

# 2009-2010 Annual Report



## Gallatin National Forest AVALANCHE CENTER

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## Acknowledgements

**FRIENDS OF THE AVALANCHE CENTER  
BRIDGER BOWL  
TEAM BOZEMAN  
MONTANA FISH, WILDLIFE AND PARKS  
FRIENDS and FAMILY of TYLER STETSON**

**Jeff King at Edward Jones Investments  
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95.1 KMMS  
Pinhead Classic  
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Community Food Co-Op  
On Site Management  
The Dance Center  
Bountiful Table  
K2 Deli and Cafe  
Big Sky Ski Patrol  
Danhof Chevrolet  
Moonlight Basin Ski Patrol  
Gallatin Valley Snowmobile Association  
NRCS  
National Weather Service-Billings  
Montana Fish Company  
Cold Smoke Awards**

*Cover: A very happy snowmobiler give a thumbs-up moments after his partners dug him out of a small avalanche. By far, this is the best photo I've ever seen of someone seconds after getting dug out. Usually these situations are grim, but not this day. Everyone had rescue gear, were riding one at a time in avalanche terrain, and had taken our avalanche classes. They turned a potentially bad event into a celebration. Photographer and rider wish to remain anonymous.*

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## From the Director: Our 20th Year of Operation



Greetings!

We just finished our 20<sup>th</sup> year of operation at the Gallatin National Forest Avalanche Center (GNFAC). Mark Staples, Eric Knoff and I had a great, safe season. We owe thanks to all our supporters in the community, co-workers on Gallatin National Forest, and Friends of the Avalanche Center . We could not have succeeded without your help.

The starter pistol of the avalanche season rang out on October 6<sup>th</sup> when a skier triggered a slide in the Bridger Range. We were fortunate to get early season snow in October and November, but below zero temperatures in December turned much of the snowpack into weak, faceted depth hoar. This layer avalanched all season. We began daily avalanche advisories on December 5<sup>th</sup> and continued until April 11<sup>th</sup> for a total of 127 posts. Unstable snow created avalanche activity and/or widespread collapsing and cracking on 83 (65%) of those days. *It was the most active avalanche season in our history.* We even had slides on Peet's Hill and the Moonlight Basin golf course. The instability was unprecedented and we didn't issue a LOW danger rating the entire winter. Unfortunately, we did not escape unscathed. An ice climber died in an avalanche in Hyalite drainage in December, a snowmobiler was buried and killed outside Cooke City in early January and another snowmobiler died in April near Buck Ridge. Unstable conditions coupled with more people in the backcountry meant there were more folks triggering slides than ever before. There were a record 87 avalanche incidents, almost double our average, with 21 people caught, 9 partial burials, and 3 full burials. Only luck kept many of these from ending up as fatalities. In one instance, Eric Knoff was digging a snowpit and watched a skier trigger and get buried in a slide. He and his partners did a text-book rescue.

Season Highlights:

- ◆ The Avalanche Center saw a 9% increase in the number of people getting the daily advisories. On average 3,534 people a day read or heard the advisory.
- ◆ Partnered with the Friends we taught 64 classes reaching over 4,900 students.
- ◆ We brought in guest lecturers from Wyoming and Glacier Country for a Wet Snow Work-

shop for avalanche professionals (ski areas, MSU, forecasters).

- ◆ Our sidecountry movie *Stay Alive*, was reedited and distributed to a national audience.
- ◆ Our new website allowed us easier ways to give the public avalanche information. The *Advisory* page had embedded photos and videos, our new *Sidecountry* page had information on accessing the backcountry through ski areas, the new *Accidents* page listed our reports/photos in a database, and the *Donate* button allowed people to make contributions to the Friends.
- ◆ The GNFAC entered the world of social networking. The Friends' Facebook page currently has 1,184 fans and our Twitter page has 292 followers. These were valuable new tools in keeping backcountry users abreast of changing conditions and education opportunities.
- ◆ This season we made 37 YouTube videos that were watched over 77,515 times; 3 times the views as last year.
- ◆ The Friends partnered with Team Bozeman and Yamaha to loan us two, 2010 MTX Nytro 4-stroke snowmobiles. We rode over 1,280 miles on each one which allowed us to reach popular riding areas, investigate countless avalanches and access areas too distant to ski.
- ◆ A large, human triggered avalanche on Saddle Peak outside Bridger Bowl on February 16<sup>th</sup> narrowly missed killing many sidecountry skiers and boarders. We used this incident to dispel many myths about backcountry skiing and talk about history of the snowpack in this area. Our education efforts culminated in a lecture and Q&A session at the Bozeman Public Library attended by over 225 people. This hour long lecture/discussion is posted on YouTube and was viewed an additional 900 times.

Besides funding from the Gallatin National Forest, we rely on other sources too. We get substantial financing through the Montana FW&P Recreation Trails Program and Friends of the Avalanche Center. We're also fortunate to be supported by local community businesses and organizations that each donate many thousands of dollars: Team Bozeman, Northern Lights Trading Company, Bridger Bowl, the Hans Saari Memorial Fund, Gallatin County Search and Rescue, Yellowstone Club Community Foundation, and Montana Ale Works. This year the friends and family of Tyler Stetson, a young man who was killed in an avalanche in Beehive Basin in 2008, raised over \$15,000 for the Friends through pledges at the King and Queen of the Ridge.

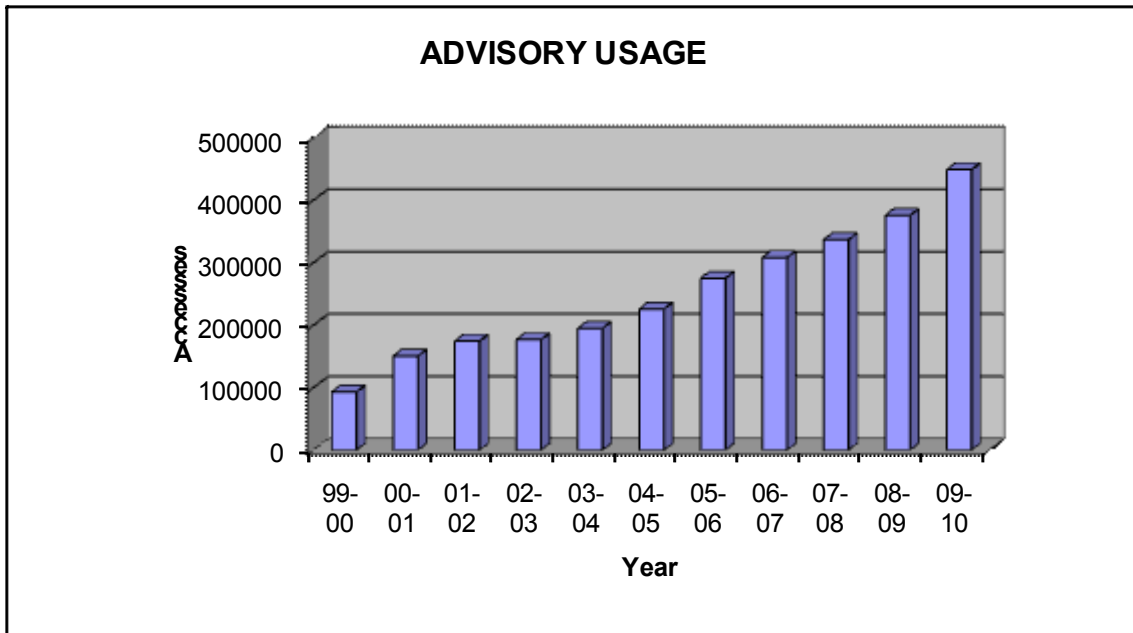
To everyone who has gotten the daily advisory, taken a class from us, made a donation or sent in an observation---Thank You. It's an honor to work for you.

Respectfully,

Doug Chabot

## Avalanche Advisories

This winter over 3,534 people a day got our daily avalanche advisories. This is a 9% increase from last year. We emailed our post to 2,440 people/day which was on top of the 950 daily, unique hits to the *Advisory* web page. Another 150 accesses were reached through faxes and phone calls to our hotline.



YouTube videos have become a staple in our advisories. Using a cheap point and shoot camera we routinely make 1-2 minute videos of snow conditions. This visual aide compliments the information in our advisories. This season we posted 37 videos that were watched over 77,515 times, **triple** the views last year.



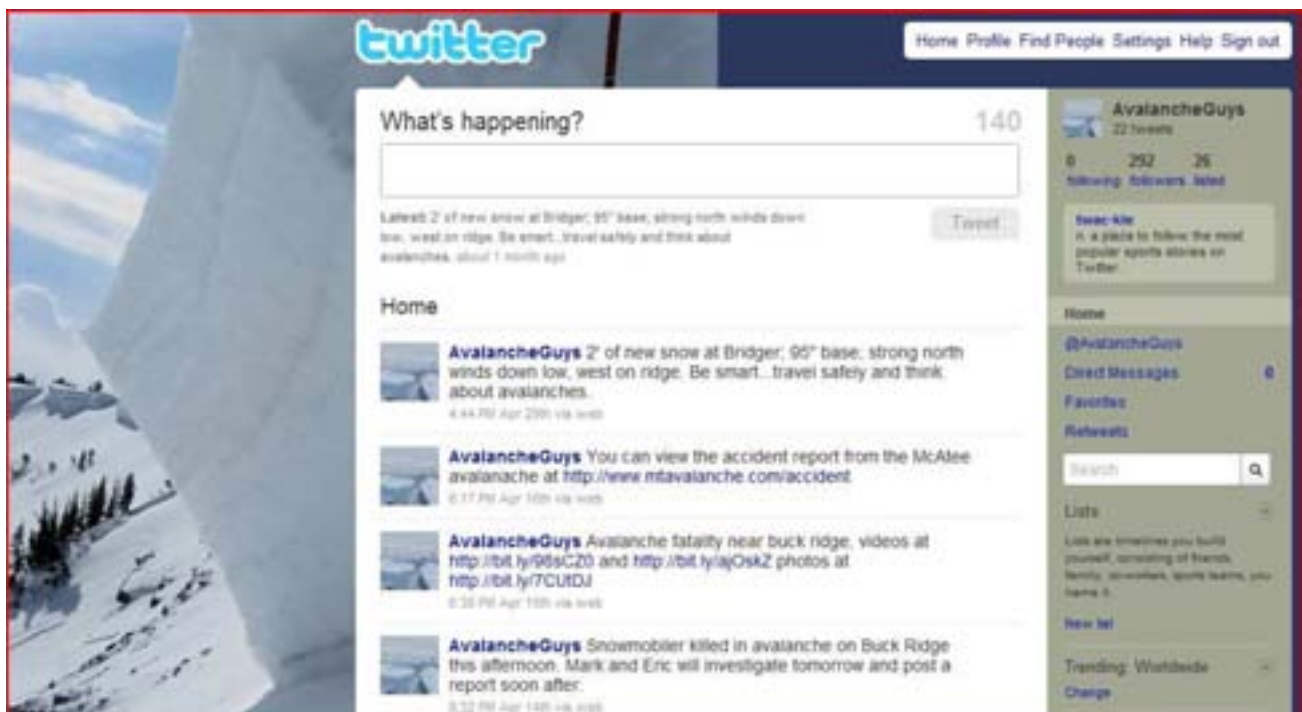
**Buck Ridge Stability Test - 14 Feb 2010**  
Eric Knoff of the Gallatin National forest Avalanche Center gets clean fractures in his stability tests.  
Added: February 14, 2010, 03:29 PM Views: 931  
Time: 0:44 Comments: 1  
Raw File: Buck Stability.wmv Responses: 0  
Broadcast: Public

facebook & twitter



This season the Friends and GNFAC started social networking through Facebook and Twitter. We were able to expand our reach into the community using these popular networks.

The Facebook page has 1,184 Fans while Twitter has 289 followers. We posted 22 tweets this season, usually in the afternoons to give folks a heads up about changing conditions or avalanche activity before the next mornings advisory.



## New Website Design: [www.mtavalanche.com](http://www.mtavalanche.com)



Last fall we had Jim Earl redesign, configure and update our website. Our old site worked, but it was created in 1999 and was becoming an administrative mess since we were using brute force to update our pages. Jim converted everything to a user friendly platform that allowed us to add new pages, links, archives, photos and videos. Its most useful feature was the ability to embed pictures and videos onto our *Advisory* page. This made it easier to get the information you were looking for without having to click elsewhere.

A new *Sidecountry* page became quite popular after the avalanche on Saddle Peak. We posted all relevant photos, videos, articles and other media to this central location. The new design also allowed us to archive photos, videos, avalanche accidents and articles.





## Avalanche Education

Avalanche education has always been a primary focus of the GNFA. Together with the Friends of the Avalanche Center we taught 64 classes reaching 4,900 students. Jay Pape, the Friends education coordinator, continues to be instrumental in growing this program every year.

<b>Date</b>	<b>Group/Topic</b>	<b>#</b>
8/22/2009	Thunderstruck #8 Premier, Helena	250
10/3/2009	Thunderstruck #8 Premier, Lewistown	200
10/25/2009	National Avalanche School/Avalanches	150
10/26/2009	NAS/Terrain	150
11/5/2009	Chief Joseph Middle School x 2 periods/ Ava Awareness	200
11/11/2009	Sleeping Giant Middle School x 7 periods/Ava Awareness	175
11/12/2009	The Basecamp, Helena/Ava Awareness	42
11/17/2009	NWS - Great Falls/Ava Awareness	12
11/18/2009	Great Falls NWS/Ava Awareness	15
11/19/2009	The Basecamp, Billings/Ava Awareness	76
11/19/2009	Northern Lights Trading Company/Ava Awareness	58
11/19/2009	Boz chamber of Commerce/Ava Awareness	40
11/22/2009	GCSAR/Last Season's Accidents	25
12/2/2009	ASMSU/Friends Basic, Lecture 1	290
12/3/2009	ASMSU/Friends Basic, Lecture 1	285
12/3/2009	Team Bozeman/Snowmobile Class (12hr)	22
12/4/2009	Team Bozeman/Snowmobile Class (12hr)	22
12/5/2009	ASMSU/Friends Basic, Field Sessino @ BBowl	185
12/9/2009	Redline Sports, Avy Awareness	32
12/12/2009	Great Falls/ Ava Awareness	75
12/13/2009	Team Bozeman/ Field Session	20
12/15/2009	Cooke City SAR, Awareness	38
12/15/2009	MOSS, Bozeman Library, Awareness	50
12/16/2009	Cooke City SAR, Field	22
12/16/2009	Belgrade Middle School, 7th Grade Awareness	520
12/17/2009	Vail Doctors/Ava Awareness	31
12/17/2009	West Yellowstone Snowmobile Class (lecture)	34
12/18/2009	West Yellowstone Snowmobile (field)	27
1/2/2010	West Yellowstone Snowmobile/Ski Lecture	26
1/2/2010	West Yellowstone 1 Hour Awareness	14
1/3/2010	West Yellowstone Snowmobile/Ski (field)	25
1/6/2010	Anaconda Snowmobile Club, Awareness	27
1/9/2010	Cooke City 1 Hour Awareness	12

*Continued...*

## Avalanche Education

1/12/2010	West Yellowstone HS, Awareness	112
1/13/2010	Big Timber HS, Awareness	0
1/14/2020	MT Western Univ Dillon, Awareness	42
1/15/2010	Sacajawea MS Bozeman, Awareness & Pit, Hyalite	120
1/16/2010	Cooke City 1 Hour Awareness	16
1/16/2010	West Yellowstone 1 Hour Awareness	22
1/20/2010	Stillwater Mine Group, Awareness, Columbus, MT	32
1/21/2010	MMA Teen Avy Awarness Talk	12
1/23/2010	MMA Teen Avy Field Day	8
1/27/2010	ASMSU/Friends Basic, Lecture Night #1	104
1/27/2010	GVSA/Rescue	40
1/27/2010	Wilderness/Trails USFS; Ava Awareness & Beacons	10
1/27/2010	Billings Harley, Awareness & Rescue	85
1/28/2010	ASMSU/Friends Basic, Lecture Night #2	96
1/30/2010	ASMSU/Friends Basic, Field Session @ BBowl	73
1/30/2010	West Yellowstone 1 Hour Awareness	63
2/3/2010	ASMSU/Friends Advanced, Lecture Night #1	25
2/4/2010	ASMSU/Friends Advanced, Lecture Night #2	25
2/5/2010	Belgrade HS Awareness	350
2/6/2010	ASMSU/Friends Advanced, Field Session @ BBowl	25
2/13/2010	Cooke City 1 Hour Awareness	35
2/13/2010	West Yellowstone 1 Hour Awareness	29
2/17/2010	Livingston HS Awareness	25
2/18/2010	Beacon Clinic w/City of Bozeman Rec Dept	15
2/19/2010	Sac Middle Schools @ Bear Canyon, Awareness & Pit	120
2/20/2010	West Yellowstone 1 Hour Awarness	19
3/4/2010	Saddle Peak Avalanche Debrief	200
3/5/2010	Professional Development Wet Snow workshop	30
3/17/2010	Park County SAR/Lecture	14
3/21/2010	Park County SAR/ Field Day	12
3/22/2010	Elks Club/General GNFAC info	20
<b>TOTAL = 64 Talks/Seminars/Field Sessions to 4,900 people</b>		

## Avalanche Education

The GNFAAC has been teaching avalanche classes through Associated Students of Montana State University (ASMSU), Outdoor Recreation since 1990. This year the Friends stepped in to assist with advertising, administration and staffing the courses. During our first offering in early December 290 people attended the two evening lectures with over 200 heading to Bridger Bowl for the field session. These courses are inexpensive. The Friends only charge \$30 for the entire session since we don't want to prohibit folks from learning about avalanches.

In March, the Friends helped the Avalanche Center host a professional seminar on Wet Snow Avalanches. Scott Savage organized this one day symposium for avalanche professionals. Thirty folks from Glacier NP, Yellowstone NP, NOLS, American Avalanche Institute, WY-DOT, MSU, and the local ski areas attended.

The Friends also worked with the Bozeman Recreation Department to offer a beacon clinic for the public. We will expand this relationship further next winter with the addition of a Beacon Park in one of the city recreation areas.

Our avalanche education outreach extends beyond formal classes and avalanche advisories. Working with the Friends we purchased a Beacon Park in West Yellowstone. Located on the main snowmobiling trail out of town, Dale Gullett and Adam Noorlander fenced off a few hundred square feet of flat ground and installed the Park. Four buried avalanche transceivers can be turned on or off through a control panel allowing the public to practice single or multiple burials. Yellowstone Vacations provided a \$600 donation towards this purchase.



*West Yellowstone Beacon Park.*

The Friends also bought two Beacon Checkers.

These portable units can be set up in high traffic areas for snowmobilers/skiers. They light up when an transmitting beacon approaches. In 2009 Travis Engstrom was killed in an avalanche outside Cooke City. He was wearing a beacon, but it was turned off. A Beacon Checker is another backup to make sure our safety gear is with us and working properly. One unit is dedicated to Cooke City and the other one will rove the trailheads of the Gallatin National Forest.

## Avalanche Incidents: Local

This winter was very unstable and active. We had a record of 87 avalanche incidents reported which resulted in three fatalities. A ice climber was swept to his death December 10th in Hyalite Canyon; a snowmobiler was buried and killed outside Cooke City on January 3rd and another snowmobiler was buried and killed April 14th on Buck Ridge.

The table on the next few pages outline this years avalanche incidents, both locally and nationally.

As of June 7 there were 35 avalanche fatalities in the US. The breakdown by state is: CO-8; ID-7; MT-5; AK-5; UT-4; WY-4; OR-1; WA 1.

DATE	LOCATION	DETAILS
10/6/2009	N. Bridgers	1 skier triggered, not caught
10/29/2009	N. Bridgers	1 skier triggered
10/29/2009	N. Madison	2 climbers triggered
11/12/2009	Bridgers	1 skier triggered, caught, buried to chest
11/12/2009	Bridgers	1 skier triggered
12/10/2009	N. Bridgers	1 skier triggered, not caught
12/10/2009	N. Gallatin	Many other climber triggered, not caught
12/10/2009	N. Gallatin	2 climbers, caught, not buried
12/10/2009	N. Gallatin	1 climber, caught, partially buried, killed
12/11/2009	N. Madison	1skier triggered, not caught
12/11/2009	Cooke City	1snowmobile triggered, not caught
12/12/2009	N. Gallatin	2 skier triggered, 2 caught, 1 partially buried
12/12/2009	S. Madison	1 skier triggered
12/13/2009	Big Sky Lenin	2 skiers caught, 1 partially buried
12/16/2009	N. Gallatin	1 skier triggered
12/16/2009	N. Madison	1 snowmobiler triggered
12/19/2009	N. Madison	1 skier triggered
12/24/2009	N. Madison	1 skier triggered
12/27/2009	Cooke City	2 separate snowmobiler triggered, 1 caught, not buried
12/28/2009	Cooke City	1 snowmobiler triggered
1/2/2010	S Madison	4 remotely triggered slides, no one caught
1/2/2010	N. Madison	1 remotely triggered slide
1/3/2010	N. Gallatin	1 skier triggered, caught buried
1/3/2010	Cooke City	1 snowmobiler triggered, caught, buried, killed
1/6/2010	Bridger Range	1 skier triggered slide, 1 partially buried, no injuries
1/6/2010	Bridger Range	1 snowmobile triggered
1/6/2010	Bridger Range	1 snowmobile triggered
1/7/2010	N. Madison	1 snowmobile triggered
1/7/2010	N. Madison	1 skier triggered
1/7/2010	N. Madison	1 skier triggered
1/15/2010	N Madison	2 separate skier triggered

*Continued...*

## Avalanche Incidents: Local

1/16/2010	N. Madison	1 skier triggered
1/17/2010	Lionhead	1 snowmobile triggered, not caught
1/17/2010	Lionhead	1 snowmobile triggered, sled damaged, not buried
1/26/2010	N. Madison	1 snowboarder triggered, not caught
1/27/2010	S. Madison	1 skier triggered, not caught
1/28/2010	Bridger Range	1 snowmobile triggered, not caught
1/31/2010	Lionhead	Many natural and human triggered. No one caught.
2/6/2010	Cooke City	1 snowmobile triggered, not caught
2/7/2010	Bridger Range	1 snowmobile triggered, not caught
2/7/2010	Cooke City	1 snowmobile triggered, not caught
2/8/2010	Bridger Range	1 snowboard triggered, not caught
2/8/2010	Cooke City	1 snowmobile triggered, not caught
2/9/2010	Bridger Range	1 skier triggered, caught, not buried
2/9/2010	Bridger Range	1 skier triggered, not caught
2/9/2010	Bridger Range	1 skier triggered, not caught
2/9/2010	Cooke City	1 snowmobile triggered, not caught
2/13/2010	Buck Ridge	2 snowmobile triggered, not caught
2/13/2010	Beehive Basin	1 skier triggered slide south facing, not caught
2/14/2010	Hebgen	1 skier triggered, not caught
2/14/2010	Wyoming Bowl	1 skier triggered, not caught
2/14/2010	Buck Ridge	1 snowmobile triggered, not caught
2/14/2010	Bridger Range	1 skier triggered, not caught
2/14/2010	Cooke City	1 snowmobile triggered, not caught
2/15/2010	Lionhead	1 snowmobile triggered, full buried recovered
2/16/2010	Bridger Range	1 skier triggered with a cornice drop, no one caught
2/17/2010	N. Madison	2 separate skier triggered, not caught
2/19/2010	Bridger Range	1 skier triggered with a cornice drop, not caught
2/21/2010	N. Madison	1 snowmobile triggered, not caught
2/24/2010	Cooke City	1 snowmobile triggered
2/28/2010	N. Gallatin	1 skier triggered
3/1/2010	N. Gallatin	1 skier triggered
3/4/2010	Bridger Range	1 skier triggered
3/9/2010	Mt. Jefferson	1 snowmobile triggered
3/13/2010	Cooke City	1 skier triggered
3/14/2010	N. Madison	1 skier triggered
3/14/2010	Bridger Range	1 skier triggered
3/21/2010	Gravelly	1 snowmobiler triggered, caught, buried, uninjured
3/23/2010	Bridger Range	1 skier triggered
3/23/2010	Bridger Range	1 skier triggered
3/24/2010	Bridger Range	1 skier triggered
3/26/2010	Bridger Range	2 separate skier triggered
3/30/2010	Cooke City	1 snowmobile triggered
3/30/2010	Cooke City	3 separate snowmobile triggered

*Continued...*

## Avalanche Incidents: Local

4/2/2010	Cooke City	1 snowmobile triggered
4/4/2010	S. Madison	1 skier triggered
4/4/2010	N. Madison	1 skier triggered
4/5/2010	N. Madison	1 skier triggered
4/6/2010	Bridger Range	1 skier triggered
4/14/2010	N. Madison	2 snowmobilers caught, 1 partially, 1 full buried, 1 killed

### 87 Incidents resulting in

- ◆ 21 people caught
- ◆ 9 partial burials
- ◆ 3 full burials
- ◆ 3 deaths



*Avalanches on Crown Butte outside Cooke City. Photo: Beau Fredlund*

## Avalanche Incidents: 20 years

### Local Avalanche Incident Data for 1990-2010

	Total Incidents	Skiers, Boarders, Climbers, buried	Snowmobilers buried	Skier, Boarder, Climbers, fatalities	Snowmobiler fatalities
2009-2010	87	6	3	1	2
2008-2009	45	4	12	0	3
2007-2008	45	4	11	1	0
2006-2007	26	3	5	1	2
2005-2006	22	1	7	0	2
2004-2005	35	4	4	2	0
2003-2004	25	2	1	0	0
2002-2003	40	4	17	0	3
2001-2002	35	0	7	0	3
2000-2001	42	8	4	3	1
1999-2000	30	2	3	1	0
1998-1999	13	3	1	0	0
1997-1998	29	8	9	0	4
1996-1997	20	1	2	0	0
1995-1996	22	4	13	0	2
1994-1995	23	8	3	0	0
1993-1994	23	5	2	0	1
1992-1993	35	6	8	0	1
1991-1992	25	2	2	0	1
1990-1991	10	0	5	0	0
<b>TOTALS</b>	<b>616</b>	<b>75</b>	<b>121</b>	<b>9</b>	<b>25</b>

#### Gallatin National Forest Totals:

- ◆ 25 snowmobilers and 9 non-snowmobilers died .
- ◆ 120 snowmobilers were partially or completely buried. 75 non-snowmobilers were partially or completely buried.

#### Cooke City area:

- ◆ 77 people were buried in the mountains . 16 people were killed in avalanches All fatalities were snowmobilers.

#### West Yellowstone area:

- ◆ 19 people were buried. 6 of the burials resulted in fatalities. All fatalities were snowmobilers.

#### Bridger Range:

- ◆ 16 people were buried in the Bridger Range. One skier was killed.

#### Elsewhere:

- ◆ 43 people were buried elsewhere on the Gallatin National Forest. Three skiers were killed, four climbers died, and 4 snowmobilers died.

## 2009-10 US Avalanche Fatalities: 35

DATE	PLACE	STATE	SUMMARY
6/05	Mt. Rainier	WA	11 caught, 2 partial, 2 full burials, 1 killed
5/29	Ruth Gorge	AK	2 climbers caught, killed
4/14	McAtee Basin	MT	1 snowmobiler caught, buried, and killed
4/4	Francis Peak	UT	1 snowmobiler caught, buried, and killed
4/2	Indian Creek	WY	1 snowmobiler caught, buried, and killed
3/30	Glacier NP	MT	1 snowboarder caught and killed
3/30	Near Baldy Peak,	CO	1 ice climber caught, buried, killed
3/30	Near Brundage Mountain	ID	3 snowmobilers caught, 2 buried and killed
3/27	Missoula Lake	MT	1 snowmobiler caught, buried, and killed
3/19	Southwest of Creede	CO	2 people caught and killed in a roof avalanche
3/13	Idaho Panhandle	ID	1 snowmobiler caught, buried, and killed
3/12	Near Antora Peak	CO	1 snowmobiler caught, buried, and killed
3/10	Steep Gully #1, west of Arapahoe Basin Ski Area	CO	1 snowboarder caught, partially buried, and killed
2/23	Lindley Backcountry Hut	CO	1 skier caught, buried, and killed
2/21	South Teton, Grand Teton NP	WY	1 skier caught, killed
2/13	South Fork Eagle River	AK	1 skier caught, buried, and killed
2/13	Grandview, Chugach NF	AK	3 snowmobilers caught, 2 buried and killed
2/11	San Juan Mountains	CO	2 skiers caught, 1 injured and 1 killed



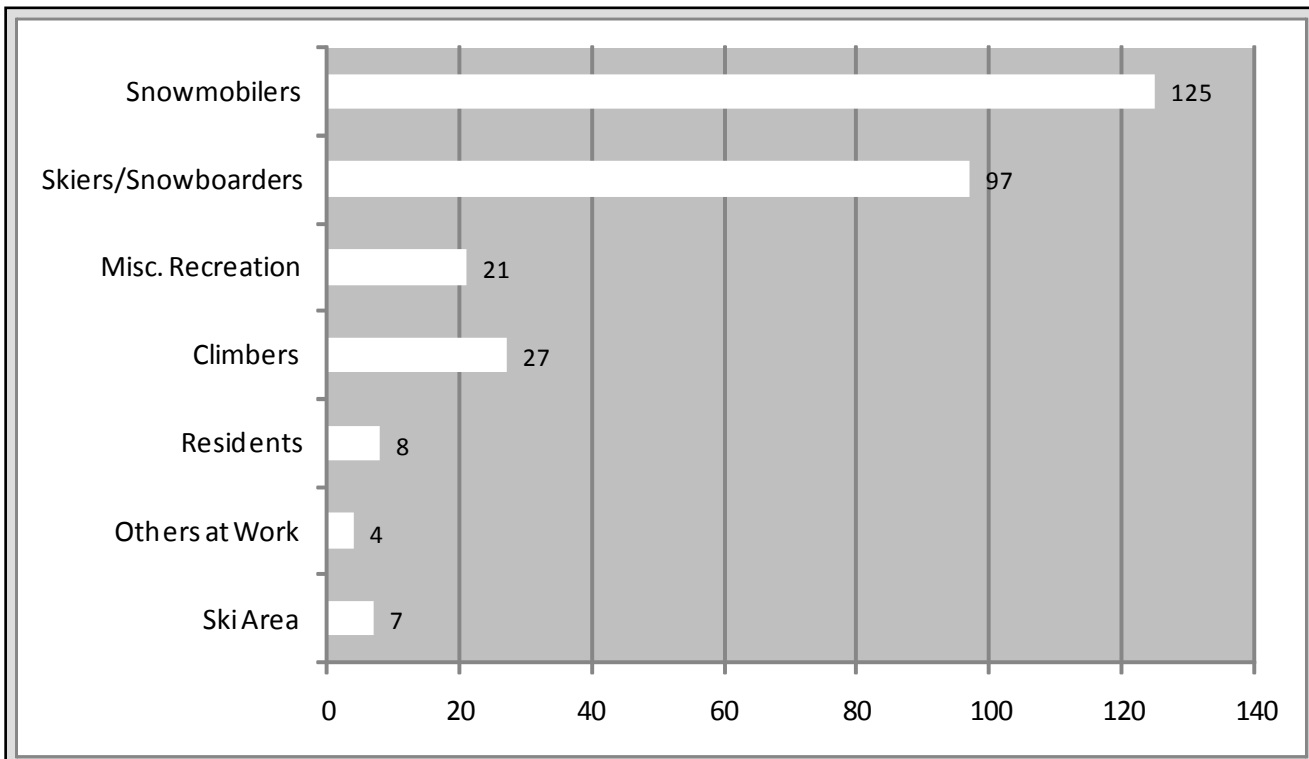
2/6	North Fork of Murphy Creek,	WY	1 snowmobiler caught, buried, and killed
1/30	Garns Mtn	ID	1 snowmobiler caught, buried, and killed
1/29	Grandview Pk, Session Mtns	UT	1 snowmobiler caught, buried, and killed
1/28	Boardman Pass, Soldier Mountains	ID	1 snowmobiler caught, buried, and killed
1/27	Near Solitude Ski Area	UT	1 skier caught, buried, and killed
1/24	Hells Canyon	UT	1 skier caught, partially buried, and killed
1/22	In bounds at Sun Valley Ski Resort	ID	1 skier caught, buried, and killed
1/6	Battle Mountain, Vail sidecountry	CO	1 snowboarder caught, buried, and killed
1/6	Jackson Hole Mountain Resort	WY	1 skier buried, recovered, and died in hospital
1/4	Cooke City	MT	1 snowmobiler caught, buried, and killed
1/2	Paulina Peak	OR	1 snowmobiler caught, buried, and killed
12/18	Rock Lake	ID	2 snowmobilers caught, 1 buried and killed
12/10	Hyalite Canyon	MT	1 ice climber killed

**Total: 35 Fatalities in the US**

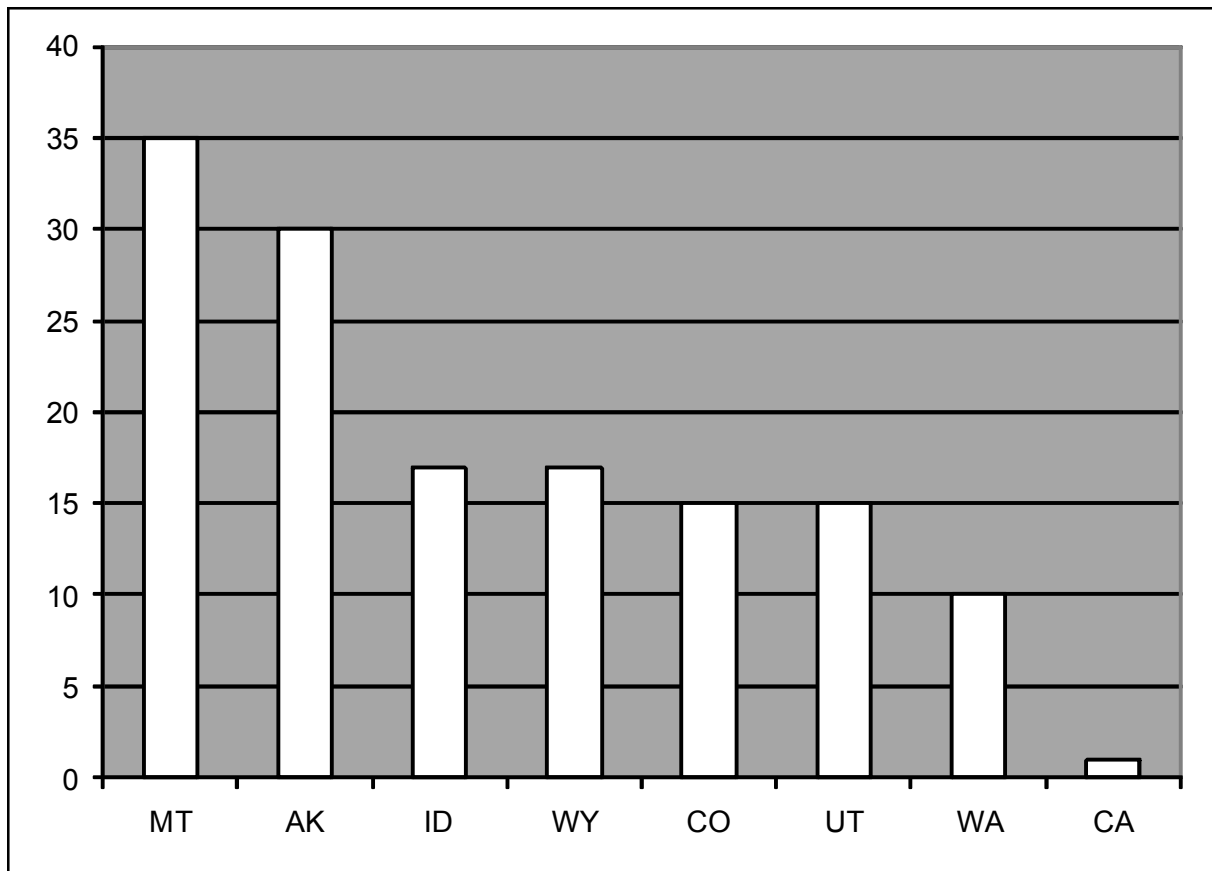
Activity	Fatalities
Skier/Snowboarder	10
Snowmobiler	17
Climb/Snowshoe/Hike	5
In-Bounds Skier/Boarder	1
Other	2

## Graph & Table of US Fatalities by Activity: 10 Years

ACTIVITY	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-winter totals
climbers	2	3	5	4	5	0	0	2	1	5	27
skiers/ snowboarders	12	11	11	6	15	8	9	11	5	9	97
in-area ski- ers/riders	0	0	0	0	2	0	0	1	3	1	7
snowmobilers	15	18	14	6	4	12	10	13	16	17	125
misc. recrea- tion	4	3	0	4	2	3	1	4	0	0	21
residents	0	0	0	3	0	0	0	2	1	2	8
others @ work	0	0	0	1	1	0	0	0	1	1	4
<b>Total</b>	<b>33</b>	<b>35</b>	<b>30</b>	<b>24</b>	<b>29</b>	<b>23</b>	<b>20</b>	<b>33</b>	<b>27</b>	<b>35</b>	<b>288</b>



## US Snowmobiler Avalanche Fatalities 1997-2010



*Mark Staples on the 2010 MTX Nytro.*

## Saddle Peak Avalanche


On February 16th Saddle Peak avalanched. Located in the sidecountry outside Bridger Bowl's boundaries, it's a popular skiing destination, especially since its in full view of the ski area. Skiers and boarders can hike the ridge out-of bounds to the summit of the 9,162' peak and ski its east face. At the bottom an easy traverse leads back to the ski area allowing folks to ski backcountry laps all day.

Although there were people on the slope when it released, miraculously no one was caught or killed. We used this incident as a teaching opportunity, which was unprecedented in its scope. Folks sent us dozens of pictures and videos that we immediately posted online. A few weeks later we held a Saddle Peak Question and Answer forum at the Bozeman Public Library which was attended by over 225 people. Randy Wimberg filmed the event which we posted on You Tube. This was viewed by an additional 900 folks.

Michelle Wolfe at 95.1FM KMMS, interviewed Mark Staples after the event too. This 16 minute discussion answered detailed questions about the avalanche. We posted this radio clip to our *Sidecountry* page too.

The next pages are a sampling how we addressed the danger on Saddle Peak pre and post event.

**Saddle Peak Avalanche: Q & A**  
Presented by the Gallatin National Forest Avalanche Center



When: Thursday, March 4<sup>th</sup>, 6:30-7:30 p.m.  
Where: Bozeman Public Library Meeting Room

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Come join the Gallatin National Forest Avalanche Center to discuss the snowpack, weather and circumstances leading up to the avalanche on Saddle Peak.

## Saddle Peak Avalanche

From the GNFAAC Avalanche Advisory the day after the avalanche:

### SNOWPACK AND AVALANCHES

#### The Bridger Range:

Yesterday morning at 11 a.m. a person triggered a large avalanche on Saddle Peak. Extreme luck was involved as no one was caught. A cornice the size of a VW van broke as a skier walked towards the edge of the ridge at the summit. The block slid downhill and triggered the avalanche. It broke 3-6 feet deep and went 1,000+ feet wide wiping out hundreds of ski tracks from Monday. A powder cloud was seen by most people at the ski area. Our [Photos page](#) of the website is filled with pictures which are more vivid than my words can describe.

The Bridger Range got a heavy snow load of 2 ½ feet of snow, or 3 inches of water weight, over the weekend. Strong winds created thick slabs adding further weight to the slope. And although skiers got lucky and didn't trigger it, the thousand pound cornice did. And the avalanche broke deep. It fractured on a layer of facets underneath the hard slab that we identified as a problem back on December 17<sup>th</sup>. Karl and I made a video that day which is well worth seeing again ([video](#)). After I turned off the camera I sarcastically said to him, "This is the video we're going to watch in Feb to explain why Saddle slid." And here we are.

The winds picked up yesterday afternoon and loaded slopes near the ridgeline even further. The rate of loading was fast enough that Mark and I opted to call off the search for possible missing skiers since a dozen of us were standing under the maw of another huge avalanche path

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Take a hard look at the photos. If you skied off the summit on Monday and find that your tracks are now obliterated, ask yourself, "What did you do to arrive at the decision to ski that slope?" Now that it slid there's no argument about whether it was stable or not. It wasn't. But hundreds dozens and dozens of skiers thought it was good to go. Perhaps I would have been one of them, but if I had I would want to puke looking at those photos, knowing how close I would have been to dying. Seeing tracks in fresh powder is commonly mistaken as a sign of stability, but it's not. Folks think that often skied slopes are safer because the weak layer gets broken down and compacted by the tracks. But in this case the weak layer was impervious to tracks because it was preserved under a supportable hard slab. Supportable until yesterday.

Three inches of snow water equivalency fell in under 48 hours. Strong winds created drifts, adding even more weight. And facets hibernating deep in the pack finally couldn't hold up any more snow. That's what happened.

We are extremely lucky. I could be writing my condolences to 15 families this morning. Many people would have died if the slope slid the day before or a few hours later. Most days skiers are stacked on top of one another, exposed to avalanches from above. Luckily, it was triggered early in the day with few skiers around. Consider this avalanche the one and only free wakeup call we'll ever get. There's a lot to learn. The slope slid on a beautiful day with many tracks on it. It was undeniably unstable, yet provides us with an opportunity to re-evaluate how we ski, make decisions and travel in the sidecountry.

## **Carve Article, January 2010**

### **SIDECOUNTRY SAFETY MYTHS**

Riders, parents should never underestimate the danger lurking beyond the ropeline

By Doug Chabot

Sidecountry is defined as out-of-bounds, backcountry terrain that is accessed from a ski area. The ski lifts make getting to the backcountry easier for everybody and more accessible to the uninitiated, but does not provide any more safety since there is no avalanche control or ski patrol services in the out-of-bounds.

Moonlight Basin, Big Sky and Bridger Bowl all have gates that enter the sidecountry. The dangers are the same regardless of the jumping off point, but Saddle Peak outside Bridger Bowl has the most sidecountry traffic because of easy access and long, beautiful runs in full view of the lift. On clear, beautiful powder days, we have to careful not to tie our emotions to fresh snow.

Avalanches are all about timing. Some days are safer than others in avalanche terrain. The key is to know the difference. The Avalanche Center can help you make intelligent, informed decisions through our daily avalanche advisories, but in the end it's up to you. Although we give general advice and data for mountain ranges, individual slopes require individual scrutiny. The advisory only provides a framework for reaching good decisions, but reaching them is, as mentioned, up to you.

To even contemplate going out of bounds, the minimum essentials are a solid, practiced partner to watch your back and rescue gear of a beacon, probe and shovel. Besides having a friend and some gear, it's worth knowing how avalanches work. Instead of learning this through trial and error, take an avalanche class.

Don't base decisions about skiing the sidecountry on what's happening inside the ski area. Ski areas are made safe through constant upkeep by the ski patrols. Cornices get shoveled, wind drifts blown up, rocks marked and warning signs posted. The sidecountry is different, even if on the surface it may look the same. Here are some common misconceptions:

#### **Ski tracks on a slope means it's safe and won't avalanche.**

Although it seems like this would be true, it's not. An avalanche needs four things: a steep slope, a trigger, a slab of snow and a weak layer underlying the slab. It's erroneous to think that if a slope gets enough tracks the weak layer gets chewed up and loses its uniformity and ability to avalanche. Weak layers can form at the surface and get buried deeply, thereby being preserved and unaffected by future ski tracks. At times a supportable hard slab will allow carving steep lines without consequence, but a thinner spot, usually found around rock outcrops, trees or near the flanks of slopes, will give away and propagate a fracture pulling out all previous tracks. That's why tracks are an unreliable indicator of stability. Many people have been fooled by this, including experienced avalanche pros. There are many ways to determine whether or not a slope is safe, but tracks on a slope is not one of them. Experienced skiers examine the weather and snowpack very carefully and do not blindly follow what others are doing.

*Continued...*

## Carve

### **The patrol wouldn't keep the boundaries open if it was dangerous.**

The gates are a de-facto trailhead and they are *always* open to all ages and all abilities. The ski patrol is concerned with conditions inside the boundaries, not outside. It's always more dangerous in the backcountry because it's uncontrolled and unpatrolled. The decision to cross through the gate into the unpatrolled backcountry is yours alone, as it should be. You're free to make your own decisions and to face your own consequences.

### **The ski patrols do avalanche control out there.**

This is an urban myth. It is untrue that someone knows someone who talked to someone who's buddy is on ski patrol who told them they control the sidecountry. This is false. It is ALWAYS false. Ski patrols do not do any avalanche control outside their permitted boundaries. Ever. Period.

### **"I carry my own gear, I'm safe, I won't get into trouble."**

This carries weight if it's just you and your partner skiing safely all alone. But sidecountry skiing has unique problems typically never encountered in the backcountry—namely other skiers. Skiers dropping in above others put elevated risk on those below. No one ever plans on triggering an avalanche, but releasing a slide carries extra consequences for those down slope. It's one thing to personally pay the price for your mistake, quite another to have someone else pay it. Skiing above others is a hazard mostly unique to sidecountry.



Adults are (usually, in theory, by definition) equipped to make informed decisions regarding their lives and safety. They can drink, go to war, vote and basically do whatever they want (provided it's legal). Young adults are not so equipped. Parents sign release forms, chaperone, have curfews and set rules outside of the legal system to provide guard rails on their children's roads. Death and serious injury should not be part of the young adult learning curve, yet skiing the sidecountry is seriousness business. That's why parents need to make informed decisions regarding the complexities of sidecountry skiing. The Avalanche Center and Bridger Bowl made a 10 minute video last year titled Stay Alive. If you're unfamiliar with the sidecountry it's a good place to start. If your kid has a beacon and shovel to ski the Ridge, do not assume they will stay within the ski areas. Outline your expectations clearly. Traveling in the backcountry carries great risk and personal responsibility. Every year adults die in avalanches. We do not want to see teenagers die in them as well.

## Saddle Peak Survey

We did a preliminary survey on Saddle Peak users in March. Mark Staples went up to the ridge on two separate occasions to survey people headed to Saddle Peak. We plan on querying more people next year, but this sampling is a start for us to understand where the Avalanche Center can focus our educational resources.

This is what Mark wrote in an email about his results:

Well, I've logged two days now interviewing people leaving Bridger to hike Saddle Peak. On those two days I've found:

- over 90% of the skiers were men
- 14-26% had no shovel
- 27-41% had no probe
- 3-14% were skiing solo
- 10-32% had never skied Saddle before
- 12% were minors without an adult
- 31% had read that day's advisory
- 0% attended the Saddle Peak Q&A at the Library

The average age was 32 and the median was 30.

Neither of these two days were really busy. One was a Saturday, one was a Friday.

General Impression: From talking to people, it seems like there is a slightly different attitude and fewer skiers on Saddle after the avalanche.



Avalanche on Saddle Peak, Feb 16. There were many ski tracks in the "Football Field" to the right of the path. The slope that slid had similar skier compaction, but it did not help the stability. Photo: Sean Sperry



## International Snow Science Workshop 2010

The avalanche incident on Saddle Peak provided us with a very unique study. We had lots of snow data, stability tests, videos and pictures of the slope in the months leading up to the avalanche. The slide was human triggered and had unprecedented documentation. One of the more interesting aspects of this slide is the human factor: how people came to the decision that it was ok to ski the slope. Myths, and misconceptions clouded many skiers thinking. Luckily no one died, which allowed us unprecedented freedom to deeply explore the incident without emotional baggage. We compiled this information and are hoping to present it at the International Snow Science Workshop in Tahoe this October. Here is our abstract proposal:



*The Saddle Peak Avalanche powder cloud, seen from a chairlift at Bridger Bowl. Photo: A. Swanson*

### **2010 Saddle Peak Avalanche: Sidecountry challenges, misconceptions, and lessons**

Doug Chabot, Mark Staples, Karl Birkeland, Eric Knoff

On February 16<sup>th</sup>, 2010 a person accidentally kicked off a cornice that triggered a large slide on Saddle Peak immediately outside Bridger Bowl's boundary. This slide narrowly missed killing several people, and the immense snow cloud from the avalanche was seen throughout the ski area. While the avalanche surprised many, avalanche professionals both at the Gallatin National Forest Avalanche Center and Bridger Bowl have anticipated the possibility of such an event since this sidecountry area was opened up two years ago. We have tried to educate the public about the accident potential through signage, articles, a special DVD, and education efforts targeting youth and their parents. Despite our best efforts Saddle Peak is heavily skied by all ages, usually one on top of another with no regards for and apparent knowledge of safe backcountry travel techniques. More, the erroneous belief that skier compaction is keeping the slopes safe has become widely accepted. The fallacy of skier compaction for preventing large hard slab avalanches was graphically demonstrated by this slide. In December 2009 a layer of facets was buried by a supportable hard slab impervious to the thousands of skiers who skied the slope during the season. In mid-February a storm dropped three inches of SWE, setting up the conditions leading to the slide. Through video clips and photos shot during and immediately following the avalanche, along with video clips explaining the pre- and post-avalanche snowpack, we will explain the who, what, why, where, when and how of this impressive slide.

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## Finances and Fundraising

The Avalanches Center's largest source of financial backing comes from the Gallatin National Forest. The Forest spent over \$99,000 for salaries, benefits, travel, office, vehicles, and computer support. However, as we expand our programs we rely more on community support, grants and donations to cover our shortfall. The rest of our monies came from the following groups, agencies and businesses.

### THE FRIENDS OF THE AVALANCHE CENTER

The Friends of the Avalanche Center have supported us since their inception in 1992. Page 27-29 details their contributions and fundraising efforts. The Friends cover all our administrative, snowmobile and avalanche education expenses. This season their entire contribution totaled \$32,700.



*Skinning up Cedar Mountain*

### MONTANA FISH, WILDLIFE AND PARKS, RECREATION TRAILS GRANT

MT Fish, Wildlife and Parks continues to be a strong advocate of our avalanche program. This winter we were awarded \$35,000, the maximum amount, for use at the GNFAC. This is the 11th year they've awarded us a Recreation Trails grant. Parts of these monies were used this year with the rest earmarked for next season. *This is the single largest donation we have ever received.* A huge thanks goes to Steve Gilbert at FW&P for his continued support.

### GALLATIN COUNTY SEARCH AND RESCUE

Gallatin County SAR has been the Avalanche Center's partner since our start 20 years ago. They donate \$4,000 annually to our operation. We work very closely with GCSAR since they perform backcountry rescue in our region. Sgt. Jason Jarrett and Sheriff Jim Cashell run an exceptional crew of dedicated and well trained volunteers.

### NATIONAL AVALANCHE CENTER

The NAC reimbursed the Forest Service for salaries spent teaching at the National Avalanche School in Snowbird, UT last October. Run every other year, the NAC and NSAA partner together to pay for Forest Service instructors. This year they reimbursed us with \$1,770.

## Friends of the Avalanche Center

The Friends of the Avalanche Center is a non-profit 501(c)(3) organization. They provide a means for individuals and organizations to financially support the work we do. In order to operate the GNFAC at our current level we need outside funds.

The Friends were founded in 1992. Since then, they've donated over \$182,000 to the GNFAC. Most of the monies came from local businesses and individuals in southwest Montana.

The Board of Directors represent a varied slice of the community and they all work together to help make the Avalanche Center a successful organization. The Board of Directors include: Jeannie Wall (President), Jay Pape (Treasurer), Greg Caracciolo, Laura Ryan, Dale Sexton, Mike Harrelson, Lance Riek, Alan Oram, Ben Zavora, Adam Knoff and Scott Savage.

### **Where the money got spent:**

#### **AVALANCHE EDUCATION PROGRAM**

Most of our education efforts are coordinated through the Friends. For the fourth year in a row they've employed Jay Pape to organize and teach avalanche education programs.

- ◆ The Avalanche Education Program cost \$14,500 this winter. This includes, payroll, liability insurance, lodging, teacher supplies, bacon checkers and a beacon park.
- ◆ The Friends also awarded \$2,200 in scholarships to the International Snow Science Workshop in October. This paid for the registration fees for two people from each of the four local ski areas plus MSU.

#### **GNFAC SUPPORT**

The Friends give us direct financial assistance every year. These fall into many categories:

- ◆ Administrative. The Friends pay for things outside our normal operations such as brochures, software, beacons, office supplies, editing services, email subscription service, fees to professional workshops. This totaled \$5,400.
- ◆ Snowmobile. Team Bozeman partnered with Yamaha to loan us snowmobiles again this year. LeAnne Gullett and Craig Gagne helped put this deal together. This season we rode two Nytro four-stroke sleds. The Friends paid for maintenance, insurance, and repairs which totaled \$3,600.
- ◆ Web Site. Jim Earl remade our entire website last summer and fall. We launched it at the beginning of the season for a cost of \$4,800.
- ◆ Cooke City Weather Station. The Friends purchased a remote weather station dedicated to Cooke City. Mark Staples set it up early in the winter at Lulu Pass and it fed us steady data all season. This cost \$3,300.

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## Friends of the Avalanche Center

### Where the money comes from:

#### **POWDER BLAST**

We held our 11th Powder Blast on October 23rd at the Emerson Cultural Center. For \$30 folks got dinner, music, drinks and tables of silent auction items. We sold 250 tickets and raised a record \$20,356, which was quite unexpected and incredible given the sagging economy.

#### **BRIDGER BOWL: KING AND QUEEN OF THE RIDGE**

Bridger Bowl held the 8th King and Queen of the Ridge on February 13th. Individuals and families hiked laps on the ridge for pledges. All proceeds went to our avalanche education program. This year 80 competitors raised \$19,000 for the Friends which will be used for next year's classes. *Since the first King and Queen in 2003, Bridger Bowl has helped raise \$86,900!*



*ASMSU avalanche class at Bridger Bowl.*

#### **TEAM TYLER**

Tyler Stetson died in an avalanche in Beehive Basin on January 20, 2008. His family and friends rallied around the King and Queen to raise monies for our education efforts in Tyler's honor. His mom, dad, and sister all hiked along with 30+ other friends. They raised over \$15,000 for us! The Friends are preserving Tyler's memory in the form of scholarships and avalanche education opportunities for both professional avalanche workers and backcountry users.

#### **HANS SAARI MEMORIAL FUND**

For the third year in a row the Hans Saari Memorial Fund awarded the Friends a \$5,000 grant for their education programs. Hans was a local skier, writer and friend who died in 2000. His name and spirit live on through the fund.

#### **PINHEAD CLASSIC**

This year Paul Neubauer and Warren Bauder organized the 28th Pinhead Classic telemark festival and raised \$1,000 for the Friends. Over the years the Pinhead Classic has raised \$13,500 for us!

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## Friends of the Avalanche Center



### **MONTANA ALE WORKS**

Albert McDonald, General Manager of Montana Ale Works, organized the second annual fundraising dinner for the Friends on February 8th. Mountains of the World was a sell-out evening of an international five-course meal paired with great wine. Forty folks indulged themselves and the restaurant donated their proceeds of \$3,000.

### **YELLOWSTONE CLUB**

The newly formed Yellowstone Club Community Foundation awarded us a \$5,000 grant that we will use for the 2010-2011 season. This is the fourth winter in a row that the Club has supported our operation. Tom Leonard, Ski Patrol director, has been instrumental in helping us secure these grants.

### **OTHER DONATIONS**

Many people contribute to the Friends of the Avalanche Center. Pamela Anderson Wallace donated \$3,500 for avalanche education. We also got a recurring Anonymous \$1,000 gift. LeAnne Gullett of Team Bozeman gave a \$1000 donation in memory of her husband Cliff who was huge supporter of the Avalanche Center over the years. The Gallatin Valley Snowmobile Association gave us \$200 plus an additional \$245 in memory of Steve Green, a well known local who died in an avalanche on Buck Ridge this April. The Cold Smoke Awards donated part of their proceeds again, raising us over \$5,000 through the years. And all the avalanche classes raised \$8,500 in donations.

## Projects



We developed SnowPilot ([www.snowpilot.org](http://www.snowpilot.org)) in 2003. It's a free software package that allows users to graph snowpit observations and store it in a central database. Researchers can then search over 3,700 snowpits throughout the world for their studies while general users can keep personal snowpits archived online. For next season SnowPilot will adopt the new International Classification for Seasonal Snow on the Ground as well as format the data to in CAAML an XML standard. With these updates SnowPilot will remain useful for all snow professionals and recreationists. And best of all, it's FREE.



The Avalanche Center, Friends, Bridger Bowl and Sam Lowe made Stay Alive, a movie about sidecountry avalanche danger, for the 2008-09 winter. Since then a new version was edited for a national audience. The American Institute for Avalanche Research and Education (AIARE) included this dvd in a nationwide education campaign this past winter. Additionally, the National Ski Areas Association (NSAA) awarded Bridger Bowl their “Best Avalanche Safety Program” for 2009-10. They recognized our community partnership and film as a part of an award winning effort.

## Donated Labor and Equipment

It would be impossible for the GNFAC to operate at its current level without the local community donating time, expertise and equipment. When it's added up, their work totals \$39,000. These donations reflect a dollar estimate of what it would cost to hire people or buy/rent equipment.

### TEAM BOZEMAN AND YAMAHA

Craig Gagne, the Yamaha Rep, is an advocate of the GNFAC and worked diligently with Team Bozeman to secure us two Nytro four-stroke sleds this winter.

Equipment:	
Team Bozeman/Yamaha	\$8,000
Northern Lights Trading Company	\$3,000
Labor:	
Big Sky Ski Area	\$2,000
Bridger Bowl Ski Area	\$2,000
Yellowstone Club	\$2,000
Moonlight Basin	\$2,000
National Weather Service	\$2,000
National Park Service	\$1,000
NRCS	\$3,600
Volunteer observers	\$7,000
Field volunteers (600+ hours)	\$10,000
<b>TOTAL</b>	<b>\$39,000</b>

### NORTHERN LIGHTS TRADING COMPANY

Jay Allen, owner of Northern Lights Trading Company, continues to support the Avalanche Center—something they've done since we started in 1990. They loan us skis and boots plus offer discounted equipment.

### FIELD VOLUNTEERS/OBSERVERS

In order to put out our daily advisory we rely on a dedicated group of volunteers. Over 60 individuals give us their snow and avalanche observations on a regular basis. Beau Fredlund in Silver Gate saved us days of work with his accurate and frequent assessments of the Cooke City area. We are also thankful for the combined efforts of Bridger

Bowl, Big Sky, Moonlight Basin and

Yellowstone Club Ski Patrols. Lucas Zukiewicz and Austin Beard at the NRCS gave us valuable weather instrumentation assistance and valuable snowpack information. Also the Snow Rangers on the Gallatin National Forest gave us detailed backcountry snowpack information. In particular, Tim Campbell and Brad Bolte took the time to send us pictures and videos of avalanche incidents.

# Budget

## Income

### Montana FW&P Rec Trails Program

- ◆ RTP 2009 \$28,228
- ◆ RTP 2010 \$2,230

National Avalanche Center \$1,770

Gallatin County Search and Rescue \$4,000

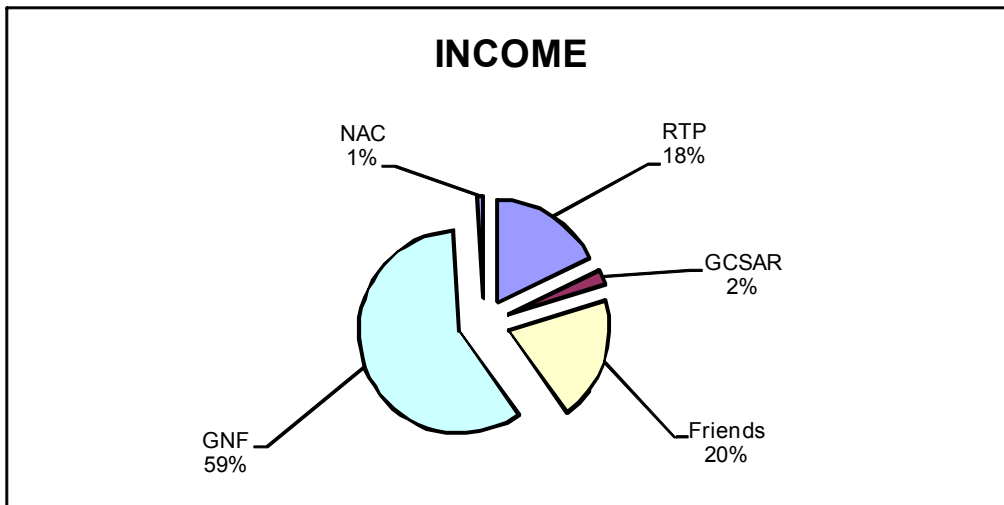
### Friends of the Avalanche Center

- ◆ Avalanche Education Program \$16,700
- ◆ Administrative Support \$5,400
- ◆ Snowmobile expenses \$3,600
- ◆ Website redesign \$4,800
- ◆ Cooke City Wx Station \$3,300

TOTAL CASH CONTRIBUTIONS \$70,028

TOTAL GALLATIN NATIONAL FOREST CONTRIBUTION \$99,8530

TOTAL INCOME \$169,881

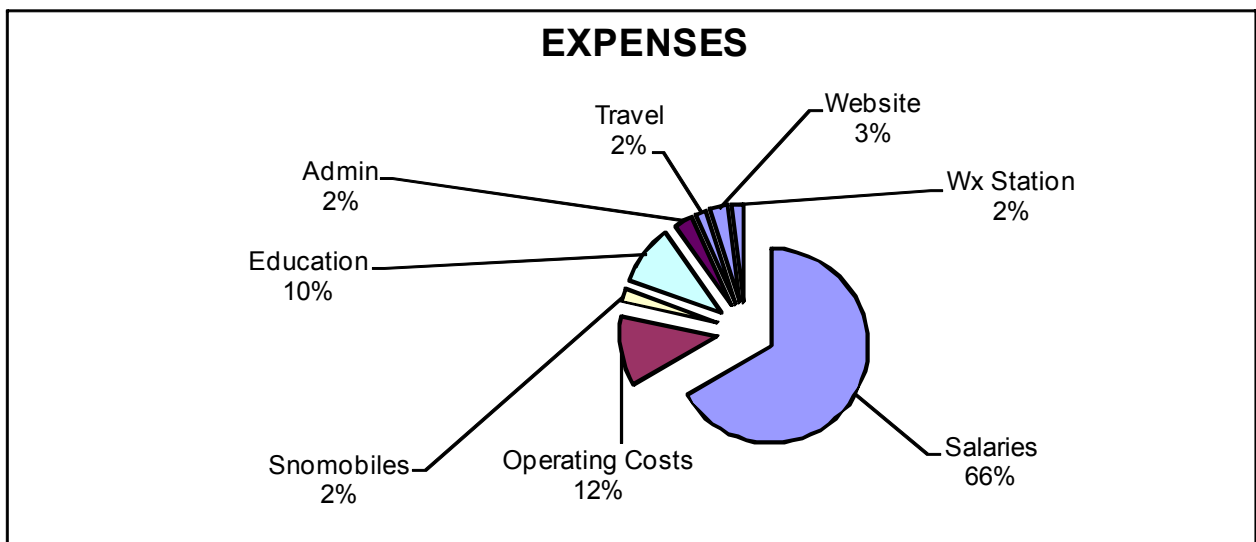




# Budget

## Expenses

Salaries/OT/Benefits	\$113,081
GNF operating costs	\$20,000
Travel/OT/benefits	\$3,000
Snowmobiles equip/maintenance	\$3,600
Education	\$16,700
Administrative costs	\$5,400
Website redesign	\$4,800
Cooke City Wx Station	\$3,300
<hr/>	
<b>TOTAL EXPENSES</b>	<b>&lt;\$169,881&gt;</b>



## Seasonal Weather Summary

By Mark Staples

Winter came early to southwest Montana with the first recorded avalanche on October 6 followed by 8-12 inches of snow and single digit temperatures a few days later. Near the end of October another notable storm dropped 1-2 feet of snow near Bridger and Big Sky and less further south. This pattern of less snow in the southern half of the advisory area than the northern half would continue into December. November started with record heat and the first faceted layers of the season with warm sunny days and clear cold nights. In the second week on November cool and wet weather returned. Rain fell on November 11 then snow on November 12 with two feet of snow in Bozeman. This interesting storm deposited more snow in Bozeman than in the Bridger Range, and more snow in Dillon than in Big Sky. Near West Yellowstone temperatures were significantly warmer, and most of the precipitation from this storm occurred as rain. The rest of November saw a series of small snow storms mixed with periods of clear weather.

The defining weather event was a period of extremely cold weather starting the first weekend of December. A foot of snow fell December 5 followed by a rapid drop in temperatures. For the next five days, temperatures were -10 to -20 degrees F. This period of cold weather caused significant faceting in the snowpack and set the stage for future avalanche activity. More snow in December slowly accumulated forming a slab on these facets. By January 1 heavy snow in the



*November snowstorm.*

southern mountains caused us to issue a warning for two days. More snow fell January 6 throughout the advisory area (2 inches of SWE in the Bridger Range) prompting another warning and the most widespread avalanche cycle in the past 20 years. The rest of January received just enough snow to keep the snowpack sensitive to human triggers. By February 10 a short period of clear weather created a layer of near surface facets and surface hoar. By

Valentine's Day February 14, another major storm deposited new snow totaling 3 inches of SWE in the Bridger Range. Following this storm, facets near the ground on Saddle Peak reached their breaking point and produced a massive avalanche.

A month long dry spell ended in mid March with a series of storms. Unfortunately dry weather had weakened the snow surface and avalanche activity spiked with each storm. Snowfall continued into the first part of April providing good powder for skiing and riding. With persistent weak layers in the snowpack and heavy spring storms, we finished the season without a single day having a LOW danger.



*Skier at the crown of the Saddle Peak avalanche. Photo: Randy Wimberg*

## Support Emails and Letters

Hi guys, just wanted to say THANK YOU for your hard work!! I wanted to give you a little feedback on the new format of the avy reports on your website- they are fantastic! I love the interactive map and gps coordinates that shows where the activity took place. Unfortunately I live in the Midwest so I don't know the terrain like you guys do but I REALLY like being able to see where the avalanche(s) took place as well as the detailed summary that follows. It really gives good context as to where the incident took place. Anyways, just wanted to let you guys know I love the new format and really enjoy getting the daily reports and watching the snowpack evolve as the season progresses.

Thanks for all your efforts, without the work you guys do a lot more lives would be at risk!!

Take care and be safe,

Jefferson Bey

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I can barely stand up on skis, and for us an inch of snow is an event! But I love weather, and I really enjoyed watching your reports last season. I know it's serious business - I was rather shocked to realize how many deaths occur each year - but please also know that your efforts and the science behind them makes an excellent daily online diversion. I'll probably never use it, but that doesn't mean it's not fun to learn how wind and weather affect the snow - seems like it's almost alive under the surface.

Again, thanks so much for what y'all do - although it may not affect me directly, I sure do appreciate and enjoy it.

---

You guys do a great service to those of us from not within the mountain territories. Although there are no avy training courses in MN, I use the resources on your website to learn as much as I can, in order to stay safe when we make our treks out into your beautiful country.

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My sincere thanks and appreciation for the work you do...it may just have kept me alive in the past, or will keep me alive in the future. At the least, I will be informed and not totally ignorant when making those backcountry decisions.

Best Regards,  
Andrew

---

Hi Eric,

I'm writing to express my appreciation for you guys and your reports.

Today's was great. I read them every day, and find them very readable and easy to learn from. I hear similar info from our snow safety team at Moonlight, but reading it from you guys in different language/format helps me.

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Thanks for helping inform and educate our community.

Best,  
Emily

---

I attended a training in West Yellowstone in December led by Mark. I just wanted to say Thank You and let you know that he did a great job! I learned a lot and this will be a great value to me.

---

Just want to drop a note letting you guys know what an awesome job you're doing trying to keep us all safe in the backcountry. Seems like I've been seeing advisory info in the papers and other places more than in the past. Sure you guys have had some sleepless nights for sure. Thanks again!

---

Are that you guys continue to provide an accurate and very valuable daily service to the friends of the backcountry. Keep up the professional work! Thank you!  
Mark Watkins

---

You guys are really great! I have learned alot about avalanches and all the troubles going on out west. Keep up the great work!

---

Great job on the advisories guys. I really am liking the new style. I am trying to separate the advisories from the summaries for my site offering only the structure of the snow pack and not so much observations.. Today's advisory is a good example, making the information more decipherable.

Thanks again and great job!  
Joe Turner

---

I thought I'd write and tell you how much I enjoy your reports even though it's safe to say I'll never "use" your information. If you've been wondering about all those hits from rural Georgia last year, now you know...

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Greetings Doug, Mark, and Eric,

Everyone needs a little positive feedback from time to time, so here is my installment to you guys! Just wanted to hear that at least one guy, admittedly a winter mountaineering novice, thinks your daily advisories are extremely valuable. I'm old and working too hard to get as much experience as I'd like in the mountains this winter, but thanks to your advisories, photos, and videos, I'm still able to learn a lot about mountain weather, snow conditions, and avalanche behavior. Not to worry, I'm not going to mistake book learning for experience! But when I do get out into the Beartooths – my preferred recreation paradise – I'll be more aware and looking to apply what I've learned from you guys. You hare having a positive impact on lots of folks, so please keep up the good work!

Regards,  
JR

---

Just wanted to write and thank the GNFAC crew for a superb job with the regional avy forecasting this year.

You guys make the resource what it is. Top notch. Super valuable.

Keep up the good work, and drop me a line if anyone is keen on a tour around Cooke City, or Red Lodge this summer.

Cheers,  
Beau

---

As usual, a number of things conspired to keep me out of the backcountry as much as I would have liked, but your reports were extremely helpful in planning the trips I did undertake. Thanks for all the hard work and we'll catch you next year...

Martin Neunzert  
Ogden, Utah

---

Thanks to you and all the hard work you do for the 2009-10 winter season! My season was cut short a month ago with some broken ribs suffered at the expense of showing my kids old free-style maneuvers in the terrain park. Like you, I am looking forward to spring and the coming summer to pursue what ever adrenaline sport of choice that seems to be part of the make up of avalanche and other outdoor professionals. So, a salute to you and all you pursue; remember launches are always optional, and good landings are always mandatory. Have a great summer! JG

---

Thanks so much for all your hard work this winter, and for getting back to me recently with your words of wisdom. Much appreciated! Hope your spring treats you well, here's to some stable skiing (hopefully?)!

---

Thanks so much you guys, I can't tell you how much we appreciate what you do for us! Long live GNFAC!

---

Many thanks for a safe season guys. Never got rid of that 2 feet of crapola we got in the beginning - tough to start the season with ball bearings.

---

Doug and Team,

Once again our team (of 4) flatlanders (MN) that come out 3 times a year to southwest Montana had safe and incredibly fun snowmobile adventures exploring the backcountry! Your expertise and daily guidance is very much a key to the success of these outings. You guys are truly a team of professionals that "add value" to our world!

---

Thank you!

---

You guys rock, thanks for all the hard work... I think I speak for all the back country riders and skiers when I say we appreciate all you do!

Have a good spring and summer too!

Jim from Billings

---

Thank you guys for everything this season. I don't know where I'd be without you guys! I'd be interested in receiving a copy of the detailed report when it's finished. Thanks again!

- Nick Stayner

---

Hey guys~

I very much enjoy your daily emails. I'm from the flat country back in Wisconsin, but still look forward to each and every advisory. A group of us were out to Montana this year and attended an hour long lecture which was a sobering reminder for all of us and am sure helped keep us out of harms way. Not sure if you are sending out the annual report by email or snail mail, but I look forward to reading it, below is my home address.

Thank you for all that you guys do and keep up the great reports. Looking forward to next season!

Shawn Black

---

Hi All,

GREAT presentation last night!

Just want to say a heartfelt 'thanks' for all your work - and tell you how impressed I am by your demonstrated expertise in your 'field' of study and the professionalism you convey in working with the public.

The Forest Service is so lucky to have you all on board; you give the agency credibility and reason to be respected!

Alane

---

Guys,

Thanks for the great season of information. Wish it was a better snow year but, thanks for keeping us safe. The two day course in West Yellowstone was very good and we learned a great deal.

Thanks Again,

Jeff & Diana Boyle

---

Dear GNFAC Staff,

Just a quick note to say thank you for yet another fine season of avalanche reporting. Your objective approach combined with just the right blend of humor and reality make for an enjoyable read every single morning during the winter months. I look forward to 2011.

Sincerely,  
Sam Haraldson

---

You guys did a fantatic job this year of educating and informing people about the stability of the snowpack. The You Tube videos were impressive.

---

Doug, Mark and Eric,

Many thanks to you guys for a great year! Thank you for ending it with a memory of Tyler.

Best wishes for a safe and productive summer,

John

---

Doug, Mark, and Eric,

As a dispatcher in the Yellowstone National Park Communications Center, I want to thank you for all the work on the daily advisories throughout the season. The daily forecast and all the associated information that you include is much appreciated and always interesting. Thanks again for all the work.

Edwin Folts, Dispatcher  
Yellowstone National Park

---

Thank you for investigating.

Steve is a good friend of mine. I worked at scrubbys for 2 years while i was in college and it is such a shock. He was so experienced out in the mountains and I thought that if anyone would be able to recognize a dangerous situation, it would be him.



Thank you for all you do to keep this kind of situation from happening more often. I spend all of my free time out in the mountains (skiing, hiking, etc) and I always check the hotline before I go out because you guys do such a comprehensive analysis of the snowpack and your information is invaluable.

Let me know if there is anything I can do to help...



04/06/10

GNFAC,

Thanks for another season of collaboration. Your input and information help out immensely throughout the year, especially with public education of sidecountry conditions and dangers. Look forward to next season and being able to work with you again.

Pete Maleski

Bridger Bowl Snow Safety

A handwritten signature in black ink, appearing to read "Pete Maleski", is written over the typed name.

15795 Bridger Canyon Road • Bozeman, MT 59715  
406.587.2111 • Fax 406.556.5720 • [bridgerbowl@imt.net](mailto:bridgerbowl@imt.net) • [bridgerbowl.com](http://bridgerbowl.com)



YELLOWSTONE CLUB

Gallatin National Forest Avalanche Center  
Doug Chabot, Director  
PO Box 130  
Bozeman, MT. 59771

April 4, 2010

Dear Doug,

I would like to congratulate you and your crew on a job well done this year. Now that the winter season is winding down I would like to thank you, Mark, and Eric for your first rate job of weather and avalanche forecasting. This year's early season snow followed by such a dry mid winter certainly brought out the challenges in dealing with a persistently weak snow pack. It was extremely valuable to read, on your web page, your advisories and weather forecasts and to have up to the minute avalanche pictures, snow pits, and stability videos available.

Your scholarship program, which you generously extend to the ski patrol, will allow us to send additional staff to the International Snow Science Workshop this fall. This is greatly appreciated as this workshop is a valuable asset in our snow science training.

Also, a belated thank you to Eric for conducting a day long avalanche course during our preseason Snow Safety Refresher. Feedback from the Ski Patrol and Guides indicated that the classroom time, as well as the field session, was a great way to prepare for the season.

Sincerely,

Tom Leonard  
Ski Patrol/Snow Safety Director

One Yellowstone Club Trail ~ Post Office Box 161097 ~ Big Sky, Montana 59716  
Toll Free (888) 700-7748 ~ Phone (406) 995-4900 ~ Fax (406) 995-7103 ~ [www.yellowstoneclub.com](http://www.yellowstoneclub.com)

COOKE CITY EMERGENCY MEDICAL SERVICE  
P.O. Box 1203  
Cooke City, MT 59020

28 January 2010

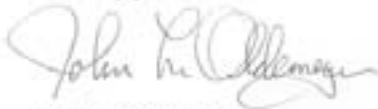
Friends of the Avalanche Center  
P.O. Box 6799  
Bozeman, MT 59771

Dear Friends:

On behalf of the Cooke City EMS I am pleased to send you a donation for \$300 to assist with your important work. Cooke City EMS especially appreciates the daily updates of avalanche conditions during the winter.

Keep up the good work!

Sincerely yours,



John L. Oldemeyer  
Treasurer

Attachment: Check for \$300



Mark,

Thank you for the great  
Presentation to The Leadership  
Bozeman Program. You are a  
great Asset to our program

Thank You!

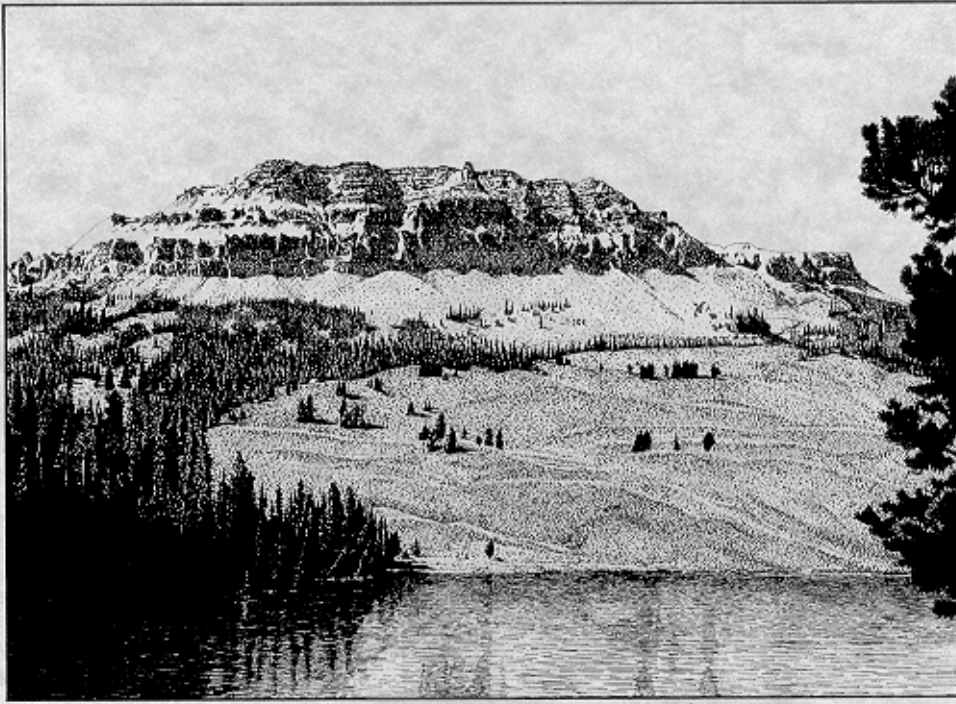
Tom M. F.

Ally Mann

Bozeman State  
Organization

Chloe Gilbert

Jody Deet



*Bentall Plateau, on the Montana-Wyoming border*

Jay,

January 2010

Thank you so much for the wonderful avalanche awareness presentation! I am excited that we were able to bring in a good audience - I am hoping that will translate into requests for your other training workshops! I look forward to working with you in the future! Thank you again

Happy Winter!  
Raman Gibson  
School of Outreach  
UMWestern

3272 The Terrace  
Shelburne VT 05482

Friends of Avalanche Center

The enclosed check for \$175.00 is  
to be used to further Avalanche  
education — This is in honor  
of Tyler Stetson who lost his  
life in January 2008 — a  
student of Avalanche,

Sincerely,

Ava D. Ely

Tyler's grandmother

COOKE CITY EMERGENCY MEDICAL SERVICE

P.O. Box 1203  
Cooke City, MT 59020

28 January 2010


Friends of the Avalanche Center  
P.O. Box 6799  
Bozeman, MT 59771

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Keep up the good work!

Sincerely yours,

  
John L. Oldemeyer  
Treasurer

Attachment: Check for \$300





### YellowstoneVacations.com

415 Yellowstone Ave. • P.O. Box 580 • West Yellowstone, Montana 59758  
406-646-9364 • 800-426-7669 • FAX 406-646-9353  
e-mail: info@YellowstoneVacations.com • www.YellowstoneVacations.com

2/16/10

Dear Friends of the Avalanche Center,

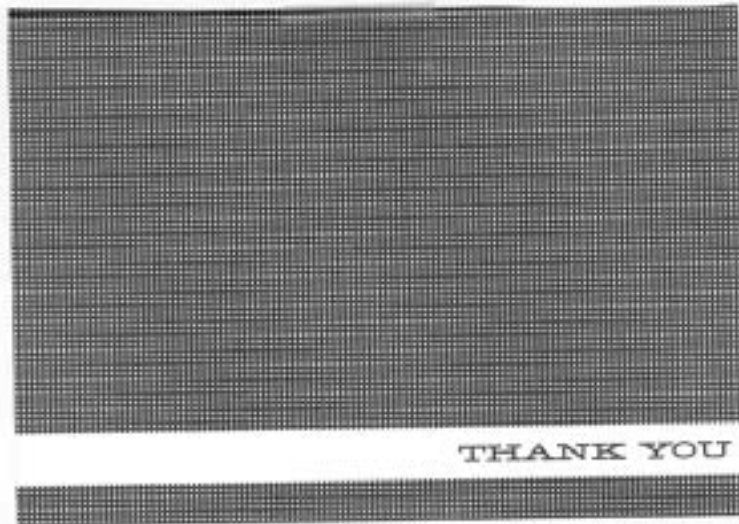
For years our company has been providing winter trips into Yellowstone on Christmas day. Over time it became our tradition to only have family work on Christmas Day, and any other employees that wanted to join us were welcome. Spending Christmas Day in Yellowstone has become so popular that we recently have been "asking" other employees and guides to work, and they have graciously responded. In appreciation of the willingness of the guides and families to work on Christmas, we have decided to donate all profits from December 25<sup>th</sup> to a variety of charities and humanitarian efforts.

Please accept this donation of \$600 from Yellowstone Vacations and our wonderful staff. We hope that it will help to develop the "Beacon Park" in West Yellowstone that we have heard so much about.

Sincerely,  
Randy & Jeanine Roberson and Family

*Beacon Park = Profit*

Rendezvous Snowmobile Rentals • Brandin's Iron Inn • City Center Motel • Pony Express Motel  
Buffalo Bus Touring Company • Big Sky Car Rentals • [SnoozechYellowstone.com](http://SnoozechYellowstone.com)



Dear Doug Charbot,

Thank you very much for taking the time to let me interview you about avalanche safety. Your answers were very helpful when writing my paper and the multi-gauge portfolio. Also, thank you for the booklet that you gave me. I read through it and found it very interesting and helpful. I will be presenting in January on all of my research and you would be welcome to come.

Thank!



**B.W.A.G.s**  
**Bozeman, Montana**

B.W.A.G.s  
c/o Patti Steinmuller  
14665 Spanish Breaks Trail  
Gallatin Gateway, MT 59730

November 27, 2009

Gallatin National Forest Avalanche Center  
10 E Babcock Street  
Bozeman, MT 59715

Dear Gallatin National Forest Avalanche Center:

Enclosed is a check for \$100.00 as a donation to the Gallatin National Forest Avalanche Center from the Bozeman Womens' Activities Groups (B.W.A.G.s). Thank you for your service to our community.

Sincerely,



Patti Steinmuller  
B.W.A.G.s Treasurer

Enclosure



To whom it may concern:

I'd like to recognize the Gallatin National Forest Avalanche Center and the National Avalanche Center staff for all of their help and support this season. Karl Birkenland and Doug Chabot presented several informative multi-media talks at the annual Southwest Montana Ski Patrol avalanche training seminar held in Bozeman this past November. The Wet Snow Avalanche Workshop hosted by the GNFAC this March was an exceptional forum for our operation. Over the course of the year the GNFAC and NAC staff spent significant time at Big Sky and the surrounding area looking at snow and investigating avalanches. We hold regular conversations and email correspondences regarding snow, weather, and avalanches. This provides an essential outside perspective to our forecasters, Snow Safety Dept., and the Big Sky Ski Patrol as a whole. Additionally, many of our staff rely on their forecasts and advisories, for current avalanche conditions as well as a multimedia link to the avalanche community. The many backcountry days spent by our staff are a valuable activity to further our skills as avalanche workers. The GNFAC also provide a link to further our education, such as support for attending the International Snow Science Workshop in Squaw Valley CA in October this year. Thanks again to these organizations for such a critical service in our ski area operations.

Nicholas Armitage                      3-29-10

Big Sky Snow Safety Dept. Manager



Bozeman Recreation Department

P.O. Box 1230

Bozeman, MT. 59771

(406) 582-2910

Jay Page

Friends of the Gallatin National Forest Avalanche Center

PO Box 6799

Bozeman, MT 59771

Dear Jay-

On behalf of the City of Bozeman Recreation Department, I want to thank you for working with us for the Transceiver Clinic at Lindley Park. The event ran smoothly and the participants walked away happy and more knowledgeable. Both of the instructors were professional, excellent teachers, and worked well with the participants.

The event went so well that we would like to continue to work with you for next fall/winter to provide more of these clinics with The Friends of the Gallatin National Forest Avalanche Center. Feel free to call us or stop by anytime here at Beall Park. Enjoy the summer season and let's hope for a great winter next year!!

Kindest Regards,

Jenny Fiebig

MONTANA TELEMARк CORPORATION  
411 North Broadway Ave  
Bozeman, MT 59715  
406-587-6084  
pinheadclassic@gmail.com



April 7, 2010

Dear Friends of the Avalanche Center:

This year's Pinhead Classic was an event to remember! Approximately 130 telemark, AT and split board riders graced the slopes of Bridger Bowl in full costume.

We stand committed to supporting the Gallatin National Forest Avalanche Center in every way we can. Enclosed, please find a donation check in the amount of \$1,000.

Thanks for the valuable service you provide all of us year after year.

Sincerely,

Warren Bauder and Paul Neubauer  
Montana Telemark Corporation

The Montana Telemark Corporation is a 501(c) 3 Non-profit Organization. Tax ID# 81-0454925

## ARTICLES

E.E. BYG BRY PUBLISHING, NOVEMBER 20, 2009

CARVE

# FATAL CONSEQUENCES

## Lessons learned from a decade of avalanche fatalities

Snowfall in the first days of October brought out finished skiers dozing with hunger for powder. They skied, hit rocks and even triggered a few avalanches. A 2-foot snowstorm three weeks later also resulted in powder runs, base trails and beavers, but fortunately, no fatalities. Early season mountaineers excited skiers about the coming winter and put smiles on their faces. But the dark side of skiing is tragedy from avalanches. People die in slides they trigger. Overall, 94 percent of fatal avalanches were triggered by the victim or someone in their party. Avalanches rarely kill uninvolved bystanders. As skiers, our fate is in our own hands.



BY DOUG CHADLER

### LAST 10 YEARS

In the United States 275 people died in avalanches over the last 10 winters, 42 of them in Montana — the annual highest avalanche death rate in the U.S. Of those deaths, 22 occurred in Southwest Montana, 14 snowmobilers and eight skiers and climbers. Looking at nationwide avalanche statistics reveals patterns invisible at the local level.

More people die in avalanches in National Forest land than from any other natural hazard, including wildfire, floods, hurricanes and landslides. In the last 10 years an average of 179 people were caught in avalanches every winter. Ninety of them were buried, 30 were injured and 28 died.

### THE AVALANCHE VICTIM

The avalanche records paint a picture of the typical avalanche victim. Ninety percent are men with most aged 25-29 years old. Women account for 10 percent of the fatalities, but the majority of them are between 40-44. Although it's obvious why mountaineers dress young men are more

likely to die, the mature female grouping is a mystery.

All but 4 percent of the avalanche deaths happened to people recreating on steep, advanced terrain. During the last 10 years backcountry skiers/snowboarders and snowmobilers are almost tied in

numbers of avalanche deaths. BE men amounted to 111 snowmobilers, a less than 10 percent difference in fatalities. Here in Montana the spread is greater because snowmobilers are more numerous.

The majority of avalanche victims are competent and experienced winter travelers. Three-fourths of them have some type of formal avalanche education. We know that education saves lives, yet it also has a nasty edge by falsely boosting our self-confidence. It takes a humble, self-reflexive person to keep our hubris in check. Accident investigations reveal that people's training lagged behind their activity skill level. In other words, their hunger for steep lines and deep powder exceeded their knowledge of avalanches.

### THE AVALANCHE SPECIFICS

Avalanche accidents happen mostly in the backcountry. In the U.S. there's a growing trend to access the backcountry through developed ski resorts. An astounding 52 percent of skiing and snowboarding accidents happen within 2 miles of these developed areas, although it's unclear how many were using lifts at the resort. Regretful, idyllic scenery has concentrated tracks from heavy use. Ease of access and limited gear (no skins or touring bindings needed) seduces folks lacking the necessary backcountry travel skills into serious avalanche terrain.

About 95 percent of fatal avalanches are



PHOTO COURTESY GALTHERY/PAUL FORREST PHOTOGRAPHY CENTER  
Snowmobilers search for an avalanche victim on Green Butte near Cooke City in January. The trapped snowmobiler was killed in the slide.

slab avalanches which have a tendency to fracture once a person is well onto the slope. Slabs break like a pane of glass, all at once, offering limited or no chance of escape. Most fatal slides are small to medium size, with 53 percent of the fatalities from slides less than 30 feet wide and 1,000 feet vertical.

### SURVIVAL

The survival of someone completely buried in an avalanche is far from guaranteed, even with a beacon. Time is the enemy. Within 15 minutes a victim who is unpaired has a 90 percent chance of surviving, but the chances plummet fast. By 30 minutes the victim's probability of living are 70 percent — no better odds than a coin toss, and at 45 minutes they drop to 25 percent.

Both skiers and snowmobilers need faith in their partner's skill at using an avalanche beacon, but even the newest and simplest models require practice. A study of recreational skiers found that if two people are beaced, one with a beacon and the other without, the person with the beacon only has a 10 percent greater chance of surviving because the average time to find someone was more than 30 minutes. A beacon in the hands of an avalanche professional and others who regularly practice, was definitely better but far from encouraging.

In addition to suffocation, avalanches can cause life threatening and fatal injuries by hitting trees, rocks and falling off cliffs. Approximately 25 percent of avalanche deaths stemmed from massive injuries.

A beaced victim's chance for survival depends not only on the length of time and burial depth, but also the type of terrain. Victims dug up alive were rescued by their partners 76 percent of the time. Only 12 percent were found by an organized rescue team, while 10 percent were self-rescued. If you leave the scene and go for help your partner will not be found within the golden window of 15 minutes. Although companion rescue gives the best chance of being found alive, those odds are still only slightly better than 50/50. Grim.

### CONCLUSIONS

Avalanche victims usually trigger the

avalanche that kills them. Of those completely buried, more die than live. Only 34 percent will ultimately survive. But partners that know how to use a beacon, practice with it and carry a sturdy shovel and probe can push the chance of living to more than 50 percent.

Even more important than gear is avalanche education. With education and practice we can learn more about avoiding dangerous terrain. Avalanches are all about timing, so evaluating when it's safe to ski or snowmobile a particular slope is essential. Yet we need to be careful since a little knowledge can lead us into thinking we're smarter than we really are.

The best route in the backcountry is to travel with solid, experienced partners, take an avalanche class and never be afraid to turn around. ♦

# SIDECOUNTRY SAFETY MYTHS

Riders, parents should never underestimate the danger lurking beyond the ropeline

Sidcountry is defined as out-of-bounds, backcountry terrain that is accessed from a ski area. The ski lifts make getting to the backcountry easier for everybody and more accessible to the uninformed, but does not provide any more safety since there is no avalanche control or ski patrol services in the out-of-bounds.

Moonlight Basin, Big Sky and Bridger Bowl all have gates that enter the sidcountry. The dangers are the same regardless of the jumping off point, but Saddle Peak outside Bridger Bowl has the most sidcountry traffic because of easy access and long, beautiful runs in full view of the lift. On clear, beautiful powder days, we have to be careful not to tie our emotions to fresh snow.



BY DOUG CHABOT

Avalanches are all about timing. Some days are safer than others in avalanche terrain. The key is to know the difference. The Avalanche Center can help you make intelligent, informed decisions through our daily avalanche advisories, but in the end it's up to you. Although we give general advice and data for mountain ranges, individual slopes require individual scouting. The advisory only provides a framework for reaching good decisions, but reaching them is, as mentioned, up to you.

To even contemplate going out of bounds, the minimum essentials are a solid, practiced partner to watch your back and create gear of a beacon, probe and shovel. Besides having a friend and some gear, it's worth knowing how avalanches work. Instead of learning this through trial and error, take an avalanche class. Check our Web site for offerings ([www.mtavalanche.com](http://www.mtavalanche.com)).

Don't base decisions about skiing the sidcountry on what's happening inside the ski area. Ski areas are made safe through constant upkeep by the ski patrols. Cornices get shored, wind drifts blown up, rocks marked and warning signs posted. The sidcountry is different, even if on the surface it may look the same. Here are some common misconceptions:

### SKI TRACKS ON A SLOPE MEANS IT'S SAFE AND WON'T AVALANCHE

Although it seems like this would be true, it's not. An avalanche needs four things: a steep slope, a trigger, a slab of snow and a weak layer underlying the slab. It's common

to think that if a slope gets enough tracks the weak layer gets chewed up and loses its uniformity and ability to avalanche. Weak layers can form at the surface and get buried deeply, thereby being preserved and unaffected by former ski tracks. At times a supportable hard slab will allow carving steep lines without consequence, but a thinner spot, usually found around rock outcrops, trees or near the thunks of slopes, will give away and propagate a fracture pulling out all previous tracks. That's why tracks are an unreliable indicator of stability. Many people have been fooled by this, including experienced avalanche pros. There are many ways to determine whether or not a slope is safe, but tracks on a slope is not one of them. Experienced skiers examine the weather and snowpack very carefully and do not blindly follow what others are doing.

### THE PATROL WOULDN'T KEEP THE BOUNDARIES OPEN IF IT WAS DANGEROUS

The gates are a de-facto railroad and they are always open to all ages and all abilities. The ski patrol is concerned with conditions inside the boundaries, not outside. It's always more dangerous in the backcountry because it's uncontrolled and unpatrolled. The decision to cross through the gate into the unpatrolled backcountry is yours alone, as it should be. You're free to make your own decisions and to face your own consequences.

### SKI PATROLS DO AVALANCHE CONTROL OUT THERE

This is an urban myth. It is untrue that someone knows someone who talked to someone who's buddy is on ski patrol who told them they control the sidcountry. This is false. It is ALWAYS false. Ski patrols do not do any avalanche control outside their permitted boundaries. Ever. Period.

### "I CARRY MY OWN GEAR, I'M SAFE, I WON'T GET INTO TROUBLE"

This carries weight if it's just you and your partner skiing safely all alone. But sidcountry skiing has unique problems typically never encountered in the backcountry—namely other skiers. Skiers dropping in above others put elevated risk on those below. No one ever plans on triggering an avalanche, but releasing a slab carries extra consequences for those down slope. It's one thing to personally pay the price for your mistake, quite another to have someone else pay it. Skiing above others is a hazard mostly unique to sidcountry.



ERIC WILSON

A backcountry skier skis up The Ramp from Bridger Bowl's north boundary access gate.

Adults are (usually, in theory, by definition) equipped to make informed decisions regarding their lives and safety. They can drink, go to war, vote and basically do whatever they want (provided it's legal). Young adults are not so equipped. Parents sign release forms, chaperone, have curfews and set rules outside of the legal system to provide guard rails on their children's roads. Death and serious injury should not be part of the young adult learning curve, yet skiing the sidcountry is serious business. That's why parents need to make informed decisions regarding the complexities of sidcountry skiing. The Avalanche Center and Bridger Bowl made a 10 minute video last year titled "Stay Alive." If you're unfamiliar with the sidcountry it's a good place to start. If your kid has a beacon and shovel to ski the Ridge, do not assume they will stay within the ski areas. Outline your expectations clearly. Traveling in the backcountry carries great risk and personal responsibility. Every year adults die in avalanches. We do not want to see teenagers die in them as well. ♦

Doug Chabot is the director of the Gallatin National Forest Avalanche Center. He can be reached at [dchabot@gnfc.com](mailto:dchabot@gnfc.com).



## ARE YOU READY FOR AN AVALANCHE?

Training can help you keep a cool head when backcountry conditions turn south

I can't believe this is happening. I watch my friend ski a beautiful line, but the slope avalanches in slow motion. It swallows him from behind and I can't see him. I scream, "Avalanche!" but I don't know if he heard me. He's buried. I know it.

Have you, dear reader, given this scenario some thought? Have you wondered about what to do to turn the tide of a really bad situation around? Call for help? If there's a group, do your ski out to sound the alarm? Answers to such questions are not easy, but thinking and practicing bad decisions like this happens out there when reality comes unexpectedly knocking.

This happened to me once. I saw my partner get hit and disappear from view. I took a few breaths and told myself that it was Game Time. I know what had to be done because I had trained years for this moment. First, I let a few seconds pass to calm myself. This is a technique taught in Wilderness Leadership classes, the military and in professional rescue work: a few seconds of focused calmness blocks panic from taking charge.

Now it's time for the business of clear action.

I first assess scene safety because a dead rescuer can't help. I confirm that there's no hang-fire or adjacent slopes waiting to bury me. I get out my beacon, put it on "receive" and ski down the hard bed surface to his last known point (LSP). The LSP is crucial information because I know that he is not above that point and is likely in the fall line. I run the search area down to a manageable size. As soon as I pick up the beep of his transceiver I see him, buried to his waist, yelling that he's OK. Where he lost a ski, but is fine. We're both pumped on adrenaline. We were lucky and only ripped by the Avalanche Dragon, not eaten by it.

The 15 minutes immediately following an avalanche are critical. The victim has a 90 percent chance of survival if dug up in that time. At 30 minutes the odds drop to 50-50. After that they diminish quickly.



Searchers comb through a massive debris pile which killed a snowmobiler near Cooke City last January.

Because of these time constraints it's imperative that everyone stays to help, no matter the group size. It's an All-Hands-On-Deck situation without exception. If one person is buried, then one person will do the manual beacon search. Everyone else must turn their beacons off to not interfere with the search. This is common sense and sounds simple, yet is regularly missed. Last winter a young man and his dad snowmobiled to an avalanche on Mount Jefferson. They stopped at the toe of the debris and immediately recognized a problem: the person doing the beacon search had his head down walking in circles. He was following the guy in front of him who forgot to turn his beacon off, a rookie mistake. The young man had done rescue drills in one of our avalanche classes and knew how to fix the problem. He ran up on the debris, turned the guy's beacon off and instructed his dad to follow him with a shovel and probe as he completed the search. Although the victim was located soon after, he was buried too deep to rescue.

With one person doing the beacon search, at least one other should shadow him with a probe pole and shovel ready for action. Others should also have their shovels and probes out, actively searching the debris for clues. Many people are alive today because a rescuer saw a glove, gave it a yank and found a hand attached. Years ago in West Yellowstone a snowmobiler was found by the thin ice of his new boot sticking out of the snow. And a wife found her husband when she saw his hand hidden behind a snow block, invisible to everyone above. Spot pushing

above trees, in debris piles, around clothing or helmets can only help because sometimes we get lucky. The clock is ticking. Everyone needs to be searching.

Once the primary searcher gets a beacon signal he should start yelling out his digital display reading, "30, 25, 20" as he gets closer to the buried victim. Folks should congregate around him, ready to dig hard and fast. When he reaches the lowest numbers, it's time to probe. Probing locates the person with precision; there's no chance of missing by inches. Leave the probe in the snow after a strike to not lose the location in the fury of shoveling.

Only after the victim is uncovered, ideally alive, will you contemplate sending folks out for help. An exact location, description of injuries and situation should be written down and sent out because Search and Rescue depends on it.

Getting caught and buried in an avalanche is often fatal, usually the culmination of compounding mistakes. Avalanche rescue is a last resort to save the day, but it doesn't always work. Not needing a rescue in the first place is what we strive for. Assess the snowpack carefully and play conservatively if there are any doubts about the stability. Practice and be prepared for a potential avalanche nightmare, and make sure the people you regularly ski or ride do the same — your life depends on them knowing what to do. ♦

Doug Chabot is the director of the Gallatin National Forest Avalanche Center. He can be reached at [dchabot@gnfc.fs.fed.us](mailto:dchabot@gnfc.fs.fed.us).



BY DOUG CHABOT

# CHRONICLE

Serving Sawtooth Montz

FRIDAY, NOVEMBER 13, 2009

DAILYCHRONICLE.COM

## Snow happens

STORY BY JOHN MAUSER • PHOTOS BY SEAN SPURRY AND NICE MOUNT



# Snow/ from Page A1

"It's not unusual to get snow this time of year, but the intensity of the storm is," Oh said.

The storm took its toll on area drivers. Montana Highway patrolers responded to more than 70 motor vehicle accidents between late Wednesday and 5 p.m. Thursday in Gallatin, Madison, Broadwater, Meagher and Park counties. Sgt. Steve Wisniewski said.

"It seems like a first snow day all over again," he said. Most of the crashes resulted in minor or no injuries, Wisniewski said.

"Because of the weather, people tended to drive slowly so there was nothing really serious or fatal," he said.

Many of the crashes also yielded traffic tickets, Wisniewski said. One man was stopped for driving 103 mph on U.S. Highway 287. He was also driving drunk.

The city of Bozeman released a statement Thursday afternoon that described driving conditions on city streets as "poor" with visibility less than a quarter of a mile.

Five plows and four graders were out removing snow from city streets Thursday, but officials asked people to refrain from driving unnecessarily. They also requested people try to park in driveways and off streets whenever possible to make it easier for the snowplow drivers.

As for those headed for the slopes, folks at the Gallatin National Forest Avalanche Center stressed that with snow comes avalanche danger.

"There's more than enough snow right now for an avalanche," said Mark Staples, avalanche specialist. In fact, a storm that dumped several inches of snow in the mountains the last week of October produced several slides — natural and human-triggered, Staples said. Skiers were caught in two of those.

One massive slide cragged three skiers about 300 feet down Granite Peak in the Tobacco Root Mountains on Oct. 31. Another, smaller avalanche caught a lone skier in the Bridger Mountains that same weekend. None of the skiers were seriously injured, and that's because they were lucky, Staples said.

Although the center typically doesn't begin posting daily avalanche forecasts until sometime in December, big snow events like Thursday's will spawn a bulletin.

Staples advised those heading out be prepared with proper gear, including shovels, transceiver, warm clothes, water and especially a partner.

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## Bozeman slows down as snow comes down

**A** snow machine to hit the slopes at Bridger Bowl this weekend might want to dig out the climbing skins, a backpack and a transceiver because, despite a dump of more than 2 feet of snow Thursday, the ski area will not be opening.

"This is good snow though," Doug Wales, the ski area's public relations director, said Thursday. "With its high water content, it makes for a good base. It is getting us off in the right direction."

As of 2 p.m. Thursday, Bridger reported 1.5 inches of new snow over a base of 33 inches at the top of the Bridger lift, Wales said. The mountain is scheduled to open Dec. 11.

By 11 a.m. Thursday the National Weather Service had received reports that a foot of snow had fallen in downtown Bozeman, meteorologist James Oh said.

And by late morning — as the heavy, wet snow kept coming down — the weather service had extended its winter storm warning from Thursday evening to midnight.

"It could easily go above 2 feet in the mountains," Oh said.

Snow in November is nothing new in Southwest Montana, he said, but a storm of this caliber is not-worthby.

(More Snow, Page A10)



Check out more wild winter weather photos at [www.dailychronicle.com](http://www.dailychronicle.com)



Crews work to knock snow from the stop lights on Main Street on Thursday.

SUNDAY, NOVEMBER 15, 2009

OUR OPINION

# Coombs blazed the path for Montana

**N**ews that former Montana State University skier Doug Coombs is to be inducted into the Ski and Snowboard Hall of Fame might have met with more than a few shrugs from recent Montana transplants.

Sounds like just another hall of fame in an over-hyped world.

But Coombs' death in a 2006 skiing accident in Europe and the recognition he is set to receive next April in Colorado recall a singular role that southwest Montana played in the history of cutting-edge skiing.

Coombs, a Massachusetts native, competed with the Montana State University ski team in the late 1970s and then went on to pioneer many extreme skiing techniques at Bridger Bowl that are commonplace today but were unthinkable at the time.

Coombs and fellow MSU student Scott Schmidt, both of whom went on to international notoriety in the sport of extreme skiing, stretched the limits at Bridger, a ski area that has its own place in U.S. alpine skiing history.

Established through the efforts of volunteers, the first lift was put in place in the mid-1950s. Today Bridger draws skiers from around the nation who are seeking the area's uniquely challenging terrain — terrain that fostered a highly inventive ski patrol that developed avalanche-control techniques used the world over today.

Back then, Coombs and Schmidt numbered among the select few who excelled at the nascent sport of extreme skiing. But the ground broke by these and other local skiers helped set the stage for an explosion in backcountry skiing in the ensuing years.

The growing number of recreationists looking for new challenges in the backcountry prompted the creation of the Gallatin National Forest Avalanche center, which, for some 20 years, has been monitoring snow conditions in area mountains and issuing daily advisories in an effort to minimize avalanche injuries and fatalities. And the center's research continues to help establish new avalanche-safety practices.

Today, extreme skiing is more than a sport. It's a major industry of films, equipment and adventure travel.

Due to the outside-the-envelope daring of locals like Coombs, Schmidt and many others, Southwest Montana has a prominent place in the development of the sport.

BOZEMAN DAILY  
**CHRONICLE**

# AVALANCHE 101

## Answers to common avalanche questions

*"Take the attitude of a student, never be too big to ask questions, never know too much to learn something new." - Og Mandino*

Last year the GNFAC taught 62 avalanche education classes to more than 4,300 people in Southwest Montana. Grade school and graduate students, skiers and snowmobilers, search and rescue groups, ski patrols, Rotary clubs and businesses attended classes, all there for the same thing — to learn about avalanches. During Q&A sessions many people asked questions. Here's an attempt to answer the most common ones.



BY DOUG CHABOT

**Do my partners and I need the same type of beacon, or will different brands work together?**

All avalanche transceivers work on the same frequency of 457 kHz. All brands are compatible.

**Don't ski tracks on a slope mean it's safe?**

Ski tracks on a slope give a false sense of security. Many people have been caught and killed in avalanches on heavily tracked slopes. In order to avalanche, a slope must be steeper than 30 degrees, have a slab of snow over a weak layer and, finally, a trigger. If a person cuts an unstable spot on the slope it can initiate fractures which will propagate outward avalanching all previous tracks. A uniform weak layer buried deep in the snowpack can fail and create a slide, no matter how chopped up the slab above it is.

**If a slope has previously avalanched, is it safe with new snow on it?**

The simple answer is no. Weak layers are not easily destroyed, and new snow would only rebury this layer creating instability and future avalanches. A few years ago another forecaster and I were in the middle of an avalanche cycle in the Cooke City area. We investigated a few slides and that night it stormed. In the morning I skied onto a 30-degree slope that appeared unscathed, but I found the freshly buried crown indicating it avalanched yesterday. I called my partner over since I figured the slope was safe. As we dug our pit the

### CARVE

entire slope cracked and moved a few inches right at the pit wall. The weak layer was still there, as unstable as ever, and we were lucky the slope didn't avalanche again.

**Is a slope more stable after it collapses or "whumps"?**

The "whumps" we hear and feel are buried weak layers collapsing in the snowpack. When they collapse but don't avalanche it doesn't mean we're good to go. Slopes have avalanched after collapses. Two years ago a Montana ski patroller got a large slope to crack 1 1/2 inches wide with explosives, but it did not avalanche. Another shot was placed in the crack moments later and the entire slope released. Treat slopes that have fractured or collapsed with caution. They may not be safe and should not be trusted.

**Can I ski out of an avalanche by aiming toward its edge?**

If the slide is small and you're at the top when it breaks and you're an expert and your bindings don't release and your skis are pointed toward the side — maybe, just maybe you can ski out of danger. But maybe isn't definitely. An avalanche can accelerate to over 80 mph in seconds, too fast to outrun. If caught in an avalanche, something has gone terribly wrong. Even with a perfect plan, expert ability and a cool head, once caught, unmanageable forces strongly influence life or death.

**What should I do if I get caught?**

Try and stay upright and ski out of it, because sometimes luck smiles brightly on us. Failing that shnd poles and get rid of skis. Try and slow down by digging into the bed surface if possible. The best chance of survival is being near the tail of the slide since there's less snow for burial. It's also recommended to try and log roll off to the side. This technique has worked on occasion. The worst place to be is in the leading edge where the slide is the most turbulent and violent. Fight, swim, pray, and never give up. As the slide decelerates and starts to compress try and sweep one hand in front of your face to create an air pocket while using the other to reach out of the snow so rescuers can find you quickly. If uninjured, a buried victim has a 90 percent chance of surviving if dug up within 15 minutes.

**Do avalanche airbags work?**

Avalanche airbags definitely work at keeping people alive. By pulling a rip cord on the air bag pack, a colorful balloon inflates. Although it will not "float" the wearer to the surface, it increases the odds that a piece of the balloon will be visible, negating a timely beacon search. Airbags are not a replacement for avalanche beacons. ♦

*Doug Chabot is the director of the Gallatin National Forest Avalanche Center. He can be reached at [dchabot@gnfac.com](mailto:dchabot@gnfac.com).*



GALLATIN NATIONAL FOREST  
AVALANCHE CENTER PHOTO

Investigating a 7-foot deep avalanche on Buck Ridge.



# BOZEMAN DAILY CHRONICLE

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FRIDAY, DECEMBER 11, 2009

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## Hyalite avalanche kills world-class ice climber

By JODI HAUSEN and KARIN RONNOW  
Chronicle Staff Writers

World-class Canadian climber Gay Lachelle died in an avalanche Thursday morning while participating in an ice-climbing competition in Hyalite Canyon.

"He was climbing up a small gully and a boom above him triggered a small avalanche," Doug Chabot, director of the Gallatin National Forest Avalanche Center, said. "He wasn't swinging the tools when it happened, it was just an avalanche. A small pocket of snow pulled out and caught him. It hit him and took

him off the cliff, down the ice." Lachelle, 54, died of blunt-force trauma, Gallatin County Deputy Coroner Dan Springer said. The accident occurred near Grotto Falls between 9 and 10 a.m.

"From an avalanche perspective, it's a reminder that even small avalanches can have huge, deadly consequences," Chabot said. "It was just one of those things. It doesn't take much to knock you over in that steep terrain."

Lachelle's body was retrieved by a Gallatin County Search and Rescue crew Thursday afternoon. He is survived by his wife, Marge Lachelle.

Lachelle, who lived in Prince George,

British Columbia, with his wife and their dogs, was in Bozeman this week to participate in the Bozeman Ice Festival, teaching clinics in the Hyalite Canyon south of Bozeman, the most concentrated natural ice venue in the lower 48 states, according to organizers.

(More Avalanches, Page A8)

Gallatin County Search and Rescue members leave the Grotto Falls trailhead to recover the body of an avalanche victim on Thursday.



SEAN SNEYDY/CHRONICLE

## Avalanche/ from Page A1

The slide occurred during the Ice Breaker competition, which is held in conjunction with the festival. It involves pairing a local climber with a non-local to climb as many routes in Hyalite as possible in a single day. In the inaugural Ice Breaker in 2007, Lacelle and Ross Lynn took the men's title, climbing 13 pitches in nine hours.

This year, Lacelle was climbing with local guide Adam Knoff, who was not injured in the avalanche.

Lacelle was considered one of the world's leading ice climbers and was a regular on the ice-festival circuit, competing as well as teaching.

Lacelle "was one of the foremost climbers in the world," yet remained unassuming, said organizer Greg Caracciolo of Northern Lights Trading Company. "He was a super nice guy. You would never know he climbed the way he did."

"He just loved to climb and was really damn good at it," Chris Naumann, former Barrel Mountaineering owner and festival organizer, said Thursday afternoon.

Ten years ago the Banff Centre for Mountain Culture honored him with the Bill March Summit of Excellence Award, recognizing his "uncompromising standards and his pioneering spirit."

"He differs from other leading ice climbers in that he climbs almost exclusively solo and in remote locations which are difficult to access, adding to his level of commitment," Bernadette McDonald, director of The Banff Centre, said at the time.

Lacelle was born in Hawksbury, Ontario, and started rock climbing, then ice climbing while earning a physical education degree at the University of

Ottawa in the 1970s, according to the Banff Centre's biography. "His first ascent was the 300-foot La Congelée outside Québec City, which he accomplished with his partner in seven hours – a climb he has since done solo in less than five minutes."

After graduating in 1978, Lacelle led winter classes for Ontario Outward Bound, and later for Yamnuska Mountain School in Canmore, Alberta. Ten years later, he shifted gears and began spending summers working in the forestry industry and winters rock/ice climbing.

"His peers call this quiet, unassuming athlete, who is known for his physical and mental endurance, one of the world's smoothest ice technicians," the Banff Centre wrote.

His notable ascents included: the first solo link of the Terminator/Sea of Vapors and the Replicant in five hours; Weeping Pillar and Polar Circus in a day; French Maid, Curtain Call and La Pomme D'or in Quebec; Au-delà des Ombres in France; and Hydnefossen in Norway. He won the Festivals Competition in Québec in 2004, and the ice competition in Ouray in 2000 and 2001.

Solo climbing is considered the "most pure and dangerous form of climbing," according to *Alpinist* magazine, which published an interview with Lacelle in 2008.

Lacelle said in that interview that solo ice climbing "satisfies a need deep inside of me that cannot be solicited in any other way. It helps me feel more confident in my daily life."

He also said physical and mental endurance, patience and leaving little to chance kept him safe over the years.

He was also asked in that interview, "Do you ac-



GALLATIN NATIONAL FOREST AVALANCHE CENTER

**World-class ice climber Guy Lacelle was hundreds of feet above Silken Skain Falls when he was swept over this ice cliff by an avalanche on Thursday.**

cept death as an outcome of free solo climbing?"

He replied: "I would say that death is a possible outcome of free soloing, but so is rope climbing and driving a car. For me death means losing the game, and I hate losing. I don't live as close to the edge as I used to do. I am a little more comfortable with keeping a better margin of safety than I used to, but I still feel most alive when soloing serious climbs."

Organizers were undecided Thursday afternoon whether Lacelle's death would change plans for the ice festival, but Caracciolo anticipated that it would go on as scheduled.

The avalanche advisory had predicted moderate danger on wind-loaded slopes in the south Gallatin and Madison ranges this week. Thursday's

conditions were created by strong winds over the past few days that "clearly loaded some of those deep gullies with wind slabs," Chabot said.

But that should not be a factor during the festival events.

"The rest of the weekend is clinics," he said. "Where the clinics happen, there is no avalanche danger."

The difference between Thursday's competition and this weekend's festival is that the competition involved "some of the strongest climbers going for it, climbing really hard things. That's not what's going on this weekend."

Naumann said the usual reaction to an event like this is that "Guy would have wanted us to climb and be thankful for another day in the hills."



## Snowfall great for skiers, but not drivers

**BRETT FRENCH** Of The Gazette Staff | Posted: Wednesday, December 23, 2009 11:55 pm

Skiers and snowboarders rejoice!

A Canadian storm front dropped snow across Montana on Wednesday, adding to an already substantial snow base for holiday vacationers.

"We've been getting 2- to 3-inch drops really regularly for the past eight, nine days," said Dax Schieffer of Big Sky Resort south of Bozeman. "This morning 5, 6 inches fell and it's still snowing."

Red Lodge Mountain Resort received 2 inches and Bridger Bowl counted 3 inches on Wednesday. The storm was expected to dissipate by this morning, leaving behind wind chills to minus 15 in Billings under clear skies.

The most difficult chore for recreationists may be reaching the ski hill or mountains. The Montana Department of Transportation was reporting snowy and icy roads across much of the western half of the state. The same conditions, with the added problem of blowing snow, were hampering travelers in parts of Eastern Montana.

The National Weather Service recorded a 5.9 inches of snowfall at its Billings offices. Hobson and Seobey shared the state high, with 6 inches. To the southeast, Ekalaka recorded 4 inches, while, to the northeast, Glendive picked up the same. Bozeman reported 2.6 inches while Great Falls and Helena each reported 2.4 inches of snowfall.

Montana's backcountry snowmobilers, skiers and snowboarders are still being cautioned that avalanche danger is considerable due to a weak snowpack.

"All the right ingredients are there to make human-triggered avalanches probable," said Mark Staples of the Gallatin National Forest Avalanche Center in Bozeman.

While the snow may be great for folks heading to the mountains, it kept law enforcement and emergency crews busy throughout the day. Billings Police Lt. RD Harper said officers responded to 19 crashes between 6:30 a.m. and 9 p.m. Wednesday, even with the department's slick-streets policy in effect all day. The policy instructs officers to respond only to wrecks that involve injury, where traffic is blocked or in which a crime has been committed. For all other wrecks, people are encouraged to exchange information, move on and contact police later.

The Montana Highway Patrol also had a busy Wednesday, responding to more than 40 wrecks in the Billings district, which covers five counties in south-central Montana. Many of them were slide-offs on Interstate 90, and no serious injuries were reported.

The Midwest will get the brunt of holiday moisture as a storm from the south collides with the Canadian front. That combined system has the potential to drop up to 2 feet of snow or more, said Matt Solum of the National Weather Service office in Billings.

"The main impacts will be in the Dakotas, Minnesota, parts of Nebraska, Iowa and Wisconsin," he said, "pretty much the entire upper Midwest."

Contact Brett French at [bfrench@billingsgazette.com](mailto:bfrench@billingsgazette.com) or at 657-1387. Gazette reporter Zach Benoit contributed to this story.





Search

## Crown Butte slides on snowmobiler

By Brett French/Gazette Staff | Posted: Tuesday, December 29, 2009 1:35 pm



As predicted, the weak mountain snowpack unloaded on a snowmobiler high marking on Crown Butte near Cooke City two days after Christmas. Luckily, the rider wasn't injured. But the size of the fracture was impressive.

According to the Gallatin National Forest Avalanche Center, the slide broke 2 to 4 feet deep and was 400 feet wide. The rider was near the top of the slide when it released and was caught in the avalanche but not buried. Smartly, his partner was watching a safe distance below.

The snow in that area contained a hard slab surface that was allowing riders easy traction on the way up. There were about 10 to 20 other tracks on the slope before it released, which emphasizes the somewhat fickle nature of such things.

As the Avalanche Center's Doug Chabot said in the daily forecast, "The take home point: Tracks do not equal stability."

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BOZEMAN DAILY CHRONICLE

# THE BIG SKY

SECTION C

SUNDAY, JANUARY 3, 2010

CITY DESK: 587-4491 OR E-MAIL: CITYDESK@DAILYCHRONICLE.COM

## Avalanche danger high in backcountry areas

By Chronicle Staff

An avalanche warning for backcountry areas in the mountains around Yellowstone National Park is in effect until 6:30 a.m. today, according to the Gallatin National Forest Avalanche Center.

"The avalanche danger is high on all slopes. Areas of unstable snow exist. Natural and human-triggered avalanches are likely," Mark Staples of the avalanche center said in Saturday's advisory.

The warning was issued for the southern Gallatin and Madison ranges, the Lionhead area near West Yellowstone, moun-

"The avalanche danger is high on all slopes. Areas of unstable snow exist. Natural and human-triggered avalanches are likely."

— Mark Staples, Gallatin National Forest Avalanche Center

tains around Cooke City and the Washburn Range in the park.

More than a foot of new snow came down on "an extremely weak snowpack," Thursday and Friday, Staples noted.

He urged people to avoid avalanche-prone terrain.

"The weak snowpack is more obvious near West Yellowstone, where recent snow resting on weak faceted snow hardly

snows, but these facets will produce avalanches," he said.

Staples said the center staff planned to evaluate the situation this morning and either extend or terminate the warning.

The avalanche danger prompted Yellowstone Park officials to temporarily close Sylvan Pass to all over-snow travel on Friday, according to a prepared statement from the National Park Service. Sylvan Pass was reopened Saturday after park employees used a howitzer to clear the danger spots and groomed the East Entrance Road.

In the northern Madison range, near Big Sky, less snow mitigated the potential for avalanches a bit,

but the danger Saturday was still rated "considerable."

In the Bridger and northern Gallatin ranges, there is also less snow, but a weak snowpack, wind slabs and faceted snow combined to create a "considerable" avalanche danger on wind-loaded slopes and a "moderate" danger on non-wind-loaded slopes.

The last reported avalanche in this region occurred at the Big Sky Ski Resort on Dec. 13, according to the center's Web site. No one was injured.

For more information, visit [www.mtaavalanche.com](http://www.mtaavalanche.com), or call the center's recorded advisory line, 587-6981.



## Billings-area snowmobiler was stuck when avalanche struck

**BRETT FRENCH** Of The Gazette Staff | Posted: Monday, January 4, 2010 6:30 am

A 33-year-old Billings man killed Sunday in an avalanche near Cooke City had apparently gotten stuck and was trying to free his snowmobile when the slide erupted, according to Eric Knoff of the Gallatin National Forest Avalanche Center in Bozeman.

The man was identified Monday by Park County Coroner Al Jenkins as Scott Paul Herren.

Members of the avalanche center are investigating the incident.

Herren was riding on the south-facing slope of 10,382-foot Scotch Bonnet Mountain near the head of Lulu Pass when the avalanche occurred at about noon, Knoff said. The snowmobiler was apparently about three-quarters of the way up the mountain when he got stuck, Knoff said.

"Apparently, there were a lot of tracks on the adjacent slope," he said. "That's kind of a false indicator that things are stable."

Scotch Bonnet is about five miles northwest of Cooke City in the Beartooth Mountains. It is a popular play area for snowmobilers and backcountry skiers. The attraction is large mountains with lots of snow that, in many places, are free of trees.

The area had received 12 to 14 inches of new snow on New Year's Day. That snow was on top of a thick slab of hard snow, but underneath a layer of unstable sugary snow had prompted the center to issue a warning for high avalanche danger in the mountains surrounding Cooke City.

"It's just a really bad combination," Knoff said.

The avalanche released snow about 2 feet deep and 100 feet wide on a slope about 35 degrees steep, Knoff said. The snow slid about 500 vertical feet.

Herren was found about 45 minutes after the avalanche occurred near the base of a tree. Attempts to resuscitate him were unsuccessful.

According to the Park County Sheriff's Office, Herren was riding with another snowmobiler when the avalanche occurred. Herren was wearing an avalanche beacon, which helps searchers locate avalanche victims.

The Sheriff's Office said the victim was found by his partner. Cooke City's emergency response team arrived by 1:16 p.m. but could not revive the snowmobiler.

The incident was the second avalanche fatality of the winter season in Montana. The first occurred when an ice climber in Hyalite Canyon area south of Bozeman was killed on Dec. 10.

Nationally there have been four avalanche fatalities this season, including the two in Montana.

Last season, 27 avalanche fatalities occurred in the United States, including three in Montana, all on Jan. 17, 2009, and five in Wyoming. Out of the 27 fatalities last year, 16 were snowmobilers.

Avalanche danger in the Cooke City, West Yellowstone and southern Madison and Gallatin ranges remains high due to the unstable snow conditions. The danger is rated as considerable in many of the other areas of southwestern Montana.

Contact Brett French at [french@billingsgazette.com](mailto:french@billingsgazette.com) or 657-1387.



## Avalanche danger remains high in wake of Billings snowmobiler's death

**BRETT FRENCH** Of The Gazette Staff | Posted: Tuesday, January 5, 2010 5:00 pm

A Billings snowmobiler killed in an avalanche on Sunday was swept about 150 feet downhill after the snow broke loose more than 600 feet above him.

"They weren't high markers. They were doing a lot of things right," said Doug Chabot of the Gallatin National Forest Avalanche Center, who investigated the incident about five miles northwest of Cooke City on Monday. The avalanche occurred at about noon on the southeast face of Scotch Bonnet Mountain near Lulu Pass.

The problem, which persists across the mountains of southwestern Montana, is that a weak layer of sugary snow is being triggered directly and indirectly by backcountry skiers and snowmobilers. The loose snow, which can act like slippery ball bearings when the snow is broken loose, is buried beneath a thick crust of hard snow.

"We have weak snow everywhere," Chabot said. "I'm expecting the danger to really spike."

The avalanche danger will be heightened by heavy snow that began falling in the mountains on Tuesday. The increased weight of the snowpack could naturally trigger avalanches, as well as increase the chances that backcountry travelers will set them off.

### Trapped by tree

Scott Paul Herren, 33, was killed in the avalanche on Sunday. According to his MySpace page, he was a graduate of Huntley High School who enjoyed many outdoor sports with a group of close friends. He was riding with one of those friends, who was below him on the slope, when the avalanche struck.

Chabot said the friend was behind Herren traveling uphill when he saw Herren get stuck in soft snow. The friend turned around and was traveling back down the slope when the leading edge of the avalanche caught up to him, lifting the rear of his snowmobile, he told Chabot. Luckily, he was able to outrun the slide.

After the accident, the friend found where Herren was buried within about five minutes using an avalanche locator beacon, which both riders were wearing. But Herren's abdomen was wrapped around a tree about 2 to 3 feet under the snow. Digging him out was made more difficult by the tree's branches. Two other riders heard Herren's friend yell for help and assisted, but it was about a half-hour before they reached Herren, Chabot said.

Even before Herren was freed from the snow, the snowmobilers tried to revive him using CPR.

### Avalanche terrain

The avalanche broke 2 feet deep and 75 to 100 feet wide, Chabot said. It slid about 1,000 feet down the slope, or 500 vertical feet. The slope angle was 35 degrees. Avalanche terrain is considered anything above 30 degrees.

Others had been riding on the same slope before the avalanche broke loose. Where Herren got stuck was at the base of a much steeper slope.

"As long as the slope is connected to a steeper slope, it's dangerous," Chabot said.



## Avalanche warnings issued in Montana

Associated Press | Posted: Wednesday, January 6, 2010 11:15 am

BOZEMAN — Avalanche warnings have been issued for the mountains in southwest and west-central Montana as heavy snow fell on weak snowpack.

The Gallatin National Forest Avalanche Center has issued a backcountry avalanche warning for all of its forecast area: the Bridger Range, the entire Madison and Gallatin ranges, the Lionhead area near West Yellowstone, the mountains around Cooke City and the Washburn Range in Yellowstone National Park.

Doug Chabot says he does not believe the center has ever issued a warning for its entire forecast area.

Steve Karkanen with the West Central Montana Avalanche Center says the avalanche danger is high at elevations above 6,000 feet in the Bitterroot, Rattlesnake, Southern Swan and Mission Mountains near Seeley Lake.

MSA - JANUARY 2010

## Preparation and Execution Tips for a great season in the Backcountry

BY ERIC KNOFF  
Gallatin National Forest  
Avalanche Center

Heading out for a day in the hills is easy and rewarding unless we overlook a few simple preparations that if not practiced routinely can result in drastic consequences.

First—Being prepared starts at home. Make sure your equipment is operating correctly. One often overlooked detail is the lifespan of your avalanche transceiver batteries. Replace them at the

start of every winter season, no matter how much use they received the previous winter. Know how to check the transceiver battery power, and when it drops below 50% change them. Never use rechargeable batteries in a transceiver due to the fact they wear out quickly and do poorly in the cold. In addition, an avalanche shovel and probe always accompany your transceiver. Make sure these important rescue tools assemble properly and did not get damaged during their long hibernation in the gear closet. Before heading into avalanche terrain do at least an hour or two of avalanche transceiver practice with your backcountry partners. Being familiar with all your equipment before you leave the house is a great way to ensure you make it home for dinner.

Gathering important backcountry information only takes a minute and is easily done at home. Know the phone number and website

address of the local avalanche center. Stay updated on current local avalanche and weather conditions. Check the schedule of avalanche education classes offered in your community. Take at least one course geared toward avalanche education and safe backcountry travel.

Second—Preparation continues at the trail head. Communicate with your partners and make a plan for that specific day. This plan should be made around each individual's riding ability and from the information you received at home concerning weather and avalanche conditions. Know if the area you are riding in has cell phone coverage and which member of the team is carrying a cell phone. Communication between partners is often overlooked and can play a huge role in the outcome of the day.

When a plan has been made and everyone is comfortable with the agenda a transceiver check on every member needs to be conducted. This procedure is simple and only takes a minute. Turn all transceivers to transmit. One member then turns their transceiver to receive and checks for the loud beeping and blinking lights as he gets close to each individual. After transceivers have been turned on and checked they are strapped to the body under at least one piece of clothing. They are always turned on and applied at the car and never go into packs or on the outside of riding apparel. Other

equipment checks on probes, shovels and first aid kits should also be done at the car.

Third—Use your preparations and knowledge to make it a safe day on the slopes. Terrain recognition and good route finding are essential skills for backcountry travel. When traveling on benign or non-avalanche terrain, it is important to pay attention to private property and wilderness boundaries. Crossing these boundaries can result in a closure of the trail, a stiff penalty or both. Deep snow may make it difficult to recognize exact boundaries, but good map study and terrain recognition can help determine a safe and legal route.

Venturing into avalanche terrain requires clear communication and a team mentality. Exposing one rider at a time on avalanche prone slopes is imperative. Putting more than one rider on a slope dramatically increases the chance of triggering an avalanche. With one rider on the slope, the rest of the team needs to be in a safe zone with an unimpeded view of the rider at all times. This will allow a rapid response in case an avalanche does occur. Recognition of potentially dangerous slopes, terrain traps and islands of safety become an integral part of traveling in avalanche terrain.

Weather influences daily planning and preparations. Rapid weather changes can rapidly change

the stability of the snowpack. Consistent observations of temperature, wind direction and precipitation should be routinely noted. It does not need to be snowing for the avalanche hazard to be increasing. Strong winds can load slopes quickly making them unpredictable and dangerous. Staying focused and aware of your surroundings will allow you to make safe decisions throughout the day.

Applying simple preparations to a well tuned baseline of skills is an effective way to ensure a safe and fun backcountry experience.

### Avalanche Center Information

Gallatin National Forest Avalanche Center (GNFAC), Bozeman, MT  
Website address – [mtavalanche.com](http://mtavalanche.com)  
Observations – 406-587-6984  
Advisory – 406-587-6981

The West Central Montana Avalanche Center, Missoula, MT  
Website address – [mis-soulaavalanche.org](http://mis-soulaavalanche.org)  
Observations – 406-329-3752  
Advisory – 406-549-4488

Glacier Country Avalanche Center, Kalispell, MT  
Website address – [glacier-avalanche.org](http://glacier-avalanche.org)  
Advisory – 406-257-8402

BOZEMAN DAILY CHRONICLE

# THE BIG SKY



CITY DESK: 587.4491 OR E-MAIL:  
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## Meeting looks at Saddle Peak avalanche

By Chronicle Staff

The Gallatin National Forest Avalanche Center will hold a public meeting Thursday to discuss the conditions and circumstances that led to the massive, mid-February avalanche on Saddle Peak in the Bridger Mountains.

The avalanche occurred at about 11 a.m., Feb. 16, triggered by a skier. No one was killed in the slide, but the size of the avalanche and its proximity to the

Bridger Bowl ski area – just south of the boundary, in the national forest – underscored the fact that even areas that are heavily skied can be dangerous.

At Thursday's meeting, avalanche center staff will show videos and photos and share stories about this popular "sidecountry" destination, said Doug Chabot, the center's director.

"Sidecountry is defined as out-of-bounds, backcountry terrain that is accessed from a ski area," according to the

avalanche center's Web site.

"The close proximity to a ski area makes accessing these areas easier, but does not provide any safety as there is no avalanche-hazard reduction or ski patrol services."

The meeting begins at 6:30 p.m. in the Bozeman Public Library meeting room. It is free and open to all ages.

Topics to be covered include:

- A detailed history of the snowpack and avalanches.
- A weather summation.

■ A timeline of the day of the avalanche.

■ Details as to what occurred that day on the mountain.

■ Moving forward: making decisions for the future

The 30-minute presentation will be followed by a 30-minute question-and-answer period.

This winter, two people have been killed in five other avalanches on the Gallatin, beginning in late October.

For more information, call the center at 587-6984 or e-mail [mtavalanche@gmail.com](mailto:mtavalanche@gmail.com)

# CHRONICLE

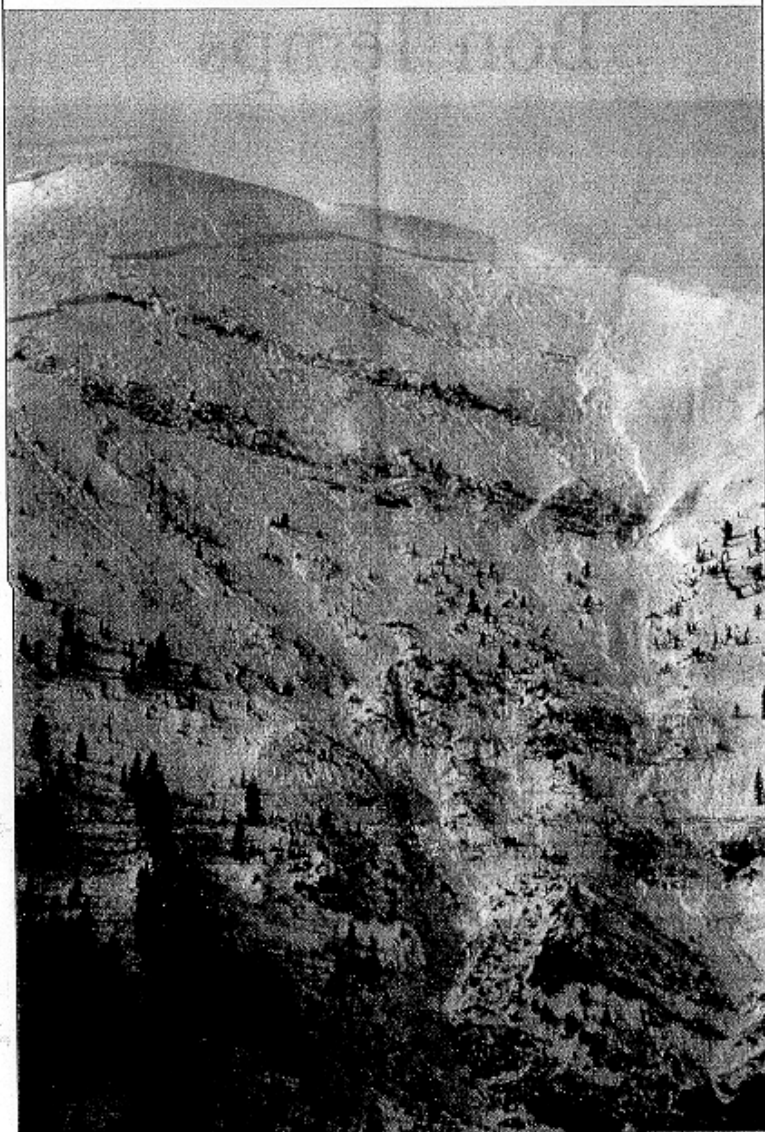
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WEDNESDAY, FEBRUARY 17, 2010

Serving Southwest Montana

## DOWNHILL SLIDE

Massive avalanche roars down Saddle Peak



SEAN SPERRY/CHRONICLE

A fracture line curves around Saddle Peak after a skier triggered a large avalanche in the Bridger Range on Tuesday. Gallatin County Search and Rescue responded to the avalanche. Nobody was buried in the slide despite the popularity of the peak for



## Search and Rescue responds; no injuries reported

By **MICHAEL GIBNEY**  
Chronicle Staff Writer

A skier on Saddle Peak triggered a massive avalanche Tuesday morning, prompting 40 volunteers with Gallatin County Search and Rescue, with snowmobiles and a helicopter, to search the area for people caught in the slide.

No one was reported missing in the huge avalanche, and witnesses did not see anyone get caught in the slide. The search was ended around 3 p.m. for fear that rescue workers could trigger another avalanche, Gallatin National Forest Avalanche Specialist Doug Chabot said.

Skiers at Bridger Bowl could see the large avalanche, which occurred just south of the ski area at 11:10 a.m., according to Doug Wales, marketing director at Bridger Bowl.

The avalanche “went to the ground and ran close to 2,000 vertical feet down the mountain,” Wales said.

He said a skier was standing on the slope when a “van-sized cornice” dropped from underneath him, triggering the slide. The man did not get caught in the avalanche, Chabot said, and was not injured.

Chabot attributed the slide to two-and-half feet of new snow over the weekend as

well as wind loading, which led to unstable conditions.

“We’ve had some nice days, and there were hundreds of tracks on the slope,” Chabot said. “People sometimes think that means it’s stable, but it’s not necessarily true.”

The avalanche advisory for Tuesday, prepared by the Gallatin

National Forest Avalanche Center, said avalanche danger for steep slopes like Saddle Peak was “considerable,” and warned that “natural and human triggered avalanches were rampant” in the Bridger, Madison and Gallatin mountains due to snow that fell over the weekend.

Saddle Peak is outside Bridger Bowl’s ski bound-

aries on National Forest land. However, many skiers and snowboarders hike to the area from the top of Bridger’s Schlasman’s Lift, an expert only lift. Bridger Bowl requires riders of the lift to have avalanche transceivers.

Chabot said the skier who triggered the slide had ridden the lift up, and was “one of the first on the summit.”

Several skiers and snowboarders aided in the search effort.

*Michael Gibney can be reached at [mgibney@dailychronicle.com](mailto:mgibney@dailychronicle.com) or 582-2638.*

**The avalanche “went to the ground and ran close to 2,000 vertical feet down the mountain.”**

— Doug Wales,  
Bridger Bowl

## Center answers questions about Saddle Peak slide

By **MICHAEL GIBNEY**  
Chronicle Staff Writer

A group of about 200 community numbers attended a meeting held by the Gallatin National Forest Avalanche Center on Thursday night for information regarding the Feb. 16 avalanche on Saddle Peak.

Doug Chabot, director of the Avalanche Center, addressed the brimming room, describing the events leading up to the avalanche with videos and photographs.

"It was a huge avalanche and a near miss," Chabot said of the slide in which no one was killed. "Now we need to dissect it and learn from it."

(More **Avalanche**, Page C2)

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## Avalanche/ from Page C1

He said a snowy autumn began the series of events, compounded by a cold snap in December. The snowpack and the frigid weather led to the formation of weak snow facets, or fault lines, on the slope.

Late December winds then placed a dense slab over the weaker snow, making the slope unstable in many parts, but it was still not affected by skiers, he said.

By late January, Chabot was "getting calls almost everyday" and the Avalanche Center issued a warning over their entire covered area, the first time they had ever done so.

In the middle of February, snow and rain rapidly added weight to the slope.

The slide occurred after a sunny Feb. 15, during which many skiers were hiking the ridge and "laying tracks like you wouldn't believe," Chabot said.

The day of the avalanche, a skier triggered a van-sized cornice to fall and create a giant fracture in the weak snow, which immediately led to the slide.

Chabot gave a few safety tips, including staying in safer zones, not looking at tracks as indications of safety and relying on "bulls-eye" data in deciding whether to ski or not.

"We're not saying 'don't go ski there,'" said Karl Birkeland of the U.S. Forest Service Avalanche Center. "But make sure the conditions are right."

Randy Elliott, general manager at Bridger Bowl, said that they would not be closing the area to skiers, but asked that people "treat the peak with a lot more respect."

"You really have to know what you're doing if you want the chance to come home to your wife and kids," Elliott said.

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TUESDAY, MARCH 23, 2010

## OUR OPINION

# Stay safe during last days of winter

It's that time of year. There's a breath of springtime in the air; people feel like getting outside, and some are out to get their final dose of winter sports.

But, as some unfortunate Canadians found out earlier this month, winter is anything but over. In fact, one of winter's most lethal threats — avalanche — is anything but gone for the season.

Two people were killed in Revelstoke, British Columbia, by an avalanche at a snowmobile rally. The slide was triggered by snowmobilers who were engaging in behavior — high-marking — that can be lethal under any conditions, while some 200 spectators looked on.

High-marking snowmobilers compete to see who can reach the highest point on steep slopes, but not so steep the sleds can't climb. These are the kind of slopes most prone to avalanches. Canadian authorities said the tragedy could have been much worse were it not for the fact that many of the rally participants were equipped with avalanche transceivers and other equipment that enabled the recovery of many people who could otherwise become fatalities.

The snowmobilers were high-marking despite the fact that avalanche danger warnings had been in place for three weeks.

Now that the weather is warming up, many snow enthusiasts — skiers and sledders — will be heading to the backcountry to get those last few turns and rides in. The tendency is to begin letting down their guard as spring-like conditions prevail. But those same conditions — daily thawing, nightly freezing, brief heavy snowfalls, even rain — can create some of the most dangerous avalanche conditions of all.

We are fortunate here in southwest Montana to have the Gallatin National Forest Avalanche Center, which monitors conditions and issues advisories. If you are one of those folks that want to get out and enjoy the spring mountain conditions as a skier, snowboarder or snowmobiler, it's as important now as it ever has been to be checking with the center for the latest information.

Spring is a great time to enjoy snow sports, but do it safely. Before heading out, check the avalanche center's Web site at [www.mtavalanche.com/advisor](http://www.mtavalanche.com/advisor), or call 406-587-6981 to hear the center's latest advisory.

BOZEMAN DAILY  
**CHRONICLE**

## *Walking in a winter wonderland*



SEAN SPERRY/CHRONICLE

**A skier hikes along The Ridge looking for untracked snow at Bridger Bowl after the area received more than 16 inches of snow this week. With the large snow accumulation the Gallatin National Forest Avalanche Center issued an elevated avalanche warning for the surrounding mountain ranges. For today's avalanche advisory visit [www.mtavalanche.com](http://www.mtavalanche.com) or call 587-6981.**

*FRONT PAGE, TUESDAY, APRIL 1*