

2011-2012 Annual Report



Gallatin National Forest AVALANCHE CENTER

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406-587-6984 www.mtavalanche.com

Acknowledgements

**FRIENDS OF THE AVALANCHE CENTER
BRIDGER BOWL
COOKE CITY MOTORSPORTS
MONTANA FISH, WILDLIFE AND PARKS**

**Montana Import Group
Mystery Ranch**

**Northern Lights Trading Company
Montana Ale Works
Hans Saari Memorial Fund
Yellowstone Club Community Foundation
Alpine Orthopedics
95.1 KMMS**

**Pinhead Classic
Gallatin County Search and Rescue
Cliff Gullett Memorial Fund
On Site Management**

**Javaman
Big Sky Ski Patrol
Moonlight Basin Ski Patrol
Gallatin Valley Snowmobile Association
NRCS**

**National Weather Service-Billings, Great Falls
World Boards**

**Cold Smoke Awards
Indulgence
Planet Natural
Lone Peak Brewery
Grizzly Outfitters
Madison River Brewing Company**

Cover: Large, destructive wet slab avalanches were released at Bridger Bowl Ski Area, March 27

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From the Director: Our 22nd Year of Operation



Greetings!

We just wrapped up our 22nd season of avalanche forecasting with 138 advisories. It was a busy, challenging winter and Mark Staples, Eric Knoff and I want to thank everyone for their support.

The winter started out with La Nina's flirtatious promises. We truly believed we were going steady, reaping her gifts of deep and plentiful snow, but in the end she wouldn't return our calls. We were jilted for Alaska and lived with below average snowfall for most of the season which allowed weak, faceted snow to form at the ground. This poor snow structure led to many avalanches and prolonged periods of dangerous conditions. The first measurable snowfall occurred on November 6th with the season's first avalanches reported the next day. We issued intermittent avalanche bulletins until beginning daily advisories on December 7th. By the time the first large snowstorm arrived on December 29th, the snowpack's foundation had changed to rotten, airy depth hoar. We issued our first Avalanche Warning on the 30th. Before sunset on the 31st there were two separate avalanche fatalities outside Cooke City involving a skier and snowmobiler. Seven weeks later a huge snowstorm on top of an unstable snowpack led to a third fatality outside Cooke City, also involving a snowmobiler. Over the course of the winter we issued five separate Avalanche Warnings, a new record. The persistent weak layer at the ground caused some slopes to avalanche two or three times. There were many close calls in the backcountry. At season's end, besides the three fatalities, 51 avalanche incidents were reported.

THE GNFAC INDEX

- Total number of people getting our advisory every day: 4,365
- Percentage increase over last year: 15
- Number of "Likes" on Facebook and "Followers" on Twitter: 1,953 and 836
- Total number of avalanche classes taught and individual attendees: 81 and 4,436
- The number of Level 2 avalanche certification classes offered for snowmobilers by the GNFAC: 1

- Total number offered in the entire US, ever: 1
- The number of YouTube videos made this season about the snowpack: 55
- Number of views: 117,039
- Number of miles logged on each of the two Yamaha Nytro snowmobiles that were donated by Cooke City Motorsports: 1,350
- Estimated highway miles we drove to access the field: 14,000
- Number of field days: 110
- Days that volunteers accompanied us into the field: 84
- Gallons of coffee downed by Doug this season (estimate): 30
- Amount the Friends of the Avalanche Center spent this season on education, weather stations, administrative support and snowmobiles, respectively: \$29,681; \$6,200; \$4,296; \$2,500
- Total amount the Friends have spent in support of the GNFAC since 1992: \$258,000
- The number of incidents and fatalities in the Gallatin National Forest since our inception 22 years ago: 716 and 38
- Number of marriage proposals via the avalanche advisory: 1 (see page 22)

Running the Gallatin National Forest Avalanche Center is a community wide effort. We rely on volunteers and broad financial support for our daily operation. Contributions from the Friends of the Avalanche Center and a Recreation Trails Grant from Montana Fish, Wildlife and Parks total 45% of our yearly budget. We are indebted to the recreation community and local businesses for supporting the Friends every year. The success of the GNFAC is a direct reflection of these strong local ties. Thank you for another great season.

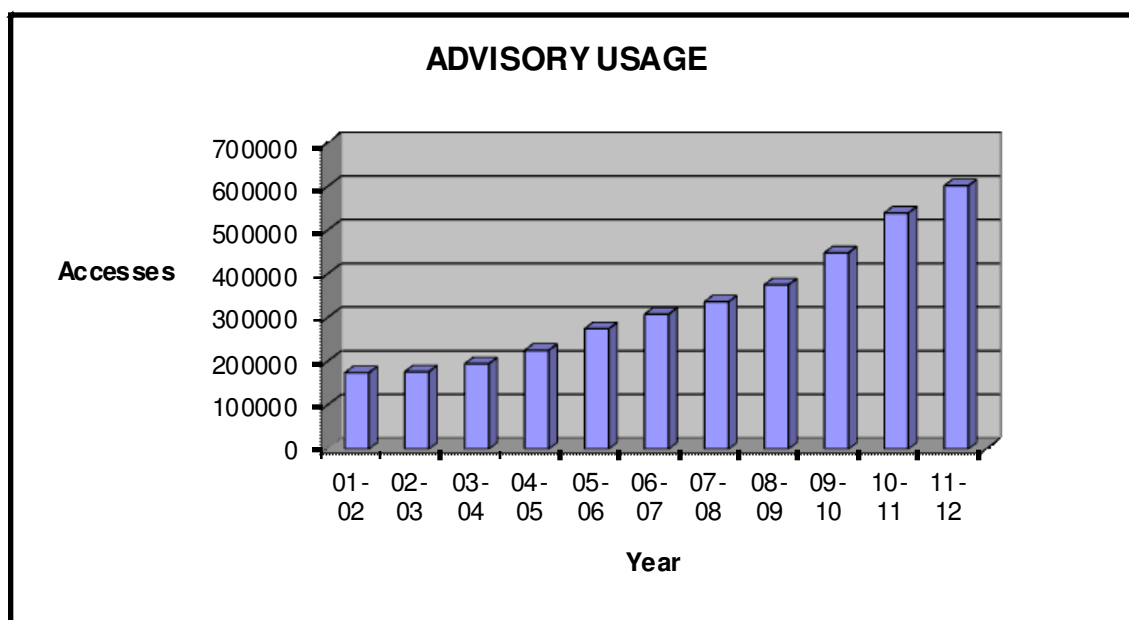
All the best,

Doug Chabot

Avalanche Advisories

This winter had a 15% increase in people accessing our advisories totaling 4,365/day. With more people recreating than ever before we made a concerted effort to subscribe folks to our advisories, especially among snowmobilers. Phone calls to our hotline remain steady at 65/day, but these pale in comparison to our 3,172 email subscribers. On top of that, the Avalanche Advisory page saw a huge jump in hits which averaged 1,114 a day.

The chart below reflects the growth of the advisory.



Our video postings to YouTube are one of the more popular things we provide. Usually under two minutes, these clips convey our primary avalanche concern for the day. We started making these in 2006 and so far the *AvalancheGuys* channel has gotten 729,000 views. We produced 55 videos this winter totaling 135,000 views—our best year yet.

We are averaging one video every other field day. These clips help us get the avalanche message across and anticipate we'll keep doing more every year. We also began attaching video thumbnails to our emailed advisory making them more accessible.

facebook

&

twitter

This season we expanded our use of social media. We relied on Facebook and Twitter to supplement our avalanche advisory message to the public. At the end of the season the Friends of the Avalanche Center had 1,958 followers on Facebook and 843 on Twitter. These venues allowed us to alert folks about new photos, videos or avalanches before the next mornings advisory.

Facebook also helps drive people to our website. It's the *third source of all traffic* behind Google and direct visits.



Website: www.mtavalanche.com

Our website is the portal to all information avalanche related. The redesign of the site three years ago was a huge success and every year we add more useful features.. Some new things this year:

- On our Home page we added danger ratings to a map of our advisory area
- Added graphical “wind-rose” charts to our weather station displays
- New design of the Weather page

The website had an astonishing 26% increase in traffic this season. Our site had 266,000 visits adding up to 622,000 unique pageviews. On average each visit lasted 2 min 45 seconds, a retention rate we're proud of. Furthermore, the most popular page was the Avalanche Advisory, followed closely by our Videos. Third was the Home page and fourth was the Photos page. The Weather pages, which link to all the remote weather stations, took places 5-10.

Mobile phone views account for almost 20% of our traffic, double last season. 55% of this total were on Apple devices: iPhones (almost 2/3), iPads (1/3) and a sprinkling of iTouches.

The screenshot shows the homepage of the Gallatin National Forest Avalanche Center (GNFAC). The header features the GNFAC logo on the left and the U.S. Forest Service logo on the right. The main banner image shows a person standing in a snowy mountain landscape. Below the banner, the title "Gallatin National Forest Avalanche Center" is prominently displayed. The left sidebar contains a "Current Advisory" section with links to Photos, Weather Information, Video, Education, Sidecountry Skiing, Resources/Other Info, Submit an Observation, Contact, and Home. Below this is a "Keep in Touch" section with social media icons and a "SUBSCRIBE!" button. The main content area includes a "RECORDED ADVISORY 406-587-6981" section, a "CURRENT ADVISORY" section with a welcome message and a map of the advisory area, and a "Gallatin National Forest Avalanche Specialists:" section featuring three individuals: Doug Chabot, Mark Staples, and Eric Kieff. The right sidebar contains a "Friends of the GNFAC" section with a registration link and a "GNFAC's Twitter Feed" section showing recent tweets.

Avalanche Education

The GNFAC and Friends of the Avalanche Center have been formal partners in avalanche education since 2003. This year we taught two classes at Montana State University that were attended by over 200 people with most attending the field sessions at Bridger Bowl. The bulk of our education efforts involve smaller groups for our 1-hour avalanche awareness lectures.

Highlights this year include:

- 34 of our classes were specifically for snowmobilers and reached 1,556 riders.
- We taught the nation's first Level 2 for Snowmobilers avalanche course. Seventeen snowmobile guides attended from Big Sky and West Yellowstone.
- Two separate classes with field sessions were held in Cooke City for snowmobilers living in Billings and Cody, WY.
- For the third year in a row we hosted a Professional Development Workshop for avalanche professionals. Six lectures on Decision-making and Psychology were given by avalanche professionals, a retired pilot, a Navy SEAL and MSU Psychology professor. All the lectures can be found on our Education page.



Level 2 for snowmobilers field day.

Avalanche Education

Avalanche education is a primary focus of the GNFAC. Working with the Friends of the Avalanche Center we taught 82 classes reaching 4,436 students. Of these, 59 were instructed by the Friends. Jay Pape, the Friends education coordinator, continues to be instrumental in growing this program every year. Scott Schmidt worked with Jay to spearhead and develop more snowmobiler specific classes than ever before.

Date	Group/Topic	Total
10/3/2011	Beaverhead SAR, Dillon/Awareness	28
10/23/2011	National Avalanche School-Avalanches	100
10/24/2011	National Avalanche School- Terrain	100
10/29/2011	Thunderstruck Premier, Lewistown/Awareness	100
11/4/2011	Montana Import Group, Bozeman/Awareness	35
11/9/2011	The Basecamp, Helena/Awareness	25
11/11/2011	Northern Lights Trading Company, Bozeman/Awareness	45
11/11/2011	Wild Joes Avalaunch, Bozeman/Awareness	35
11/12/2011	Ski Patrols- Avalanche Accidents	200
11/16/2011	Grizzly Outfitters, Big Sky/Awareness	45
11/17/2011	The Basecamp, Billings/Awareness	58
11/17/2011	Sleeping Giant Middle School, Livingston/Awareness	175
11/17/2011	NLTC- Avalanche Awareness	40
11/20/2011	Gallatin SAR Hasty, Bozemen/Awareness	45
11/22/2011	West Yellowstone Ski Fest/Awareness	12
11/22/2011	Chief Joseph Middle School, Bozeman/Awareness	125
11/22/2011	Science Olympiad, MSU Bozeman/Awareness	400
11/30/2011	Friends of GNFAC/ASMSU Basic Lecture Night #1	150
12/1/2011	Friends of GNFAC/ASMSU Basic Lecture Night #2	150
12/3/2011	Friends of GNFAC/ASMSU Basic Field Session	115
12/5/2011	Boy Scout Troop Bozeman/Awareness	28
12/6/2011	Families for Outdoor Rec, Billings/Awareness & Beacons	95
12/7/2011	Livingston/Snowmobile Intro to Avalanches, Lecture #1	22
12/7/2011	REI, Bozeman/Awareness	45
12/8/2011	Livingston/Snowmobile Intro to Avalanches, Lecture #2	25
12/8/2011	406 Brewery, Bozeman/Awareness	40
12/14/2011	Anaconda Snowmobile Club/Awareness	28
12/15/2011	GNFAC West Yellowstone Guides Course	25
12/16/2011	GNFAC West Yellowstone Guides Course Field	25
12/19/2011	Level 2 for Snowmobilers/ Classroom	18
12/20/2011	Level 2 for Snowmobilers/ Field	18
12/28/2011	GVSA/20-20	16
1/4/2012	REI, Bozeman/Women's Only Awareness	39
1/7/2012	Bozeman/Snowmobile Intro to Avalanches, Lecture	17
1/8/2012	Bozeman/Snowmobile Intro to Avalanches, Field	17
1/10/2012	Big Timber/Awareness	10
1/11/2012	REI, Bozeman/Awareness	45

Continued...

Avalanche Education

1/14/2012	Cooke City/Awareness	54
1/14/2012	Cody/ Snowmobile Intro to Avalanches, Lecture	30
1/16/2012	Gallatin SAR Possee, Bozemen/Rescue Procedures	50
1/16/2012	Level 2 for Snowmobilers/ Classroom	17
1/17/2012	20/20 Hindsight MIG	25
1/17/2012	Level 2 for Snowmobilers/ Field	17
1/17/2012	UM Western, Dillon/Awareness	35
1/19/2012	Great Falls/Awareness	65
1/21/2012	West Yellowstone/Awareness	20
1/23/2012	Spring Hill School, Bozeman/Awareness	17
1/24/2012	Billings/Snowmobile Intro to Avalanches, Lecture	31
1/25/2012	Friends of GNFA/ASMSU Lecture Night #1	107
1/26/2012	Friends of GNFA/ASMSU Lecture Night #2	98
1/28/2012	Friends of GNFA/ASMSU Field Session	83
1/29/2012	Billings/Snowmobile Intro to Avalanches, Field	29
1/31/2012	Exploration Works, Helena/Awareness	52
2/2/2012	Friends of GNFA/ASMSU Advanced Lecture Nights	84
2/3/2012	West Yellowstone/Awareness	15
2/4/2012	Friends of GNFA/ASMSU Advanced Field Session	40
2/4/2012	GVSA Poker Ride/Beacon Drills	65
2/6/2012	Bozeman Ranger District/Ava Center Overview	16
2/14/2012	Livingston High School/Awareness & Beacons	25
2/15/2012	MSU Earth Sciences Seminar/20-20 Hindsight	48
2/16/2012	REI, Bozeman/Awareness	35
2/17/2012	Cooke City, Snowhawks/Awareness	30
2/18/2012	West Yellowstone/Awareness	12
2/21/2012	Ennis High School/Awareness	30
2/26/2012	SnowShoot, West Yellowstone/Awareness	65
3/1/2012	SnowShoot, West Yellowstone/Awareness	70
3/1/2012	Bozeman Christian Cadets/Awareness	12
3/2/2012	SnowShoot, West Yellowstone/Awareness	15
3/2/2012	West Yellowstone/Awareness	10
3/5/2012	Polaris Int'l Dealer Meeting/ Ava Awareness	75
3/7/2012	Pro Development Seminar	50
3/11/2012	Park County SAR/ Field Session	4
3/17/2012	World Snowmo Expo, West Yellowstone/Education Booth	250
3/18/2012	World Snowmo Expo, West Yellowstone/Education Booth	75
3/20/2012	REI, Bozeman/Awareness	22
3/31/2012	Grizzly Outfitters, Big Sky/Beacon Clinic	14
3/29/2012	Hyalite Elementary, Awareness	78
3/30/2012	Ophir School/ Wet avalanches	15
4/18/2012	Bozeman Leadership/GNFA	25

TOTAL = 81 Talks/Seminars/Field Sessions to 4,436 people

Avalanche Education: Articles

As part of our education efforts we write avalanche related articles. The Montana Snowmobile Association has a monthly newsletter which we contribute to. The Bozeman Daily Chronicle prints a supplement titled Carve, November through February. This magazine is dedicated to skiing and we pen articles on avalanche safety in a monthly column. We also write for the professional trade journal The Avalanche Review. In order to reach a wide audience, we started posting these articles on a separate blog. You can read these at mtavalanche.blogspot.com.

DATE	AUTHOR	PUBLICATION	TITLE
11/1/2011	Knoff	Montana Snowmobile Assoc Newsletter	Avalanche Education
11/1/2011	Knoff	Montana Snowmobile Assoc Newsletter	Know Your Avalanche Transceiver: Practice Makes Perfect
11/1/2011	Chabot	The Avalanche Review	Snowmobile Education at the GNFA
11/1/2011	Chabot	Carve	Tune Your Skis, Tune Your Mind
11/1/2011	Chabot	The Avalanche Review	SnowPilot Upgrade
12/1/2011	Chabot	Carve	Smart Santa
12/1/2011	Knoff	Montana Snowmobile Assoc Newsletter	Risky Business; Factors to consider when riding in the backcountry
12/15/2011	Chabot	Snowmobile Storm	Avalanche Safety and Awareness
1/13/2012	Chabot	Carve	Avalanche Safety Trifecta: Remember the three simple steps to help ensure backcountry safety
1/15/2012	Knoff	Montana Snowmobile Assoc Newsletter	The Human Factor - The Avalanche Wildcard
2/15/2012	Knoff	Montana Snowmobile Assoc Newsletter	Clear Skies Does Not Always Equal Clear Sailing
2/17/2012	Chabot	Carve	Inquiring Minds Want To Know: Avalanche safety questions, answers Avalanche Warnings and Tragedy on New Year's
3/1/2012	Chabot/Knoff	The Avalanche Review	Eve Day

Avalanche Incidents



Filming Pete Maleski of Bridger Bowl after a large natural avalanche released in the sidecountry on Saddle Peak.

Mark Staples hikes through large debris from a snowmobiler triggered slide in the Bridger Range.



Avalanche Incidents

Unfortunately, there were three avalanche fatalities in our advisory area, all in the mountains around Cooke City. Throughout our advisory area conditions were unstable much of the time and we put out five Avalanche Warnings encompassing 12 days, more than ever before.

We recorded 51 avalanche incidents resulting in 7 people being caught, 4 partial burials, 3 full burials and 3 deaths.

DATE	LOCATION	DETAILS
11/12/2011	N. Madison	2 skier triggered
11/15/2011	Bridgers	1 skier triggered
11/16/2011	N. Gallatin	1 skier triggered
11/18/2011	N. Gallatin	1 skier triggered
11/26/2011	Cooke	1 snowmobile triggered
12/16/2011	N. Madison	1 skier triggered
12/21/2011	Cooke	1 skier triggered
12/30/2011	S. Madison	1 skier triggered
12/30/2011	Cooke	1 skier triggered
12/30/2011	Cooke	1 skier triggered, caught, partially buried
12/31/2011	Cooke	1 snowmobiler triggered, caught, buried, killed
12/31/2011	Cooke	1 skier triggered, caught, buried, killed
1/3/2012	Cooke	1 skier triggered
1/5/2012	S. Madison	1 snowmobile triggered
1/7/2012	S. Madison	1 snowmobiler triggered
1/14/2012	Cooke	1 skier triggered
1/19/2012	Cooke	1 skier triggered
1/19/2012	S. Madison	2 skiers, separately, remote trigger
1/19/2012	Lionhead	1 skier, remote trigger
1/20/2012	N. Madison	1 skier triggered
1/20/2012	S. Madison	1 snowmo triggered
1/21/2012	Cooke	1 snowmo triggered, partially buried
1/21/2012	Cooke	1 snowmo triggered
1/22/2012	Lionhead	1 skier, remote trigger
1/22/2012	Lionhead	2 snowmobilers, separately remote trigger
1/23/2012	Cooke	1 snowmobiler triggered, caught, partially buried
1/26/2012	N. Madison	1 skier triggered
1/31/2012	Cooke	1 snowmobile triggered
2/2/2012	Cooke	1 skier triggered
2/11/2012	N. Gallatin	1 skier triggered
2/16/2012	N. Gallatin	1 skier triggered
2/18/2012	N. Gallatin	2 skier triggered
2/18/2012	Cooke	1 skier triggered
2/18/2012	N. Madison	1 skier triggered
2/19/2012	N. Madison	1 skier triggered
2/20/2012	N. Gallatin	1 skier triggered

Continued...

Avalanche Incidents: Local

2/22/2012	Cooke	1 skier triggered
2/22/2012	Cooke	1 snowmobiler caught, buried, killed
2/24/2012	Bridgers	1 skier triggered, caught, partially buried, injured
2/24/2012	N. Madison	1 skier triggered
2/26/2012	N. Madison	1 skier triggered
2/26/2012	Bridgers	1 skier triggered
3/1/2012	N. Madison	1 snowmobiler triggered
3/3/2012	N. Madison	1 snowmobiler triggered
3/4/2012	N. Madison	1 snowmobiler triggered
3/10/2012	N. Madison	1 snowmobiler triggered
3/11/2012	Lionhead	1 snowmobiler triggered and caught
3/17/2012	Lionhead	1 snowmo triggered
3/19/2012	S. Madison	1 skier triggered
3/23/2012	Bridgers	1 skier triggered

Local Avalanche Incident Data for 1990-2012

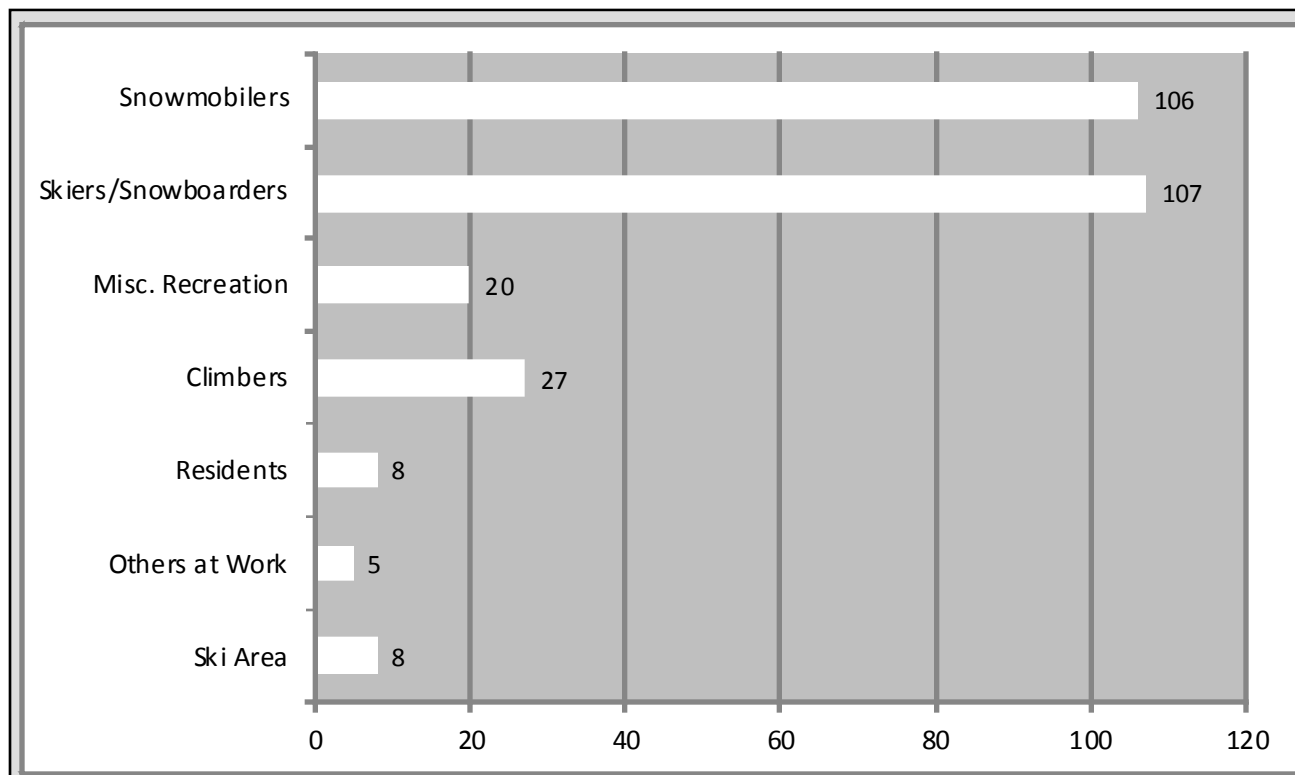
	Total Incidents	Skier/ Boarder/ Climbers Buried	Snowmobilers Buried	Skier/ Boarder/ Climbers Fatalities	Snowmobiler Fatalities
2011-2012	51	3	4	1	2
2010-2011	33	2	0	1	0
2009-2010	87	6	3	1	2
2008-2009	45	4	9	0	3
2007-2008	45	4	11	1	0
2006-2007	26	3	5	1	2
2005-2006	22	1	7	0	2
2004-2005	35	4	4	2	0
2003-2004	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
TOTALS	716	80	120	11	27

2011-12 US Avalanche Fatalities: 30

As of May 15 there were 30 avalanche fatalities in the US. The breakdown by state is: CO-7; MT-7; UT-5; WA-4; WY-3; AK-2; CA-2.

Nationally, in the last 10 years, total motorized vs. ski/snowboard deaths is near equal.

Graph & Table of US Fatalities by Activity: 10 Years



ACTIVITY	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	TOTAL
Climbers	5	4	5	0	0	2	1	5	2	0	27
Skiers/Snowboarders	11	6	15	8	9	11	5	9	14	19	107
Snowmobilers	14	6	4	12	10	13	16	17	4	9	106
Ski Area	0	0	2	0	0	1	3	1	0	1	8
Misc.	0	4	2	3	1	4	0	0	1	1	20
Residents	0	3	0	0	0	2	1	2	0	0	8
At Work	0	1	1	0	0	0	1	1	1	0	5
TOTAL	30	24	29	23	20	33	27	35	22	30	281

Weather Stations

Weather stations are crucial for understanding the avalanche danger. These remote sensors are maintained by public and private entities with a common goal of sharing the data. We'd like to give special recognition to:

- Lucas Zukiewicz of the NRCS. Lucas is the master of all the SNOTEL data that we heavily rely on every morning.
- Bridger Bowl, Big Sky, Moonlight Basin and Yellowstone Club ski areas. They have stations at all elevations and aspects which greatly aid us in collecting data for the advisory.

Our weather page gets heavy traffic from the public. This season our weather pages had over 95,000 unique pageviews. Next to the avalanche advisory, weather is the most popular piece of information we provide.

The Friends of the Avalanche Center owns and maintains four remote weather stations:

- Hyalite
- Taylor Fork (added this year)
- Lionhead
- Cooke City

Mark Staples sets up the weather station near the summit of Flander's Peak in the Hyalite drainage.



Finances and Fundraising

The Gallatin National Forest supplies the Avalanche Center with 60% of its funding, amounting to \$123,684. This covers benefits, travel, vehicles, computers, office space and other support, plus 67% of our overall salaries. We rely heavily on community support to cover our budget shortfall with the rest of our monies coming from the following supporters:

THE FRIENDS OF THE AVALANCHE CENTER: \$42,677

The Friends of the Avalanche Center have supported us since their inception in 1992. Pages 19-21 detail their contributions and fundraising efforts. The Friends cover much of our administrative, snowmobile and avalanche education expenses.

MONTANA FISH, WILDLIFE AND PARKS, RECREATION TRAILS PROGRAM GRANT: \$45,000

Montana Fish, Wildlife and Parks continues to be a strong outside supporter of our avalanche program. This winter we were awarded the top amount, \$45,000, which was our 13th year receiving a RTP grant. A huge thanks goes to Steve Gilbert, now retired, and Beth Shumate at FW&P for their continued support.

GALLATIN COUNTY SEARCH AND RESCUE: \$4,000

Gallatin County SAR has been the Avalanche Center's partner since we started 22 years ago. They donate \$4,000 annually to our operation. We work very closely with GCSAR since they perform backcountry rescue in our region. Lt. Jason Jarrett and Sheriff Brian Gootkin run an exceptional crew of dedicated and well trained volunteers.



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 receive 40% of our budget from outside sources.

The Friends were founded in 1992. Since then, they've donated over \$258,000 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, Ben Nobel, Ben Zavora, Adam Knoff and Scott Savage.

Where the money got spent:

AVALANCHE EDUCATION PROGRAM: \$29,681

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

- ♦ The Avalanche Education Program cost \$29,681 this winter. This includes, payroll, liability insurance, lodging, teacher supplies, bacon checkers and a beacon park.
- ♦ The Friends taught 59 avalanche classes this winter, a record number.

GNFAC SUPPORT: \$12,996

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

- ♦ Administrative. The Friends pay for things outside our normal operations such as brochures, software, beacons, office supplies, editing services, email subscription service, and fees to professional workshops. This totaled \$4,296.
- ♦ Snowmobile. Shannon and his wife Mona, owners of Cooke City Motorsports, worked with Craig Gagne of Yamaha to secure two snowmobiles for the GNFAC this winter. This season we rode 1,350 miles on each of the Nytro MTX four-stroke sleds. The Friends paid for maintenance, insurance, and repairs which totaled \$2,500.
- ♦ Weather Stations. The Friends purchased a remote weather station for the Taylor Fork area of the southern Madison Range. It ran perfectly and filled the void between the station in Lionhead, which got an upgrade, and the Big Sky ski areas. This new station and Lionhead upgrade cost \$6,200.

Friends of the Avalanche Center

Where the money comes from:

POWDER BLAST: \$21,826

The Friends held their 13th Powder Blast on October 28th at the Emerson Cultural Center. The Title sponsor was Montana Import Group with supporting monies from Mystery Ranch. For \$30 folks got dinner, music, drinks and tables of silent auction items. We sold almost 250 tickets and raised \$21,826! This event is the season's single largest fund raiser for the Friends.

AVALANCHE CLASSES: \$21,075

The Friends accept donations at all their avalanche classes which offset expenses. Online registration has made signing up easier and also allows folks to donate through PayPal. Field courses are popular yet need a lot of instructors which increases costs. Besides salaries, insurance costs associated with these sessions are not trivial so course donations go directly to this overhead.

YELLOWSTONE CLUB COMMUNITY FOUNDATION: \$5,000

The Yellowstone Club Community Foundation is supporting us for the third year in a row with a substantial grant. This is the sixth winter that the Club has helped fund our operation.

KING AND QUEEN OF THE RIDGE: \$3,559

Bridger Bowl held the 10th King and Queen of the Ridge on February 11th. Individuals and families hiked laps on the ridge for pledges with all proceeds are earmarked for our Avalanche Education Program. Nikki Kimball was crowned Queen with a record 27 hikes, and Nate Opp and Eric Knoff split the King title with 26 hikes. This year competitors raised \$3,559 for the Friends which will be used for next years classes. Since the first King and Queen in 2003, Bridger Bowl has helped us raise \$92,694!

MONTANA ALE WORKS WINE DINNER: \$2,100

Albert McDonald, Dawn Brown and Chef Roth Jordan organized the fourth annual fundraising dinner for the Friends on February 8th. It was a six course extravaganza of creative, global pub food paired with five exquisite wines from Sean Minor. The restaurant



Eric Knoff stands next to a crown at Lionhead during an Avalanche Warning .

Friends of the Avalanche Center

donated all the staff and food, plus generously gave the Friends all the ticket proceeds.

OTHER DONATIONS

- Pamela Anderson Wallace generously donated \$4,000 to our efforts
- \$1,000 from LeAnne Gullett of the Cliff Gullett Memorial Fund
- \$1,000 from Drew Seessel of the Hans Saari Memorial Fund
- \$1,000 from an Anonymous donor
- \$750 from the International Snowmobilers Manufacturing Association
- \$600 from Briana Schultz of the Pinhead Classic
- \$500 from the Upper Yellowstone Snowmobile Club of Cooke City
- The Gallatin Valley Snowmobile Association and Citizen's for Balanced Use each donated \$325 at the annual Poker Ride.



Hunting for instability: digging countless columns of snow for ongoing research.

Marriage Proposal

Seth and his girlfriend Kirsten are devoted readers of the avalanche advisory. Seth thought it would be unique and memorable to propose marriage through the advisory. On January 28th, here's what we wrote:

***Special Note:** Today Seth Meyer would like to ask his girlfriend Kirsten Drake to marry him. If you see them out skiing, wish Seth good luck and hope she says yes.*

And here was her response:



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 \$42,500. These donations reflect a dollar estimate of what it would cost to hire people or buy/rent equipment.

Equipment:		FIELD VOLUNTEERS/ OBSERVERS Volunteers donated 72 field days to the GNFAC as they accompanied us in our pit digging endeavors. It's impossible for the three of us to only go out with each other, thus we rely on volunteers to accompany us. These folks are our peers with many being professional snow workers. The standard is high and we can not emphasize enough how grateful we are for their work. We also count on folks emailing or calling us with their personal field observations. Some of the more regular observers were Beau Fredlund, Ben Zavora, Mason Young, Ben VandenBos and the crew of Ace Powder Guides in West Yellowstone. The ski areas would also
Cooke City Motorsports	\$8,000	
Labor:		
Big Sky Ski Area	\$2,500	
Bridger Bowl Ski Area	\$2,500	
Yellowstone Club	\$2,500	
Moonlight Basin	\$2,500	
National Weather Service	\$2,500	
NRCS	\$3,600	
Volunteer observers	\$7,500	
Field volunteers (550+ hours)	\$11,500	
TOTAL	\$42,500	

feed us valuable information about their avalanche control work and observations about the sidecountry.

COOKE CITY MOTORSPORTS and YAMAHA

Snowmobiling is an integral part of our job and we're lucky to have support from Shannon and Mona at Cooke City Motorsports. They work with Craig Gagne of Yamaha to loan us two snowmobiles, which will continue next season.

JOHN THE INTERN

John Barkhausen of Prescott College interned with us for a month. He accompanied us in the field and assisted us regularly in the office with our digital media. John was a solid partner and we hope to see him working in the snow and avalanche world in the future.

Budget

Income

Montana FW&P Rec Trails Program

◆ RTP 2010 \$35,000

Gallatin County Search and Rescue \$4,000

Friends of the Avalanche Center

◆ Avalanche Education Program \$29,681

◆ Administrative Support \$4,296

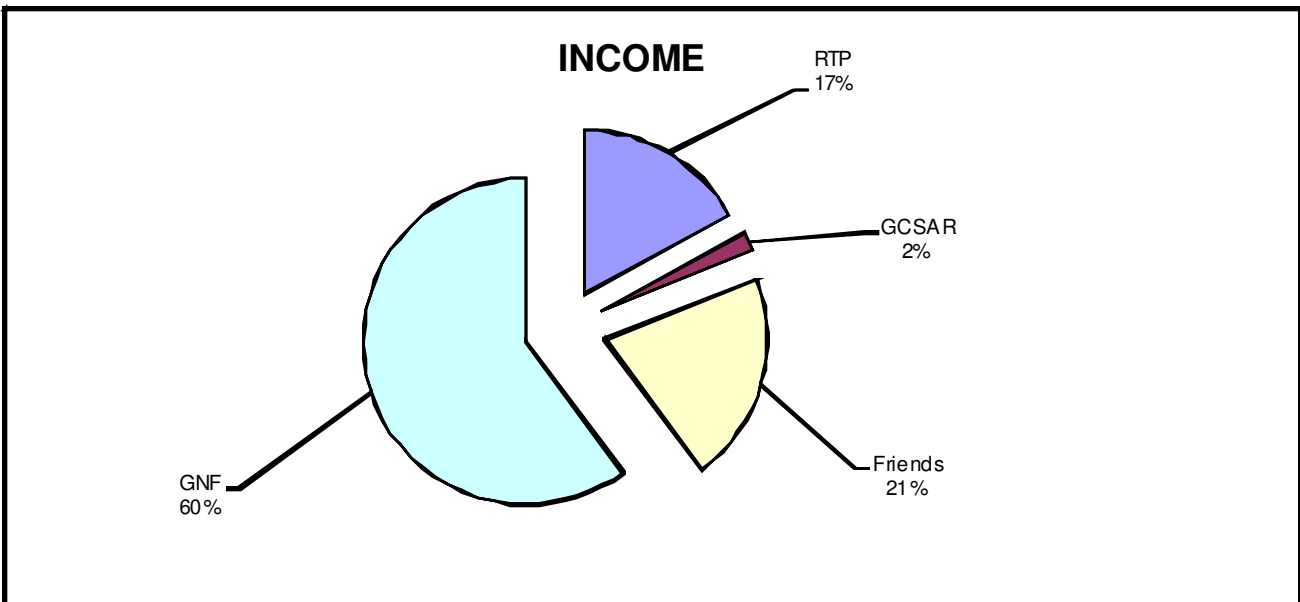
◆ Snowmobile expenses \$2,500

◆ Weather Stations \$6,200

TOTAL CASH CONTRIBUTIONS \$81,677 (40%)

TOTAL GALLATIN NATIONAL FOREST CONTRIBUTION \$123,684 (60%)

TOTAL INCOME \$200,977(100%)

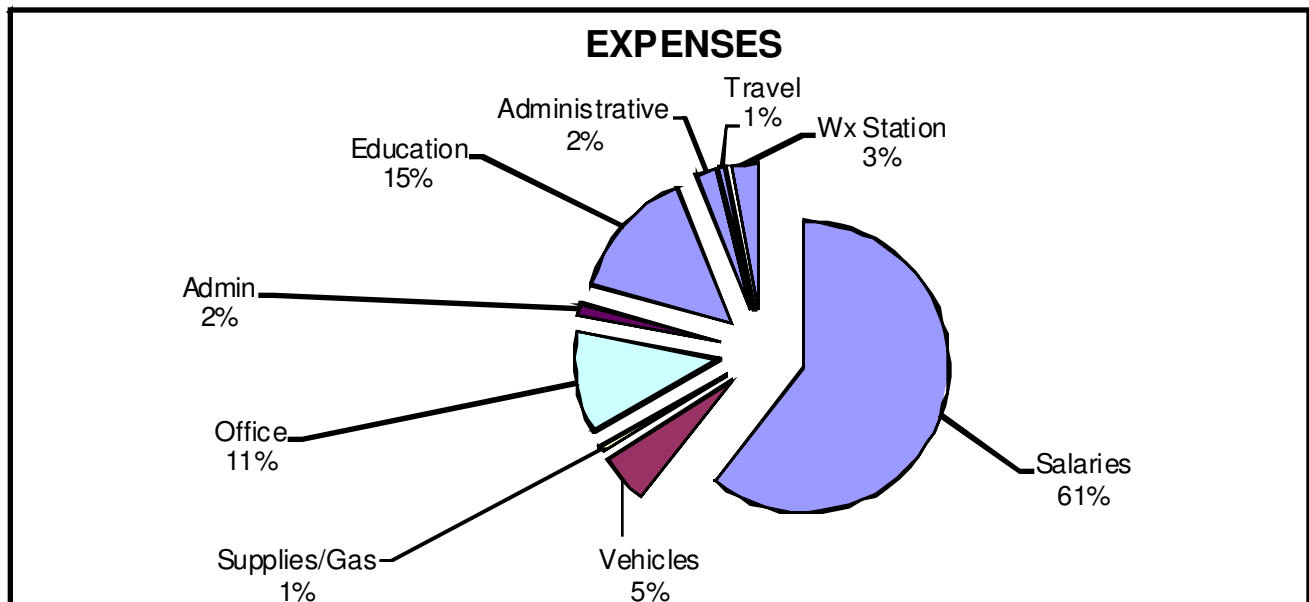


Budget

Expenses

Salaries/OT/Benefits :

GNF	\$82,800
Outside sources	\$39,000
GNF Office	\$22,500
GNF Vehicles	\$11,000
GNF Travel	\$1,500
GNF Supplies/Gas	\$1,500
Friends: Snowmobiles equip/maintenance	\$2,500
Friends: Education	\$29,681
Friends: Administrative costs	\$4,296
Friends: Weather Stations	\$6,200
TOTAL EXPENSES	<\$200,977>



Seasonal Snowpack and Weather Summary

By Mark Staples

Crazy weather during the 11-12 winter created instabilities in the snowpack that lasted throughout the season. As usual for southwest Montana snowfall comes early and forms the base of the snowpack. Often very cold weather metamorphoses this early snow into weak depth hoar at the ground. What was different this winter was a lack of very cold weather. Even though the meager snowpack was not exposed to such cold temperatures, it remained shallow for a very long time and was exposed to moderately cold temperatures. The result was a layer of depth hoar that produced avalanches throughout the season culminating with massive wet slab avalanches in the Bridger Range.

There were six notable weather events:

1. The New Year's Storm (Dec 28-31) that prompted an avalanche warning near Cooke City and West Yellowstone during which 2 fatalities occurred near Cooke City.
2. A storm in late January (Jan 18-22)
3. A period of dry weather in early to mid-February that formed a layer of near-surface facets in many areas.
4. Two storms in late February (Feb 20-23 & 25-26). A third avalanche fatality near Cooke City happened during this time.
5. Two storms in mid-March (Mar 13-15 & 16-20)
6. Above freezing weather in late March

Snow depths from area SNOTEL sites provide some insight into how the snowpack developed. In Hyalite Canyon and the Cooke City area, the snowpack began forming on October 7th. In both these areas the snowpack remained less than 2 feet deep for about 40 days. During this time depth hoar formed at the ground. A series of storms under a NW flow (which oddly did not bring snow to the Bridger Range) brought snow to Hyalite Canyon and several large avalanches and close calls occurred. Just after Thanksgiving avalanches began occurring near Cooke City. Avalanches breaking at the ground never happened again in Hyalite Canyon. This area became the one area with stable snow by late December and maintained good stability until late February when avalanches began occurring on a layer of near surface facets. Near Cooke City the crushing loads from big snow storms maintained enough stress on the depth hoar to continue making avalanches on this layer until it was finally buried so deeply that it gained strength.

Near West Yellowstone and in the Bridger Range the snowpack did not begin forming until early November. In both areas the snowpack remained less than 2 feet deep for 2 months and 2 ½ months respectively. Despite the lack of very cold weather, such a shallow snowpack for such a prolonged period produced weak depth hoar crystals near the ground. This depth

hoar produced avalanches for the rest of the season. Warm temperatures in March also played a big role. Near West Yellowstone, heavy rain fell during the weekend of March 17-18th and many wet avalanches occurred at low elevations including one that blocked Route 191 inside Yellowstone N.P. At higher elevations heavy snowfall, triggered many, very large, dry slab avalanches. Fortunately there were no fatalities or serious incidents near West Yellowstone. In the Bridger Range, a female skier tempted fate when she was caught in an avalanche on Saddle Peak and carried over 1500 feet downhill. She was rescued by Gallatin County SAR and flown by helicopter to the hospital with only a broken leg.

In early to mid-February, a period of dry weather with warm sunny days and clear cold nights produced a thin layer of near surface facets in many areas. Once more snow fell, the snowpack contained two prominent weak layers. Depth hoar remained near the ground and this layer of near surface



Argentina Bowl in the Bridger Range slid naturally March 20.

facets existed near the middle of the snowpack. These near surface facets produced avalanches for about a month. By mid-March this layer had either produced avalanches and no longer existed or had gained strength, and it was no longer a major stability issue.

The most exciting event was the sudden shift from dry snow avalanches to wet snow avalanches in the Bridger Range. March had many days with daytime air temperatures in the 40's F and bright sunshine that warmed the snowpack near its melting point. Two storms in mid-March produced widespread, dry snow, avalanche activity. More warm weather followed these storms, and liquid water percolating through the snowpack finally reached depth hoar near the ground. This depth hoar became weak and wet (technically it was moist which means a water content less than 3% by volume). An isolated storm delivered 1.8 inches of SWE to Bridger Bowl the night of March 26th. Depth hoar weakened by liquid water combined with a large load of snow allowed the Bridger Bowl Ski Patrol to trigger massive wet snow avalanches on the morning of March 27th.

TUESDAY, NOVEMBER 15, 2011

OUR OPINION

Be safe, aware this ski season

The first snows of the year are greeted with a certain amount of giddiness in ski country. It's time to make plans for hitting the slopes.

For most, this entails getting a lift pass to the favorite ski hill. For a growing number of snow enthusiasts, this means heading out into the backcountry. And this increase in the popularity of backcountry skiing, boarding and snowmobiling has been translating into an increase in backcountry tragedy.

It doesn't have to be this way. Backcountry injuries and fatalities can be avoided by gearing up with the right equipment. But that equipment won't be of much use if it isn't accompanied by training. First-aid training and supplies are a must for backcountry enthusiasts, no matter what season it is.

But, in winter, heading out into the mountains without training in avalanche awareness, prevention and reaction is foolhardy.

We're fortunate here in southwest Montana in that we have some of the pioneers in avalanche research and training right here on the Gallatin National Forest. And, even better, they make this training available to the public.

The Gallatin National Forest Avalanche Center is offering an Introduction to Avalanches with Field Course on Nov. 30, Dec. 1 and Dec. 3. This workshop includes lectures on Wednesday and Thursday evenings from 7 p.m. to 9:30 p.m. in Johnson Hall at Montana State University with a field course on Saturday from 9:15 a.m. to 3 p.m. at Bridger Bowl ski area.

The course features information on recognizing avalanche prone terrain and search and rescue procedures along with decision-making guidelines. Participants are asked to provide their own appropriate equipment and have basic skiing or snowboarding skills.

And all that's asked in return is a \$25 donation to the Friends of the Avalanche Center.

This is an invaluable resource to anyone who plans to ski or ride in the backcountry this winter. Don't become a statistic. Be safe and — and be prepared.

BOZEMAN DAILY
CHRONICLE

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