanche beacon training sessions, and Sno-Cat skiing tours and hikes that focus on backcountry safety.

Beacon Basin is an avalanche-training facility at Kirkwood run in partnership with Backcountry Access, which makes snow safety equipment. Participants are taught how to use avalanche beacons to locate a buried skier or rider. Eleven avalanche transmitters are permanently buried in a snowfield for beacon users to practice location skills. Training at Beacon Basin is also part of daylong backcountry awareness courses, which are offered monthly and focus on learning about snow conditions, risk assessment and safety procedures. Expedition Kirkwood's programs range from two hours to two days.

Photographs by Corey Hendrickson

Checking avalanche transceivers in the backcountry in Jackson Hole, Wyo.

Outside a resort's boundaries, skiers and riders have to depend on their own knowledge and snow safety skills, said Tracy Miller, a Kirkwood spokeswoman. "The backcountry terrain outside Kirkwood's boundaries is very steep — Class A avalanche terrain — but unlike the resort, there is no snow safety work performed," she said. "For the most technical skier or rider, it can be treacherous. For the inexperienced, it can be deadly."

Many resorts offer avalanche and backcountry awareness sessions during the National Ski Area Association's National Safety Awareness Week, Jan. 15 to 21. The ski areas include Beaver Creek and Breckenridge, both in Colorado, and Big Mountain, Mont., which uses an avalanche-rescue-dog program called Powder Hounds to attract younger skiers and snowboarders. "We try to teach people the basic knowledge of traveling in the backcountry, including route selection, equipment use, weather effects on the snowpack, and how to proceed in your group safely once you've decided to descend," said Addy McCord, patrol director at Beaver Creek. "Always watch your partner, always have an escape route, things like that."

On Feb. 5, Arapahoe Basin, Colo., will hold its third annual Beacon Bowl and Avalanche Awareness Day, which invites participants to test the latest avalanche gear and to attend clinics; there is also a time trial competition to find a buried avalanche beacon; all proceeds benefit the Colorado Avalanche Information Center. Other areas offering programs are Snowbird in Utah; Summit in Snoqualmie, Wash; Squaw Valley in California; and Telluride in Colorado, which in its annual three-day Telluride Avalanche School (Jan. 3 to 5 this season) gives students American Avalanche Association Level 1 certification.

"When you look at all the avalanche accidents, especially the recent accidents, you have about half knowing what they're doing, but the other half just don't know anything — they're completely uneducated and bumble into a dangerous situation," said Bruce Tremper, director of the Forest Service Utah Avalanche Center, which teaches dozens of avalanche courses each season. Last year, three young snowboarders died in an avalanche near Aspen Grove in Utah.

This month, the Utah Avalanche Center joined with the online gear retailer Backcountry.com and other partners in an avalanche safety campaign geared to school-age children and young adults, called Know Before You Go. The program includes a narrated video with extensive footage of avalanches, local avalanche professionals telling stories about close calls or accidents they have experienced, and presentations on basic avalanche signs and safety practices. The program will begin in Utah schools, but will be used as a model for mountain communities across the country.

"What's happened over the course of the last 10 years is that the gear and the technology far outpace people's avalanche skills," said Craig Gordon, an avalanche forecaster and director of the Know Before You Go program. "So they're able to get out into the conditions, but then they don't know how to handle themselves or recognize basic instabilities. That's where the danger is."

Those who venture off piste should have proper backcountry safety equipment with them and know how to use it, said Greer Terry, communications coordinator for Jackson Hole Mountain Resort. "Our backcountry is one of the primary things that the resort is known for," Ms. Terry said. "Our open-gate policy means that there are actual gates around our perimeter. There are warning sounds telling you that you are leaving the patrolled area, indicating the avalanche danger for the day, and if you choose to, you can go out of the gates and access over 3,000 acres of amazing terrain. But once you leave the resort, it's hike to and hike out, and you're on your own, so it's important that people know what they're doing." ■

BONNIE TSUI writes about travel for the Escapes section.

Avalanche danger program targets teen boarders, skiers

By Brett Prettyman
The Salt Lake Tribune

Craig Gordon can rap off an impressive list of avalanche statistics from memory, but there is one number that sticks on his tongue longer than others.

Twenty-nine people have died in Utah avalanches in the past eight years.

Aiming to reduce and eventually even eliminate the number of deaths, Gordon is taking the Forest Service Utah Avalanche Center's "Know Before You Go" education program to school.

On Monday, Gordon presented the new hourlong presentation, designed to connect with students, at Rowland Hall-St. Marks private high school in Salt Lake City. More than 30 additional

See **EDUCATOR,** C8

Craig Gordon of the Utah Avalanche Center conducts an avalanche safety demonstration last season. This year, Gordon is pushing safety awareness among teens, who sometimes are overly adventurous in the backcountry.

Trent Nelson
Tribune file photo

Educator takes avalanche info into schools

● Continued from C1

presentations are planned for high school, junior high school and colleges this winter.

Eight of the fatalities in the past eight years were snowboarders ages 16 to 21. Gordon said he is targeting that age group because they spend significant time in the backcountry.

The program's Warren Miller-like footage of extreme winter recreationalists, hip music and words of caution from the pros seemed to reach the students at a school where 80 percent of them participate in a winter sports program each Friday.

"Some of them will use what they learned here today this weekend and some may not use it for another 10 years," Gordon said. "The point is instilling in them the indicators of possible avalanches and helping them realize the consequences of those decisions to stay [on the mountain] on days when they should go home."

Cameron Carpenter helped Gordon drive home the word on consequences.

"I wish I had something like this when I was in high school," Carpenter told students before sharing the story of losing his best friend, Brad Lindsey, in a Big Cottonwood Canyon avalanche in 1986. "Maybe I wouldn't be here if I had."

Carpenter said he knew about the Utah Avalanche Center's hot line (801-364-1581 in Salt Lake City) when he was a student at East High School in the mid-1980s, but that he and his friends never dialed it. After reading about the deaths of three young snowboarders near Sundance last winter he wondered why they didn't call the hot line either.

"I realized there was still a large chasm between those who know about avalanche safety and education and those who don't. Kids at that age think they are invincible," Carpenter said.

Carpenter volunteered to help the Utah Avalanche Center "go to the kids because they won't come to us."

Students at Rowland Hall appreciated that the program was targeted toward them.

"I went to one [avalanche safety clinic] before, and I was the only person under 20," said freshman Connor Barton. "I like this one better."

Barton said he has felt the lure of backcountry powder.

"You get to the [out of bounds] rope and you see a lot of good powder on the other side," Barton said. "You start to think 'What does moderate [avalanche danger] really mean?' "

Barton and several other students admitted they had entered or thought about going into the backcountry when they probably shouldn't have and could relate to Carpenter's tale of laughing off the danger of avalanche when he was a teenager.

"You never think it will happen to you, but when you see somebody who it happened to it makes you realize it can," said senior Andy Schwarz.

Junior Hunter Jackson said he understands the message of having the right safety equipment for backcountry travel, but is frustrated by the cost of the gear.

"I can't afford a $400 avalanche beacon, but I can pick up the phone and get a report," Jackson said.

bpretty@sltrib.com

Avalanche program receives donation

By MATT OTTINGER
Herald Editor

EVANSTON–Considering the amount of snow that has already fallen in the Uinta Mountains this year, the Utah Avalanche Center wishes to encourage those heading into the mountains to refrain from taking chances with their safety.

"It's unusual to have this much snow at this time of year in the mountains (approximately four feet as of Tuesday morning), and we've already had a couple close calls the past couple of days in the central Wasatch area," said Forest Service Utah Avalanche Center forecaster Craig Gordon.

"If people go out to the back country, they should take a beacon, shovel, and a probe in case an avalanche should occur. We also like for people to go out with partners.

"This time of year, people don't think of it as winter and sometimes don't take the necessary precautions," Gordon added. "But if there's enough snow to ride on, there's enough for an avalanche."

The avalanche center recently received a $250 donation from the Bear River Outdoor Recreation Alliance to be used toward equipment that will help the center gauge avalanche potential.

"The Western Uintas have been hard to figure out in the past in terms of what the weather is doing," said Gordon. "It's important for us to know what the wind is doing, since it can form snow drifts and slabs, and those slabs tend to be what people get caught up in during an avalanche. These instruments will help us evaluate real-time data, which will be available to the public throughout the winter."

For those who are planning to head into the Western Uintas and would like to view an updated avalanche forecast, please visit www.avalanche.org/~uac or call 1-800-648-7433.

Barb Couture of the Bear River Outdoor Recreation Alliance hands a $250 check to Craig Gordon of the Forest Service Utah Avalanche Center. The money will be used for the purchase of weather instrumentation that will be used to detect avalanche potential in the Uinta Mountains. Pictured are (left to right) Gordon, Couture, and Ted Scroggin.

Slides trap six in backcountry

● Continued from B1

director of the Utah Avalanche Forecast Center.

"We have had close to 70 inches of new snow since [March 19]. Most avalanche accidents happen on the first sunny day following the storm. Temperatures are expected to rise rapidly over the weekend and that will increase the avalanche danger," said Craig Gordon, forecaster for the Utah Avalanche Forecast Center. "Unless you have well-developed route-finding skills and avalanche skills you should maybe be thinking about riding the resorts this weekend."

Friday's morning advisory from the Utah Avalanche Forecast Center ranked the danger along the Wasatch as considerable on slopes approaching 35 degrees or steeper with deposits of wind-drifted snow and in shady areas.

The forecast said the danger would probably rise to high, the second-highest rating on the avalanche danger scale, on Easter weekend.

"We should have a strong warming with sun this weekend and this will almost certainly create widespread areas of wet avalanches with dramatically rising avalanche danger. You definitely need to stay off of and out from underneath steep slopes, especially when they get wet and soggy," Friday's report stated.

At the first avalanche site, Bruce Meisenheimer, 45, of Draper, suffered cuts on his head and bruising on his neck, a dislocated finger and a minor tear in the ligament in his knee. Graham Stork, 54, suffered chest and neck injuries. Rick Hoffman, 55, had chest injuries.

According to Meisenheimer's son Trent and cousin Aaron Keay, the men were hiking to Argenta Peak.

Meisenheimer was buried waste deep in the avalanche but was close enough to reach a shovel and dig himself out. The other men did the same.

The trio was able to find a pair of skis in the slide and Meisenheimer was able to ski down and call 911 by cell phone. He was later transported to LDS Hospital.

Searchers didn't know the exact location of Hoffman and Stork until two other backcountry skiers found them and called 911.

The three hikers on Mount Olympus — Derrick Doman and Jason Livingston, both 34, and 27-year-old Steve McGrath — were not injured. The trio was scouting out a camp area for the night when the slide began.

"They were kind of in the debris field," Sommers said. "They weren't at the top."

Sommers said two of the men were buried near each other and were able to dig their way out. The third man was swept about 80 yards away.

"Snow was over his head," Sommers said.

A small pocket of air allowed the buried man to breath while his friends dug him out.

Sommers said the three men were in a popular area for snowshoeing and had hiked there before.

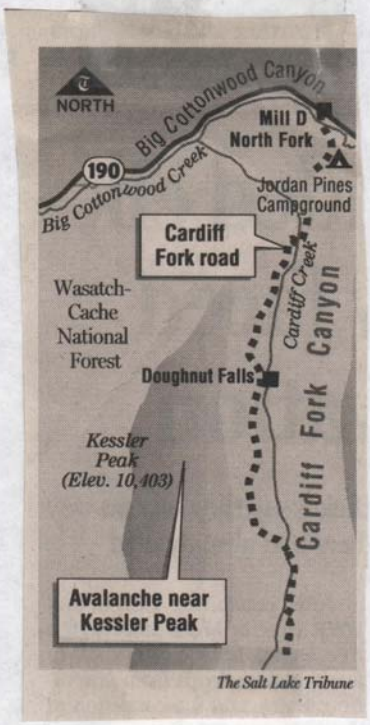
Two of them had even undergone some avalanche training and had checked the avalanche forecast conditions in the area before heading out. They also carried shovels but not locator beacons.

"All three walked out under their own power," Sommers said.

Because there were no other signs of footprints in the area of the avalanche, and only the car driven by the snowshoers was parked on Thousand Oaks Circle, authorities don't believe anyone else was buried in the Mount Olympus slide, Sommers said.

Avalanches have killed seven people in Utah this winter.

For avalanche advisories visit **http://www.utah avalanche center.com** or call the hot line at 801-364-1581.

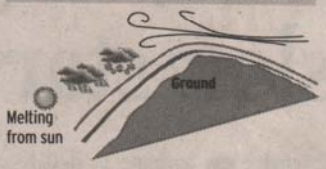


How avalanches happen

SLAB AND WEAK UNDERLYING LAYER

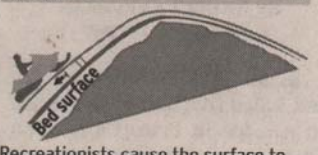
A fresh layer of snow on top of pre-existing weak layer(s).

RAPID CHANGE TO THE SNOWPACK



High winds and fluctuating temperatures make conditions worse.

A TRIGGER



Recreationists cause the surface to slide, triggering the avalanche.

The Salt Lake Tribune

The Salt Lake Tribune
UTAH

Spring avalanches trap six

Skiers, hikers survive backcountry slides

By Justin Hill
Jason Bergreen
and Brett Prettyman
The Salt Lake Tribune

Six people were able to escape from two separate avalanches that cascaded Friday down the mountains above Salt Lake County.

The first avalanche, which came down about 3:15 p.m. near Kessler Peak in Big Cottonwood Canyon, injured three friends backcountry skiing. Rescue crews worked late into Friday night bringing the victims down from the mountain.

The second avalanche occurred on Mount Olympus several thousand yards above Thousand Oaks Circle.

Three snowshoers, believed to be from the Salt Lake City area, were smothered by a 200-yard-long slide, Salt Lake County sheriff's Lt. Teri Sommers said. Emergency crews were notified of the slide at 4:55 p.m. when one of the three victims called 911 to report the avalanche and say they were OK.

Even though the six survived Friday's avalanches, a Salt Lake County sheriff's deputy had a simple suggestion for backcountry skiers: Do not come up to the mountains.

"It's going to be dangerous all weekend long," said sheriff's Sgt. Mike Morgan. "All of these mountains are dangerous."

Avalanche threats will be especially high on south-facing slopes today and include all slopes by Sunday, said Bruce Tremper, the

See **SLIDES**, B4

Danny Chan La/*The Salt Lake Tribune*

Rescuers bring an avalanche victim to a waiting ambulance Friday night in Big Cottonwood Canyon. The victim's two companions were also rescued.

More death on the slopes

Lost hiker's body found; second is presumed dead

By Jason Bergreen
The Salt Lake Tribune

BIG COTTONWOOD CANYON — Friends and family were optimistic Bruce Quint would be found alive until searchers Sunday recovered the body of his hiking partner from an avalanche site in Big Cottonwood Canyon.

Quint and Melvin Denis were reported missing Saturday evening when they failed to return from snowshoeing near Mineral Fork.

The body of Denis, a 32-year-old University of Utah medical student, was found about 11:30 a.m. Sunday by a search and rescue dog. He was buried in 3 to 5 feet of snow, where helicopter searchers had spotted snowshoe tracks the day before.

A search and rescue crew looking for avalanche victims is dropped off by helicopter near the command center in Big Cottonwood Canyon on Sunday.

Denis' girlfriend, Alison Schiffern, and members of Quint's family hugged and comforted one another near the side of the mountain Sunday where searchers had set up a command post. The news of Denis' death put a damper on any hope of finding Quint alive.

"I think he's been lost," Quint family friend Drew Hall said. "We're all pretty realistic about what's happened. We were optimistic until they found Mel's body."

Quint's brother-in-law Norman Le Fevre echoed Hall.

"We've lost two wonderful people," Le Fevre said. "I assume we've lost Bruce."

Saturday's avalanche

See **AVALANCHE**, A6

Avalanche claims hikers

• Continued from A1

occurred at an altitude of about 9,400 feet. It was about 3½ miles from the nearest road and was about 300 feet wide, Salt Lake County sheriff's Sgt. Rosie Rivera said.

Bruce Quint

The conditions in the Wasatch Mountains have made the area prone to avalanches, and Denis' death was the third confirmed avalanche death in Utah since Friday.

The area was so dangerous rescuers ignited 45 explosions to trigger potential avalanches before beginning the main search about 10:45 a.m. Sunday morning, Rivera said.

Denis and Quint were training Saturday for a May hike up Shisma Pangma, a 26,000-foot mountain in the Himalayas, when the avalanche fell. They did not have avalanche beacons.

Quint was the executive director of Community Development Corp. of Utah, which builds homes in Salt Lake City for low-income families, Hall said.

"He was very outgoing, tough, adventurous and hard-charging," he said.

About 20 members of Wasatch Backcountry Rescue and six dogs participated in Saturday's search. Three helicopters, two from local ski resorts and one from the Utah Highway Patrol, ferried the men and dogs to the avalanche area.

DANNY CHAN LA/*The Salt Lake Tribune*

Terri Quint, wife of avalanche victim Bruce Quint, thanks searchers Chad Jaques, left, and Roy Mullen and search dog Deuce on Sunday. Her husband has not been found.

Terri Quint, Bruce's wife of 12 years, managed a smile and held back tears as she patted search dogs and thanked rescuers returning around 4 p.m. from the avalanche site. Her husband's probable death had not sunk in.

"I'm still numb," she said. "This isn't real. I want to say 'OK, Bruce, time to come down.' "

The Quints were close friends of Denis' and considered him a family member.

Born in Cuba, Denis moved to Florida with his parents at a young age, Terri Quint said. She knows because she was Denis' English teacher at Coral Gables High School in Miami.

"He was a terrific guy," she said. "He was like a son to my husband."

Terri Quint lost track of Denis in 1992 after moving with Bruce to Salt Lake County, where the couple were married.

In a twist of fate, the Quints were watching a football game between the Miami Dolphins and the Buffalo Bills last season at The Fiddler's Elbow and ran into Denis. He was living in Salt

Below, Alison Schiffern, right, the girlfriend of avalanche victim Melvin Denis, is consoled after learning that his body was found.

PHOTOS BY DANNY CHAN LA/*The Salt Lake Tribune*

Lake City and attending the University of Utah, where he was working on his Ph.D. in vascular medicine.

"I said, 'Oh my goodness, you were one of my students,' and we just hugged," Terri Quint remembers.

From then on, Bruce Quint and Denis, who both loved the outdoors, began spending a lot of time together.

"They were both big talkers, readers and thinkers," Terri Quint said.

Bruce had a Ph.D. in psychology and would have turned 60 in January.

"Bruce wanted to leave a legacy. Everybody who knew him said he would have wanted to go this way instead of in a nursing home. This was a little too soon," she said holding back tears.

Denis had no family in Utah, Terri Quint said. His mother lives in Florida.

Denis' girlfriend, Schiffern, is devastated, Terri Quint said.

Denis was only six months from receiving his Ph.D. and was planning to move into a new house next week, Terri Quint said. He was scheduled to become a U.S. citizen on Wednesday.

Rescues crews will resume their search for Quint today, Rivera said.

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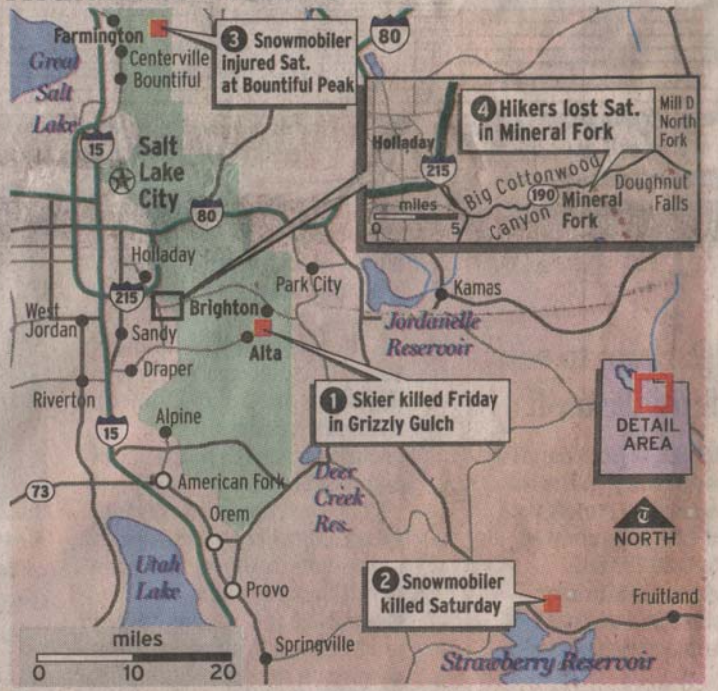
Avalanche victims



1 Zachary Eastman, 22, of Salt Lake County, died Friday night after triggering an avalanche in Big Cottonwood canyon while skiing on a backcountry slope.

2 A 42-year-old man died in an avalanche Saturday morning while snowmobiling in the Trout Creek area of Wasatch County. The man, whose name had not been released Sunday night, was found under 4 feet of snow.

3 Ben DeJong, 27, of Bountiful, was buried in an avalanche while snowmobiling in the Farmington Flats area of Farmington Canyon Saturday afternoon. He was rescued by a friend and released from the hospital later that day with minor bumps and bruises.

4 Snowshoer Melvin Denis, 32, of Salt Lake City and friend Bruce Quint, 59, of Salt Lake County, were reported missing around 5 p.m. Saturday. Denis' body was found in an avalanche in Big Cottonwood Canyon Sunday. Quint's body had not been found as of Sunday.

The Salt Lake Tribune

Avalanche claims skier in Big Cottonwood Canyon

By Lisa Rosetta
The Salt Lake Tribune

An avalanche in Big Cottonwood Canyon minutes before 5 p.m. Friday killed a backcountry skier, the first avalanche death in Utah this winter.

The victim and a friend were skiing in Grizzly Gulch in the Twin Lakes Pass area when the slide began, burying one man in 2 to 3 feet of snow, said Salt Lake County sheriff's Lt. Robert Sampson. Both skiers were wearing avalanche beacons; it took the other man about five minutes to find his friend. He dug him out and called 911 on his cell phone.

"[The victim] wasn't breathing on his own," Sampson said.

The victim's friend and Solitude ski patrollers administered CPR until a helicopter landed in the upper

See **AVALANCHE**, B2

Avalanche kills backcountry skier in Cottonwood canyon

● Continued from B1

parking area of the Solitude ski resort at about 6:20 p.m. The victim, 23, of Salt Lake County, was taken to LDS Hospital, where he was pronounced dead at 6:52 p.m.

It was unclear Friday evening what caused the avalanche, or how far the victim was carried by it, Sampson said.

Friday morning, the Forest Service Utah Avalanche Center issued an avalanche warning for the northern Utah mountains and extreme southeast Idaho through midnight. Recent snow, strong winds and rapidly warming temperatures contributed to high avalanche danger, with avalanches occurring at unusually low elevations, according to the Forest Service's Web site.

"We've received a tremendous amount of snow and it's added a lot of weight to some very weak layers within the snowpack," said Craig Gordon, an avalanche forecaster for the Salt Lake City-based Avalanche Center. Add to the mix high winds, which create slabs, and "it's a great combination for increasing avalanches in the backcountry," he said.

"People without well-developed avalanche skills may want to think about skiing in the ski resorts," he said.

The fatal slide happened about two miles south of Solitude resort.

A resort employee confirmed the avalanche and directed the quick-response members of the ski patrol to the site. About 10 ski patrollers from Solitude used snowmobiles or skis to reach the site, said Marvin Sumner, director of the Solitude Ski Patrol.

About 10,000 avalanches occur each winter in Utah, and of these, people unintentionally trigger about 100. About 20 people get caught in the slides, on average, and four people die each year, according to the Avalanche Center's Web site.

Last year, three snowboarders were killed in a massive slide the day after Christmas in Provo Canyon. A fourth person, a snowshoer, was killed two months later in Daly Canyon near Park City.

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Salt Lake Tribune reporter Jason Bergreen contributed to this report.

Avalanche kills snowmobiler

Utah slide toll deadliest in 50 years

By Lisa Rosetta
The Salt Lake Tribune

An avalanche in northern Utah killed a 27-year-old snowmobiler Thursday — the eighth person to perish in a slide this season.

The man, whose name was not released, was snowmobiling with four or five other people in the South Arbs Basin near Eccles Peak, about 30 miles northeast of Ogden, when the slide occurred just before 11 a.m.

It took nearly an hour for Rich County Sheriff's Office rescuers to reach the man, who was wearing a beacon and was dug out by fellow snowmobilers about seven minutes after the slide.

Sheriff Dale Stacey said the man was slammed against a tree and may have died as a result of the impact.

The South Arbs Basin avalanche was just one of many Thursday. Two others broke loose near the Brighton Ski Resort, but no one was injured. A backcountry skier called to report an avalanche at Wolverine Cirque, just out of bounds south and west of Brighton, about 4:30 p.m.

Brighton Ski Patrol and the Salt Lake County Sheriff's Office Search and Rescue searched the area, and nobody was believed to have been caught up in the slide, said Salt Lake County sheriff's Sgt. Todd Griffiths.

There were multiple avalanches in the mountains Thursday — natural as well as slides triggered by avalanche control and skiers, Griffiths

See **AVALANCHES,** B3

Avalanches

● Continued from **B1**

said.

The 2004-2005 snow season is the deadliest on record in more than 50 years, underscoring the importance of checking avalanche conditions before heading out into the backwoods, said Craig Gordon, a U.S. Forest Service Utah Avalanche Center forecaster,

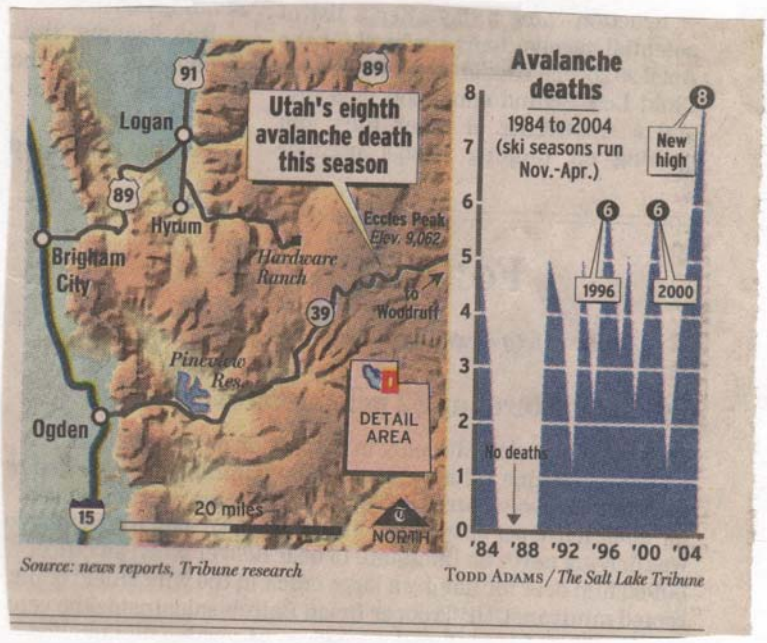
"It's an unflattering statistic," he said.

Heavy snowpack — 164.5 inches fell in the upper Little Cottonwood Canyon over the past two weeks — and rapidly rising temperatures are to blame for the slides.

Warm weekend weather may cause the snow pack to be "cranky," making more avalanches inevitable, the forecaster said.

"If you don't have well-developed avalanche skills, maybe it's a weekend to hang out on the ski hills," he said.

For up-to-date avalanche information, visit **http://www.utahavalanchecenter.com.**



Source: news reports, Tribune research

Todd Adams / *The Salt Lake Tribune*

The New York Times
ON THE WEB

NATIONAL DESK | January 19, 2005, Wednesday

Skiers Risk Answering the C

By KIRK JOHNSON (NY
Late Edition - Final

1/17/05

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The Dallas Morning News DallasNews.com

NATION

5 feared dead in Utah avalanche

Sheriff exasperated at skiers who ignored warnings of snowslides

From Wire Reports

PARK CITY, Uta
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thing, but it turned out to be an elk.
Officials were holding out little hope that anyone would be found alive in the vast volume of snow.
"With the weight and depth, there is just no way," Sheriff Edmunds said. "Over 30 feet. The conditions are horrific."
The avalanche broke near a ridline just south of the ski resort's
aries with enough force to
14 inches in diameter.
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Associated Press

Danger remained high for more avalanches as searchers Saturday unsuccessfully dug for victims in more than 30 feet of wet, heavy snow. Five skiers disappeared near the Canyons, a resort on national forest land in Utah's Wasatch Range. By nightfall, the only thing searchers had found was an elk.

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NATION

Utah avalanche traps at least 3 near resort

By Doug Alden
Associated Press

PARK CITY, Utah — An avalanche outside a Utah ski resort on Friday trapped at least three people beneath as much as 30 feet of snow, authorities said.

Summit County Sheriff Dave Edmunds said he did not know precisely how many people were missing in the slide but said he was "willing to say more than two." He did not know if victims were wearing avalanche beacons, which would transmit their locations, even under the snow.

No bodies had been recovered, and no survivors have been found in the avalanche, which was about 500 yards wide and happened outside the boundary of the Canyons resort on federal land in the Wasatch-Cache National Forest.

More than three hours af
the avalanche, Edmu
was nearing
focu

Douglas C. Pizac/Associated Press

The fracture line of an avalanche lies across a mountainside, where at least three skiers were trapped Friday.

country but stayed away from the popular Dutch Draw area Friday near where the slide took place.

"I looked at that ride probably 20 or 30 minutes before it went, and what immediat
came to mind is that
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were not sure how many people might be in the slide but said that through binocul
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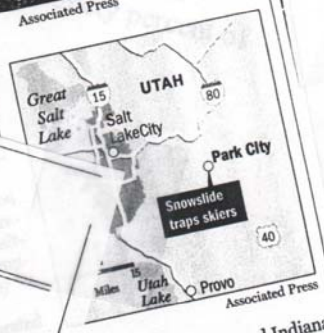

Associated Press

Governors of Ohio and Indiana declared emergencies in flood areas earlier in the week, and on Friday, Indiana Gov. Mitch Daniels asked President Bush to declare at least 64 counties a major federal disaster area.

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the

AVALANCHES

Taking Precaution

AVALANCHES IN Utah have caused seven deaths this winter, the most since the state began keeping records in 1951. And as the death toll mounts, avalanche safety courses for backcountry skiers and snow-boarders are prolifera... They can take di... ty classes at ... where ... Ir... ...s "maxed ...ctor Knox V...s. In general, students learn about slope stability, search-and-rescue techniques and lifesaving medical skills. Companies that sell safety gear are profiting, too. Ortovo sales of probes, shovels and other gear has grown 7.5 pe... cent annually for five years. Despite the education an... technology, there's still t... "myth that people can d... themselves out," says P... Metcalf, founder of saf... company Black Diamon... "It's nonsense." -PAUL TOLME

Newsweek

Tips from the Utah Avalanche Center's 'Know Before You Go' safety program

- Most avalanches are triggered by the victi... victim's party. Avoid slopes without ... than about 30 degrees. Slo... are most dange...
- Be a... ...ng or collapsing ...w or sinking into wet ...
- ...anche weather," including recent strong winds, ... or prolonged snowpack melting.
- ...tentially dangers slope, expose only one ... maining party waits in a safe place to ...
- ...s and work up to larger, more dangerous ... ormation about snow stability.
- ... backcountry, call the avalanche hot line ... re available at ...e.org) or visit the Web site.
- ...escue beacon, shovel and probe and ...
- ... by the time a rescue team arrives, it will ... to save a life.

Avalanche survivors beaten up,

...conditions

... have experienced one ...nd where four individuals ...n to avalanches. It seems that ...ave a handful every year. I imag-...e, at the very least, that most moun-tain enthusiasts are watching weather on one of the three local television sta-tions the night before they head up into the mountains.

Utah already has a very capable av-alanche reporting program in place. Unfortunately, that organization only reports conditions on our local radio stations. I wonder how many lives we could save if, each night, the local tele-vision stations reported the most up-to-date avalanche conditions as deter-mined by the Utah Avalanche Center. It seems to me that the 30 seconds it would take to describe current conditions could possibly save a number of liv...

Avalanche accidents – the statistics

- Avalanches kill more people in Utah than any other natural hazard.
- Avalanche accidents rarely occur within ski areas or above highways, because ava-lanche workers routinely control avalanche hazard on such slopes with explosives.
- 99.9 percent of avalanche accidents occur in the backcountry – the bowls, peaks, and slopes outside ski areas, where there is no avalanche control.
- ... their own carbon diox-... ...ing trees or rocks on ... ...pothermia.
- ...e first 25 minutes; 95 ...
- ...re very skilled at their ... far behind their sport ...
- ...han any other group ... can go, but they can ... ny instabilities exist, ...
- ... avalanche advisory ...

Why so much danger? And why now?

By Tom Wharton
The Salt Lake Tribune

Bruce Tremper, the director of the Utah Av-alanche Forecast Center, says he has seen a few avalanche scenarios as dangerous as the one that occurred this weekend.

But not many.

"What a cycle," he said late Sunday.

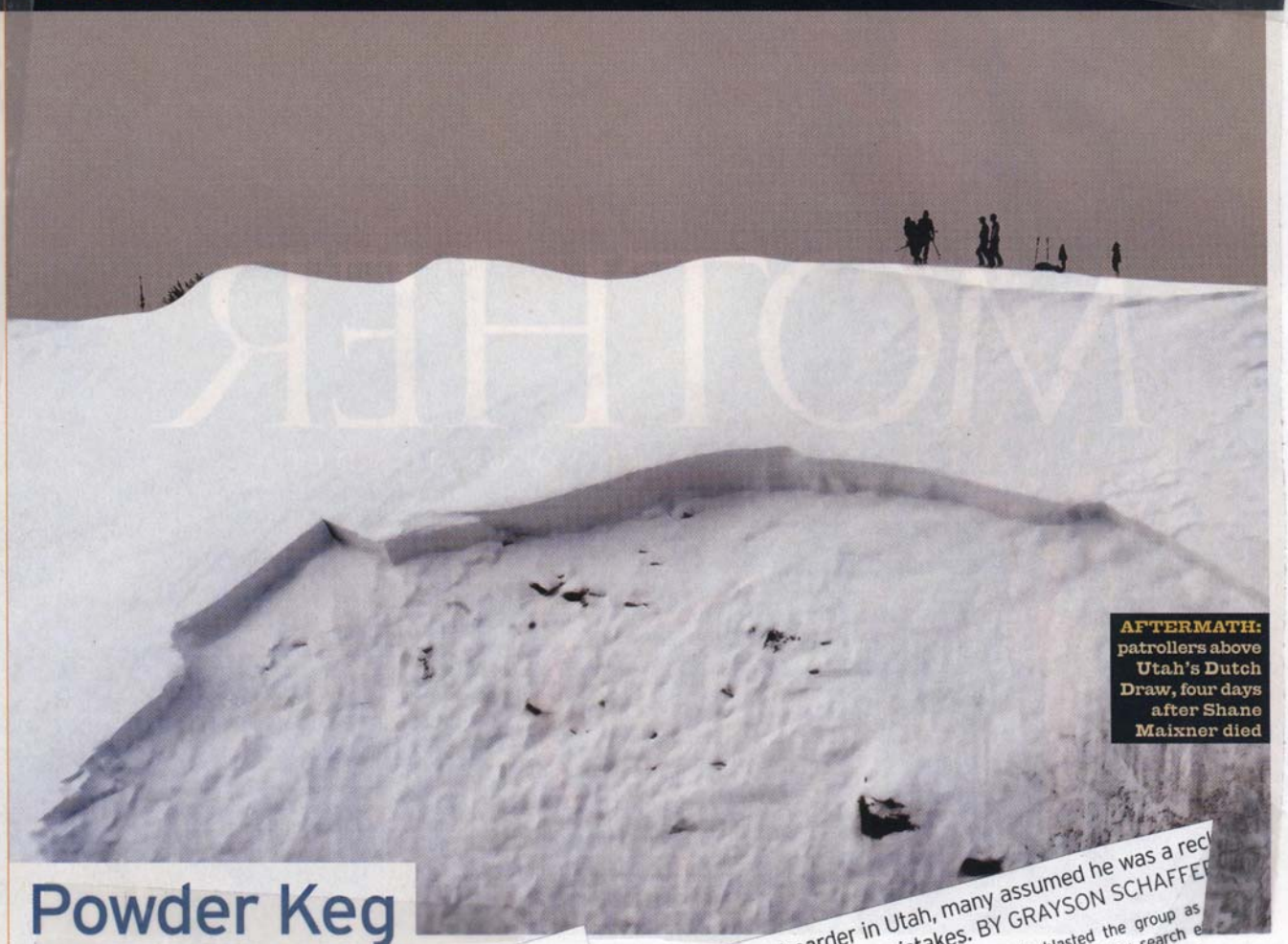
Three people have died in avalanches in the Wasatch Mountains since Friday, and a fourth is missing and presumed dead.

While only one backcountry enthusiast was killed in an avalanche in Utah during the 2002-2003 season, four people lost their lives last season — a toll apparently equaled over the weekend.

And a good four months remain in the ava-lanche season.

Recent snow, strong winds and rapidly ris-ing temperatures contributed to high ava-lanche danger, with avalanches occurring at unusually low elevations, according to the Forest Service Utah Avalanche Center, which issued a warning Friday.

See DANGER, A6



AFTERMATH: patrollers above Utah's Dutch Draw, four days after Shane Maixner died

Powder Keg

Powder Keg

When an avalanche killed an out-of-bounds snowboarder in Utah, many assumed he was a rec
novice. The scary truth? Experts make most of the lethal mistakes. BY GRAYSON SCHAFFE

"THERE WERE PROBABLY 70 or 80 tracks right in here," says 26-year-old Erin Brannigan, diagramming in my notebook the massive avalanche that five days ago killed his best friend, Shane Maixner, 27, just outside the Canyons ski resort, near Park City, Utah. "You could see them from the chairlift. Everyone was skiing it."

I've known Brannigan since we went to the same elementary school in Sandpoint, Idaho, and I met Maixner in 2002. We're back in Sandpoint to attend Maixner's memorial, and I'm getting the unreported story behind the slide. Between noon and 1 P.M. on Friday, January 14, Brannigan, Maixner, Kalem Lenard, Scott Karli, and Stacie Kunkel got off the Canyons' Ninety-Nine 90 lift, hiked 150 yards up to the backcountry gate, and headed into Dutch Draw for the [illegible] that day. The draw's two winglike bowls—which aren't monitored or [illegible]arch into a central spine and then taper back inbounds. They cut fresh tr[illegible] which they'd carved up an hour and a half ear[illegible] the west bowl, taking in views and around it to scout the landing[illegible]ffered a safer descent.

"He hit his little cliff air and started [illegible] cliff. Brannigan skirted S-curves from the spine into the west bowl. As Br[illegible]nigan began to follow, he heard Kunkel yell, "Avalanche!" Turning upslope, he saw the mountainside washing down behind a 60-foot-high debris cloud. He arced over the spine, just dodging the slide. Below was Maixner, fists pumped, head down, racing for his life toward a stand of 60-year-old spruce trees. The wave overtook him, shattering the trees. "It snapped him in half," says Brannigan.

Media reports blasted the group as [illegible] even before a 250-volunteer search e[illegible] Maixner's body on Sunday. The skull-and[illegible] sign at the backcountry gate and the r[illegible] safety equipment made them easy t[illegible] lowing Wednesday, *The New York Ti*[illegible] front-page story quoting experien[illegible] skiers who look with "barely con[illegible] reckless out-of-bounds riders lik[illegible]

The only ones who remained [illegible] vivors, refusing interviews. "R[illegible] the story," says Brannigan, e[illegible] of Lenard, Karli, and Kunkel. [illegible] News reports assumed M[illegible] didn't understand the dan[illegible] I knew otherwise. Maixne[illegible] backcountry guide with[illegible] Powder Company. Tw[illegible] Karli and Kunkel, we[illegible] they all owned hom[illegible] But since they w[illegible] resort runs that r[illegible]

The decision [illegible] mistake. All of [illegible]

Outside APRIL 2005 VOLUME XXX NUMBER 4 WWW.OUTSIDEONLINE.COM

Executive Ride Jan. 28 & 29!

UTAH SNOW SCOOP

Safety Week Jan 9 thru 15!

VOLUME 13 • ISSUE 4 | The Official Publication of the Utah Snowmobile Association-USA | JANUARY, 2005

Governor Declares Snowmobile Safety Week Jan. 9-15

Education and Avalanche Safety Main Focus During Safety Week

By: Utah State Parks

Governor Olene S. Walker declared Snowmobile Safety Week January 9 to 15. For this seven-day observance, and throughout Utah's snowmobile season, Off-Highway Vehicle (OHV) Education Specialist Eric Stucki is stressing education and avalanche safety.

"This year we urge snowmobilers to be especially aware of the avalanche danger and to use our hotline to get updated avalanche information," said Stucki. "The OHV hotline offers current avalanche and snow conditions. In addition, it offers grooming information for all snowmobiling complexes maintained by Utah State Parks and Recreation. Snowmobilers may also get avalanche information online at www.avalanche.org."

Riders may access the hotline 24 hours each day by calling the OHV Information Center at 1-800-OHV-RIDE. The hotline also provides information about snowmobiling laws and rules, survival tips, OHV education, and maps.

Stucki also urges parents to enroll their children in a Know Before You Go! Snowmobile education class now. Young drivers eight through 16 years old must possess an OHV Education Snowmobile Certificate issued through Utah State Parks or valid driver's license while operating a snowmobile on any public land, road or trail. Classes are available now and continue each week throughout the riding season.

Also, in recognition of Snowmobile Safety Week, Stucki provides the following safety tips:

• Never Ride Alone: Always ride with a companion and let others know where you are going and when you expect to return.

• Ride Within Your Skill and Experience Level: know your capabilities and limitations.

• Fuel: watch your fuel supply carefully.

• Helmets: Always wear an approved helmet designed for motorized use. All snowmobile operators and passengers under 18 are required to wear properly fitted and fastened helmets, with a Department of Transportation (DOT) Approved safety rating for motorized use.

• Be Prepared: Always carry a survival kit containing a map of the area riding in, compass, flashlight, extra food, extra clothing, sunglasses, first aid kit, pocketknife, waterproof matches, and candles or fire starters.

Featured in the photo above: Craig Gordon (Avalanche Forecast Center), Ken Rossum (President Elect/Utah Snowmobile Association), Tiffany Maw (Off Highway Vehicle Education Office), Eric Stucki (Utah OHV Education Coordinator), Governor Walker, Ty Hunter (Utah State Park and Recreation), Mike Eggett (OHV Youth Education Instructor).