

Gallatin National Forest AVALANCHE CENTER



2010-2011 Annual Report

10 E. Babcock St., Bozeman, MT



406-587-6984 www.mtavalanche.com

Acknowledgements

**FRIENDS OF THE AVALANCHE CENTER
BRIDGER BOWL
TEAM BOZEMAN
MONTANA FISH, WILDLIFE AND PARKS**

**Montana Import Group
Northern Lights Trading Company
Montana Ale Works
Hans Saari Memorial Fund
The Yellowstone Club Community Foundation
Alpine Orthopedics
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Cliff Gullett Memorial Fund
On Site Management
Javaman
Bountiful Table
Big Sky Ski Patrol
Moonlight Basin Ski Patrol
Gallatin Valley Snowmobile Association
NRCS
National Weather Service-Billings
World Boards
Cold Smoke Awards**

Cover: A large avalanche on Republic Peak which overlooks Cooke City. Photo: Beau Fredlund

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From the Director: Our 21st Year of Operation



Greetings!

All of us at the Gallatin National Forest Avalanche Center--- Mark Staples, Eric Knoff and I, Doug Chabot--- want to thank you for a great year. We are grateful for the community support of the Gallatin National Forest and Friends of the Avalanche Center. This month finishes our 21st year of operation with a record 145 avalanche advisories.

It was a long season. The first snows hit the valley floor on October 26th and our first reported avalanche was November 9th. La Nina predictions of steady snowfall proved true and we began issuing daily avalanche advisories on November 15th, the earliest start in 14 years. Steady intervals of snowfall kept weak layers from developing into longstanding problems. This season most of the instability was associated with new snow and wind-loading, a more manageable avalanche problem than persistent weak layers. With above average snowfall and no major avalanche cycles people hit the backcountry with abandon. Big lines got skied, boarded and highmarked, but not all outings had good endings. A snowboarder was killed in Truman Gulch in the Bridger Range on February 14 when a steep gully avalanched after severe winds cross-loaded slopes. A week earlier a skier broke his femur in Frazier Basin, also in the Bridger Range, when he was swept in an avalanche down a steep slope. We had 33 avalanche incidents reported, less than half of last season's number.

Our Highlights

- ◆ An average of 3,725 people a day got our advisories, a 6% increase from last year.
- ◆ In partnership with the Friends of the Avalanche Center we taught 79 classes attended by 4,595 people.
- ◆ We created 35 YouTube videos that were viewed 29,627 times. Shooting with a Flip camera, many of these movies were in HD.
- ◆ On the social media front, the Friends of the Avalanche Center have 1,485 followers on Facebook and 495 folks on Twitter.
- ◆ The Friends purchased a new weather station that we placed near Flanders Peak up Hyalite Canyon in the Gallatin Range. This allowed us to keep better tabs on wind-loading in a range that is seeing a huge increase in backcountry use, both from ice climbers and skiers/boarders.

- ◆ The Friends ran an online survey to which 500 folks responded. As a result we changed and added a few things to our website: snowpits are now viewable, the weather page is more streamlined, photos are attached to the emailed advisory, stability tests tutorials are on line as well as postings of avalanche lectures.
- ◆ Team Bozeman and Yamaha partnered with the Friends to loan us two, 2011 MTX Nyo-tro snowmobiles. We clocked over 1,300 miles on each one which allowed us to visit otherwise inaccessible popular riding areas and investigate far flung snowpacks and avalanches.
- ◆ We ran a one day Professional Development Workshop on “Surprise Avalanches and Post Control Releases” in March. It was attended by 45 avalanche professionals. Eight of the lectures were recorded and posted on our website (www.mtavalanche.com).
- ◆ The Friends purchased a new Beacon Park which was installed at Beal Park in Bozeman, and West Yellowstone had one operating on a major trail for its second year. Next year a third park will be installed in Cooke City. These parks let people practice using their avalanche transceiver, a life saving skill.
- ◆ Last October we presented a paper on the Saddle Peak avalanche to an audience of over 600 avalanche workers at the International Snow Science Workshop in Squaw Valley, California.
- ◆ Our software program SnowPilot (www.snowpilot.org) was updated twice this winter. It’s a free graphing and database program to record snowpit information. Since its inception in 2003 over 5,000 snowpits have been recorded from all over the world, allowing researchers to study snow and avalanches from a robust dataset.
- ◆ Mark, Eric and I, along with Karl Birkeland of the National Avalanche Center and Jay Pape and Dale Gullett of the Friends of the Avalanche Center, won a national award from the Forest Service for *Safety and Occupational Health*.

It’s a team effort to run the Gallatin National Forest Avalanche Center. Montana FW&P Recreation Trail Program and the Friends of the Avalanche Center provide substantial monies to our operation. We are also fortunate to have the local community help us in many diverse ways. Each of our biggest supporters contributes money, gear or expertise worth thousands of dollars: Team Bozeman and Yamaha, Yellowstone Club Community Foundation, Montana Import Group, Northern Lights Trading Company, Alpine Orthopedics, Bridger Bowl, the Hans Saari Memorial Fund, Montana Ale Works and Gallatin County Search and Rescue contribute to the Friends and Avalanche Center.

If you have received the daily advisory, taken a class from us, sent in an observation or made a donation, thank you. The GNFA’s success is a direct reflection of all your support.

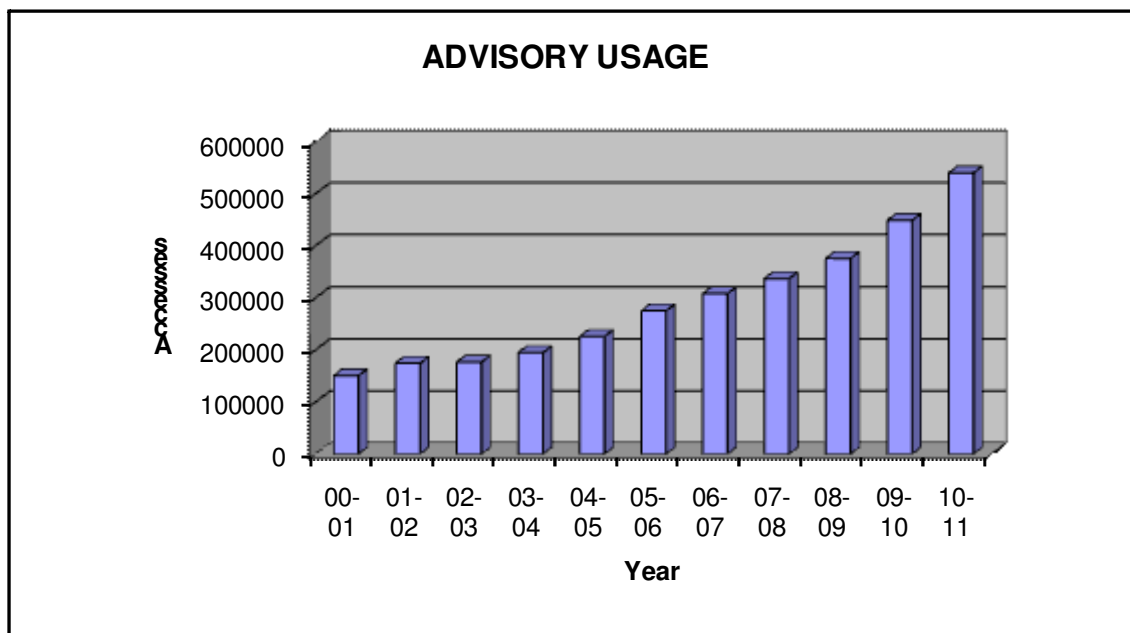
With gratitude,

Doug Chabot

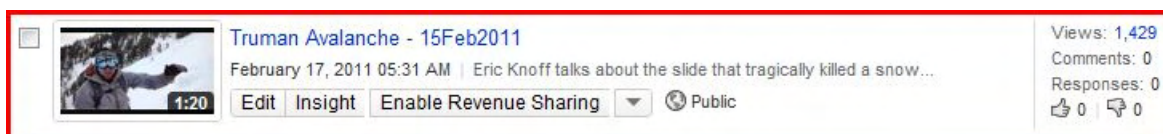
Avalanche Advisories

This winter 3,725 people a day got our daily avalanche advisories, a 6% increase from last year. This number included:

- ◆ 2,835 emails/day
- ◆ 803 hits/day to the Advisory page
- ◆ 67 hotline calls/day
- ◆ 20 faxes/day

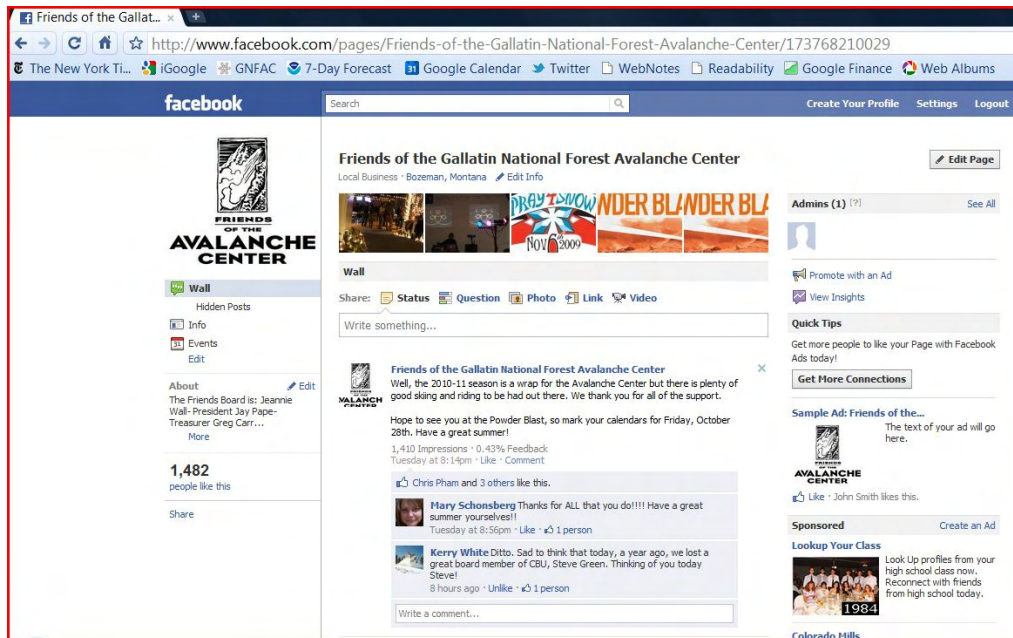


Posting videos of our snowpits, stability tests and avalanche investigations continue to be one of the more popular ways we reach people. This season we produced 35 videos that were viewed 29,627 times, each one averaging 846 views. Recognizing this impact, the Friends of the Avalanche Center purchased a HD video camera so we could improve the quality of our videos.





This season we continued to use social media to reach the public. We relied on Facebook and Twitter to help us reach all backcountry users. At the end of the season the Friends of the Avalanche Center had 1,482 followers on Facebook and 501 on Twitter. These venues allowed us to alert folks to new photos, videos or avalanches before the next mornings advisory.



Friends of the GNFAC Survey 2011

At the beginning of January the Friends held an online survey. The survey helped define our user groups and focus our future work to improve avalanche advisories and the website. A total of 485 people took the survey out of 2,800 people on our email list. This number of responses provided more than enough data to be statistically relevant and we took the results very seriously.

Below are a few key findings. Keep in mind that these numbers only represent those who completed the survey.

1. 1 in 4 have been caught in an avalanche with 88% uninjured.
2. Our users are 80% male, 20% female with an average age of 40 years old.
3. 80% primarily access avalanche information via email.
4. 72% primarily use skis/snowboards and 23% primarily use snowmobiles.
5. 93% said our photos and videos are valuable.

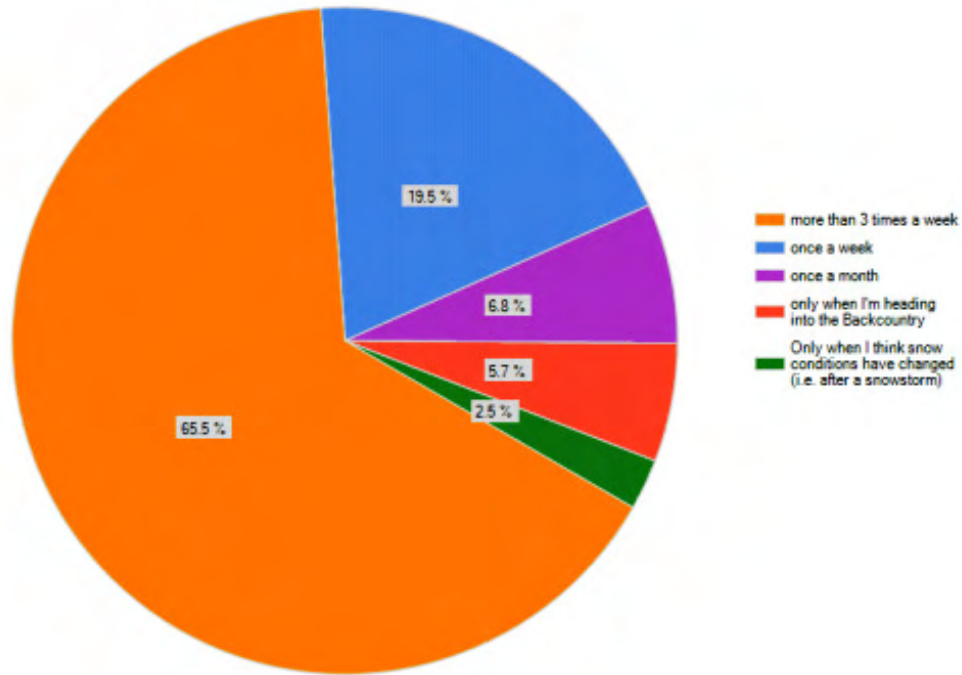
Qualitative responses and open ended questions were, by far, the most valuable part of this survey with recurring themes and insightful comments. In response to the survey we immediately implemented a few changes for this season:

- ◆ The addition of a snowpits page where every snowpit we dig was posted.
- ◆ A slight rework of our weather page to make it easier to navigate.
- ◆ Made the recorded advisory phone # more obvious.
- ◆ Added a link to other avalanche centers.
- ◆ Embedded photos in the emailed advisory.
- ◆ Added information and videos on common stability tests.
- ◆ We purchased a new Flip video camera for HD videos.

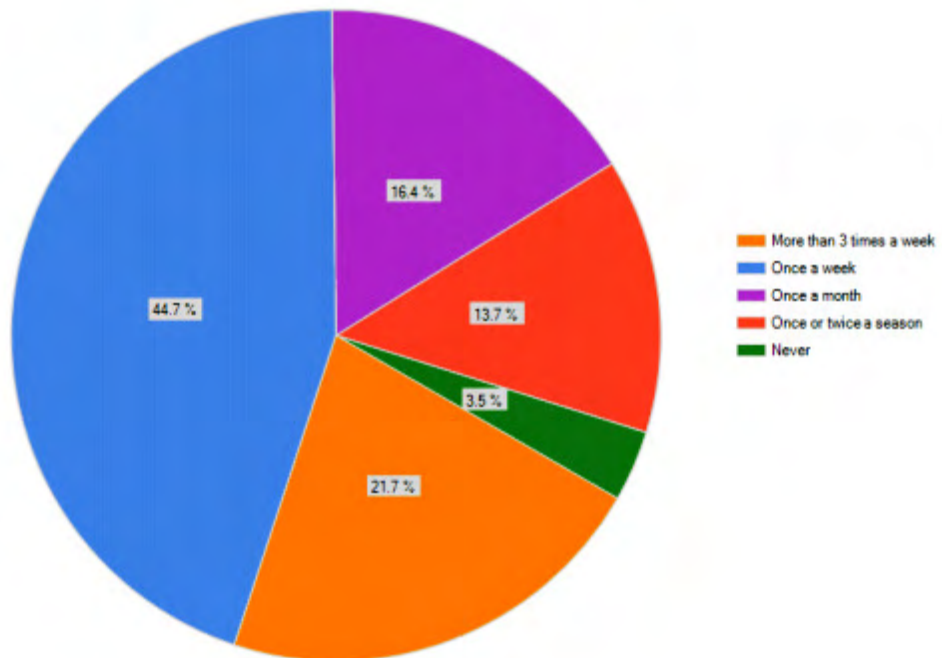
For next season we plan on making the following improvements:

- ◆ Embedding videos in emails.
- ◆ A map of common place names.
- ◆ A map on the homepage with danger ratings shaded over different regions.
- ◆ Adding “wind roses” to weather data.
- ◆ Reaching out to more young adults and more snowmobilers.

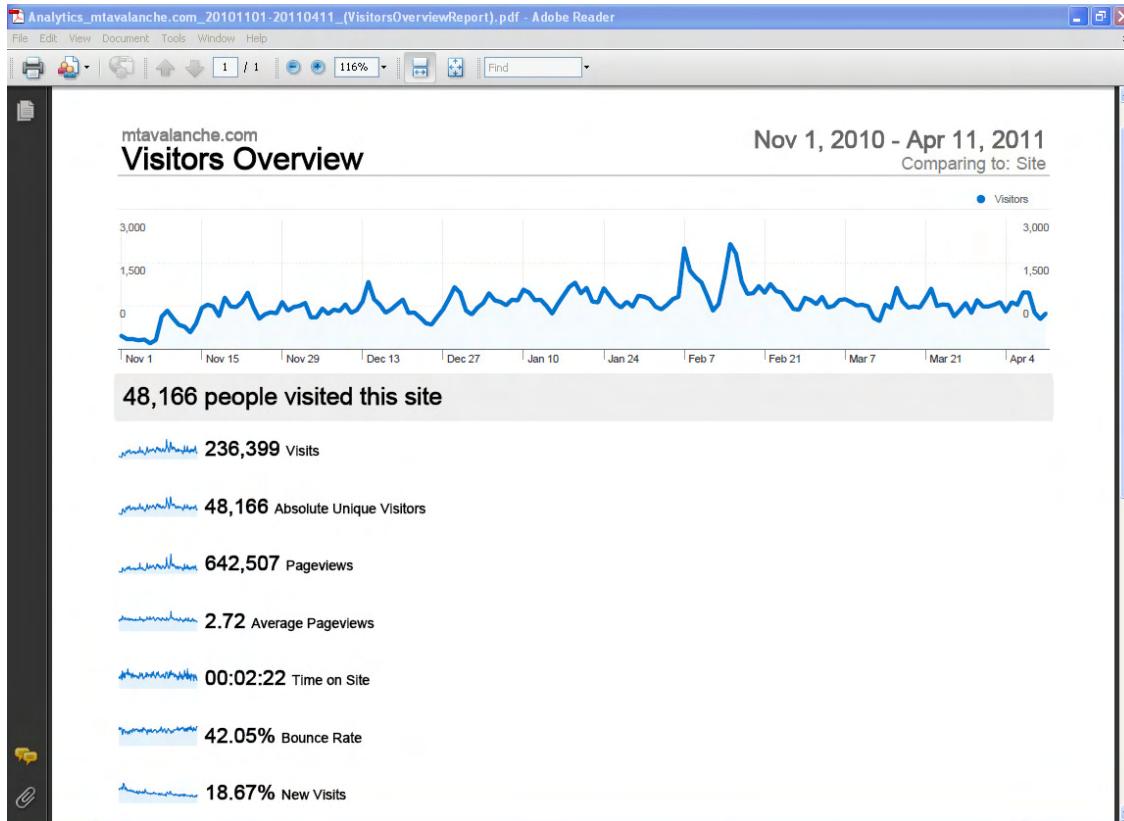
How often do you visit the Gallatin National Forest Avalanche Center (GNFAC) website (www.mtavalanche.com)?



How often do you recreate in the backcountry during the winter season?



Website: www.mtavalanche.com



Our website traffic continues to grow and remains the primary way we post avalanche information, photos and videos. In order of popularity our top three web pages are 1. the *Homepage*, 2. the *Avalanche Advisory* page, and 3. the *Photos* page. The *Weather* page with all its links take positions 4 through 13.

Mobile phone views account for 10% of the total number with the Android operating system garnering three times more traffic than the iPhone. I anticipate we'll see smart phone usage rise exponentially in the coming years.

The screenshot shows the homepage of the Gallatin National Forest Avalanche Center (GNFAC). The page features a large background image of a snowy mountain slope with a person standing on it. The website layout includes a navigation menu on the left with links for "Current Advisory", "Photos", "Weather Information", "Video", "Education", "Sidcountry Skiing", "Resources/Other Info", "Submit an Observation", and "Home". The main content area is titled "GNFAC Homepage" and includes a "RECORDED ADVISORY 406-587-6981" section with a "Results from Survey - Click HERE" link. Below this is a welcome message and information about the GNFAC's mission and location. A "Friends of the GNFAC" section encourages registration and donations. On the right, there is a "GNFAC's Twitter Feed" showing recent tweets. The page also features logos for the U.S. Forest Service and the U.S. Department of Agriculture.

Avalanche Education

Avalanche education is a primary focus of the GNFAC. Together with the Friends of the Avalanche Center we taught 79 classes reaching 4,595 students. Jay Pape, the Friends education coordinator, continues to be instrumental in growing this program every year.

Date	Group/Topic	Attendance
10/22/2010	ISSW/Saddle Peak	600
10/26/2010	MT Youth Challenge Academy, Dillon/Awareness	85
10/28/2010	Chief Joseph Middle School/Awareness	200
10/30/2010	Thunderstruck #9 Premier, Lewistown/Intro	150
10/30/2010	Thunderstruck #9 Premier, Lewistown/Awareness	55
11/4/2010	Museum of the Rockies, Bozeman/Awareness	55
11/9/2010	Sleeping Giant Middle School, Livingston/Awareness	175
11/9/2010	Morning Star School- Cub Scouts, Bozeman/Stay Alive	60
11/10/2010	REI, Bozeman/Sidecountry	15
11/11/2010	REI, Bozeman/Sidecountry	9
11/11/2010	Northern Lights Trading Company, Bozeman/Awareness	25
11/11/2010	The Basecamp, Helena/Awareness	28
11/12/2010	Avalaunch/Awareness	25
11/15/2010	City of Bozeman Rec Dept/Awareness	10
11/17/2010	Grizzly Outfitters, Big Sky/Awareness	45
11/18/2010	The Basecamp, Billings/Awareness	32
11/19/2010	Ski Patrollers/ISSW recap & Sidecountry	150
11/21/2010	GCSAR/Recap	20
11/24/2010	West Yellowstone Ski Fest/Awareness	12
12/1/2010	Team Bozeman, Night #1/Basic Workshop	29
12/1/2010	Friends ASMSU, Night #1/Basic Workshop	202
12/2/2010	Team Bozeman, Night #2/Basic Workshop	29
12/2/2010	Friends ASMSU, Night #2/Basic Workshop	185
12/3/2010	FWP Groomers/Awareness #1	50
12/4/2010	FWP Groomers/Awareness #2	106
12/4/2010	Friends ASMSU, Field Session/Basic Workshop	110
12/7/2010	REI, Bozeman/Awareness	38
12/12/2010	Snowmobile Basic Workshop Field Day Buck Ridge	15
12/13/2010	City of Bozeman Rec Dept/Awareness	8
12/14/2010	Cooke City SAR & YNP/Awareness	18
12/15/2010	Cooke City SAR & YNP/Field Session	14
12/16/2010	West Yellowstone, Day #1/Basic Workshop	23
12/17/2010	West Yellowstone, Day #2/Basic Workshop	20
12/18/2010	West Yellowstone Kids In Snow/Awareness	12
1/1/2011	West Yellowstone, Day #1/Basic Workshop	10
1/2/2011	West Yellowstone, Day #2/Basic Workshop	11
1/7/2011	Ennis/Awareness	18

Continued...

Avalanche Education

1/9/2011	Helena Snowdfters/Awareness, Rescue, Beacons	28
1/11/2011	Big Timber/Awareness	10
1/12/2011	Gardiner RD/Awareness	9
1/12/2011	UM Western, Dillon/Awareness	35
1/12/2011	Family for Outdoor Rec, Billings/Awareness, Beacons	95
1/15/2011	GVSA/Beacons	45
1/15/2011	West Yellowstone/Awarness	16
1/18/2011	Mountain Valley Motor Sports, Cody/Awareness	42
1/19/2011	REI, Bozeman/Awareness	37
1/20/2011	Fish, Wildlife, and Parks	15
1/26/2011	Friends ASMSU, Night #1/Basic Workshop	92
1/27/2011	Friends ASMSU, Night #2/Basic Workshop	92
1/27/2011	West Yellowstone/Awarness	20
1/28/2011	Beacon Park Opening	30
1/29/2011	West Yellowstone/Awarness	24
1/29/2011	Friends ASMSU, Field Session/Basic Workshop	75
2/1/2011	Exploration Works, Helena/Awareness	12
2/2/2011	Friends ASMSU, Night #1/Advanced Workshop	22
2/3/2011	Friends ASMSU, Night #2/Advanced Workshop	22
2/5/2011	Friends ASMSU, Field Session/Advanced Workshop	17
2/5/2011	West Yellowstone/Awarness	32
2/7/2011	Bozeman Scout Troop 676/Sidecountry Awareness	17
2/8/2011	Belgrade High School/Sidecountry Awareness x7	280
2/9/2011	Sleeping Giant MS, Livingston/Beacon clinic x6	90
2/9/2011	Redline Sports, Butte/Awareness	5
2/16/2011	Anaconda Snowmobile Club/Awareness	18
2/16/2011	Park High School/Snow Science & Beacons	25
2/16/2011	Sacajawea Middle School/Avalanche Awareness	120
2/17/2011	Blackline Adventures Vet group/Awarenesss Beacons	6
2/18/2011	Sacajawea Middle School/Snow Crystals and Beacons	120
2/18/2011	Sacajawea Middle School/Stay Alive & Snowpit	80
2/18/2011	Snowhawk Gathering, Cooke City/Awareness	30
2/19/2011	West Yellowstone/Awarness	130
2/24/2011	City of Bozeman/Beacon Park Clinic	15
2/26/2011	Butte & Dillon BLM/Awareness	25
3/1/2011	GCSAR/Survivability	25
3/5/2011	Big Sky Institute/Awareness & Snowpit	15
3/8/2011	Bozeman Rotary Club/GNFAC	65
3/9/2011	Pro Development Workshop	45
3/19/2011	Big Sky Level II	23
3/20/2011	Emily Dickinson Elementry/Awareness x4	75
4/6/2011	Big Sky Rotary Club/GNFAC	12
4/6/2011	Bozeman Leadership/GNFAC	30

TOTAL = 79 Talks/Seminars/Field Sessions to 4,595 people

Avalanche Education

The GNFAC and Friends of the Avalanche Center have been formal partners in avalanche education since 2003. This year we taught three classes at Montana State University that were attended by over 400 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. Thirty one of the 79 classes were predominantly snowmobiler related.

The Friends also worked with the Bozeman Recreation Department to install a Beacon Park near downtown Bozeman. This unit was placed on the basketball court at Beal Park buried under a few feet of snow. This allowed folks to easily practice their rescue skills with an avalanche transceiver. We now have operating Beacon Parks in Bozeman, West Yellowstone and one planned for Cooke City too.

The Friends also bought Beacon Checkers. The GNFAC along with all the snow rangers got one of these units to place outside their vehicle at trailheads. A permanent one is placed on the highway leading out of Cooke City too. They light up when an transmitting beacon approaches. A Beacon Checker is another backup to make sure our safety gear is with us and working properly.



"It's got to be here somewhere?" Practice, practice, practice. Photo: Jason Kruger

Avalanche Incidents: Local

In general, this winter was one of the more stable ones in memory. Frequent snowfalls did not allow widespread weak layers to form, but even so, folks still got into trouble. We had a total of 33 incidents reported to us. Unfortunately, a snowboarder was caught, buried and killed in an avalanche on February 14th in the Bridger Range. A week prior a skier was caught and partially buried in the Bridger Range, but survived, although he sustained a serious femur fracture.

As of May 1 there were 22 avalanche fatalities in the US. The breakdown by state is: CO-6; WA-4; AK-3; MT-2; UT-2; WY-2; CA-2; ID-1.

DATE	LOCATION	DETAILS
11/9/2010	N. Bridger	1 skier triggered, not caught
11/18/2010	S. Bridger	1 skier triggered
12/11/2010	N. Madison	1 skier triggered, not caught
12/12/2010	N. Gallatin	1 skier triggered, not caught
12/13/2010	N. Bridger	1 skier triggered, not caught
12/15/2010	Cooke	1 snowmobile triggered, not caught
12/16/2010	N. Madison	1 skier triggered, not caught
12/22/2010	N. Madison	1 skier triggered, not caught
12/28/2010	Cooke	1 skier triggered
12/29/2010	Bridger	1 skier triggered
12/31/2010	N. Madison	1 snowmobile triggered, not caught
1/2/2011	Cooke	1 snowmobile triggered, not caught
1/6/2011	N. Madison	1 skier triggered, caught, not buried
1/9/2011	S. Bridger	1 skier triggered, not caught
1/16/2011	S. Madison	1 skier triggered
1/16/2011	Cooke	1 skier triggered
1/19/2011	N. Gallatin	1 climber triggered
1/20/2011	S. Madison	1 skier triggered
1/22/2011	Cooke	1 snowboarder triggered, caught, injured
1/26/2011	N. Madison	1 skier triggered, not caught
1/31/2011	Cooke	1 skier triggered, not caught
2/6/2011	Bridger	2 skier triggered, 1 caught, partial buried, injured
2/9/2011	Cooke	1 skier triggered
2/10/2011	N Madison	1 skier triggered
2/12/2011	N Madison	1 snowmobile triggered, not caught
2/14/2011	Bridger	1 skier triggered, caught, killed
2/27/2011	Cooke	1 skier triggered
3/17/2011	Bridger	1 skier triggered, caught, not buried
3/23/2011	Cooke	1 snowmobile triggered
3/25/2011	N Gallatin	1 skier triggered
4/9/2011	Bridger	2 skier triggered
4/10/2011	Lionhead	1 skier triggered, caught, not buried

Avalanche Incidents: 21 years

Local Avalanche Incident Data for 1990-2011

	Total Incidents	Skier/Boarder/Climbers Buried	Snowmobilers Buried	Skier/Boarder/Climbers Fatalities	Snowmobiler Fatalities
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	665	77	116	10	25

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:

- ◆ 18 people were buried in the Bridgers. One snowboarder and one skier were killed.

Elsewhere:

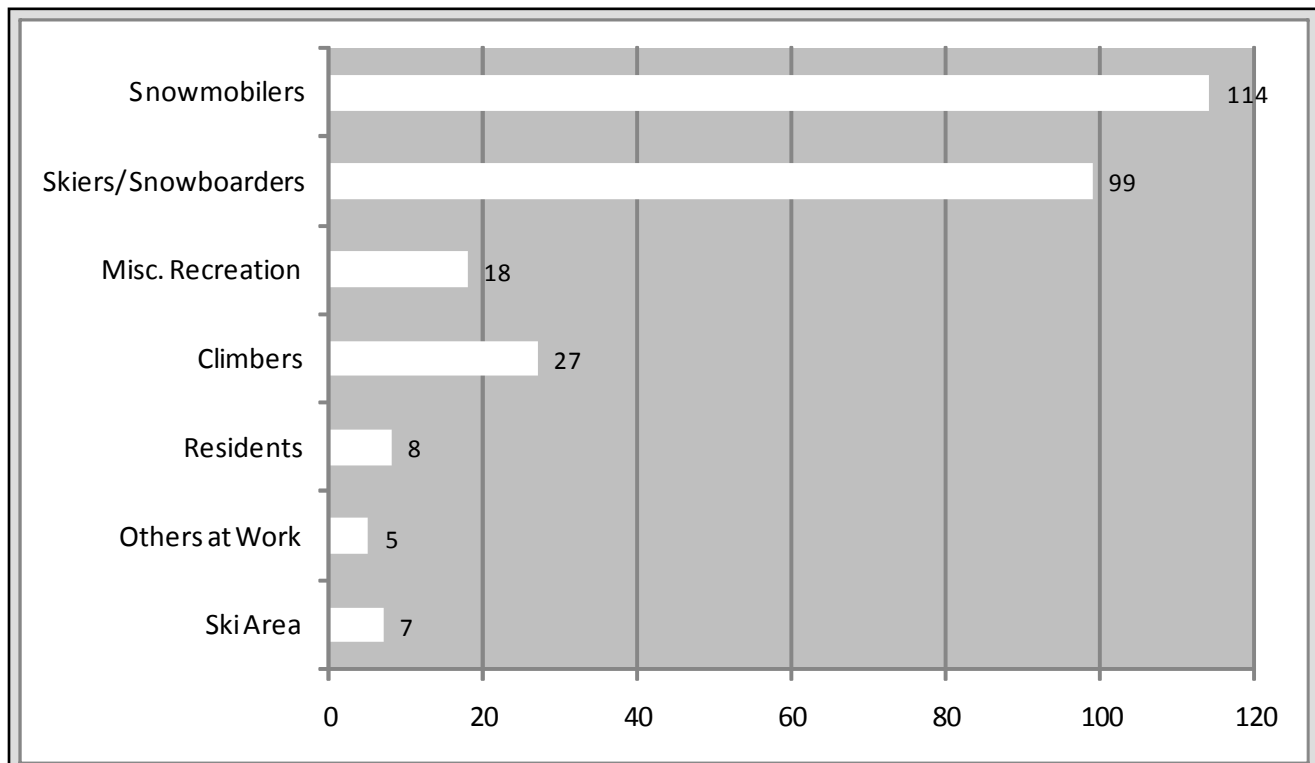
- ◆ 45 people were buried elsewhere on the Gallatin National Forest. Four skiers were killed, four climbers died, and four snowmobilers died.

2010-11 US Avalanche Fatalities: 22

14 skiers/snowboarders; 4 snowmobilers; 2 climbers; 1 worker; 1 misc.			
Date ▲	State	Location	Description
04/28	AK	Ruth Gorge	Icefall avalanche hits camp, 1 climber killed
04/26 †	CA	Split Mountain, south of Bishop	2 skiers caught and killed
04/18	AK	Bird Ridge, Chugach State Park	Solo snowplayer caught, buried, and killed
04/16 †	WY	Garnet Canyon Meadows, Grand Teton National Park	2 backcountry tourers caught, buried, and killed while camped
04/04	CO	Highlands Ridge, Desolation Row, Aspen zone	1 skier caught and killed
03/27	WA	Back country to the west of Stevens Pass, WA. Backside of Cowboy Mountain	1 snowboarder caught, partly buried, and killed
03/26	UT	Horsehoe Mountain	3 skiers caught, 1 partly buried, 1 partly buried-critical and killed.
03/19	AK	Hatch Peak, Hatcher Pass	2 skiers caught, 1 injured and 1 killed
03/05	WA	Mount Cashmere	1 skier caught and killed
02/22	CO	East Snowmass Creek Valley, Sand's Chute	1 Skier caught, fully buried, and killed
02/20	CO	Sand Peak-Flat Tops	1 snowmobiler caught, buried and killed
02/14	MT	Truman Gulch, Bridger Range	1 snowboarder caught, buried, and killed
02/01	WA	Red Mountain, Snoqualmie Pass Washington	1 skier on foot caught, buried and killed
01/17	CO	"High Trail Cliffs," northeast of Berthoud Pass	1 snowboarder (and dog) caught, buried, and killed
01/08	MT	Near Hungry Horse Reservoir, east of Kalispell	3 snowmobilers caught, 1 killed
12/29	ID	20 miles northeast of Calder	1 snowmobiler caught, buried, and killed
12/05	CO	Dry Gulch-East of Eisenhower Tunnel	2 skiers caught, 1 partially buried, 1 buried and killed
12/04 †	WA	Morning Star Peak, north central Washington Cascades	1 climber caught, partially buried, and killed
11/26	UT	Cherry Hill, western Uinta Mountains	1 snowmobiler caught and killed
11/22	CO	Wolf Creek Pass Ski Area, Glory Hole Point	Ski patroller caught, buried and killed

Graph & Table of US Fatalities by Activity: 10 Years

ACTIVITY	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	10-winter totals
climbers	3	5	4	5	0	0	2	1	5	2	27
skiers/ snowboarders	11	11	6	15	8	9	11	5	9	14	99
in-area skiers/riders	0	0	0	2	0	0	1	3	1	0	7
snowmobilers	18	14	6	4	12	10	13	16	17	4	114
misc. recreation	3	0	4	2	3	1	4	0	0	1	18
residents	0	0	3	0	0	0	2	1	2	0	8
others @ work	0	0	1	1	0	0	0	1	1	1	5
Total	35	30	24	29	23	20	33	27	35	22	278



Finances and Fundraising

The Gallatin National Forest supplies the Avalanche Center with 60% of its funding, amounting to \$92,000. This covers all benefits, travel, vehicles, office computer support and other miscellaneous costs, plus 65% 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

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. This season their entire contribution totaled \$34,000.

MONTANA FISH, WILDLIFE AND PARKS, RECREATION TRAILS GRANT

Montana Fish, Wildlife and Parks continues to be a strong outside supporter of our avalanche program. This winter we were awarded \$33,400, our 12th year receiving a Recreation Trails grant. A huge thanks goes to Steve Gilbert and Beth Shumate at FW&P for their continued support.

GALLATIN COUNTY SEARCH AND RESCUE

Gallatin County SAR has been the Avalanche Center's partner since we started 21 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.



Touring above the clouds outside Cooke City.

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 GNFAAC at our current level we need outside funds.

The Friends were founded in 1992. Since then, they've donated over \$216,000 to the GNFAAC. Most of the monies came from local businesses and individuals in southwest Montana.



Standing on hard slab debris.

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, Lance Riek, Chris McQueary, 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 \$24,012 this winter. This includes, payroll, liability insurance, lodging, teacher supplies, bacon checkers and a beacon park.

GNFAAC 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, and fees to professional workshops. This totaled \$2,894.
- ◆ 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 1,300 miles on each of the two Nytro four-stroke sleds. The Friends paid for maintenance, insurance, and repairs which totaled \$3,798.
- ◆ Hyalite Weather Station. The Friends purchased a remote weather station which was placed near Flanders Peak in Hyalite Canyon. Mark Staples set it up early in the winter and it fed us a steady stream of data all season. This cost \$3,300.

Friends of the Avalanche Center

Where the money comes from:

POWDER BLAST

We held our 12th Powder Blast on October 29th at the Emerson Cultural Center. For \$30 folks got dinner, music, drinks and tables of silent auction items to bid on. We sold almost 250 tickets and raised \$17,600! This event is the season's single largest fund raiser for the Friends.

BRIDGER BOWL: KING AND QUEEN OF THE RIDGE

Bridger Bowl held the 9th King and Queen of the Ridge on February 12th. Individuals and families hiked laps on the ridge for pledges. All proceeds went to our avalanche education program. This year 40 competitors raised \$2,235 for the Friends which will be used for next



Skier triggered slide in S. Madison Range.

years classes. Since the first King and Queen in 2003, Bridger Bowl has helped raise \$89,135!

HANS SAARI MEMORIAL FUND

For the fourth year in a row the Hans Saari Memorial Fund awarded the Friends a grant for their education programs. They generously donated \$2,000 which was put to use this past winter. Hans was a local skier, writer and friend who died in 2000. His name and spirit live on through the fund.

PINHEAD CLASSIC

Once again, Paul Neubauer and Warren Bauer organized the 29th Pinhead Classic telemark festival and raised \$1,250 for the Friends. Over the years the Pinhead Classic has raised \$14,750 for us! A new board is grabbing the reigns since Paul and Warren are stepping down after decades of volunteering.

MONTANA ALE WORKS

Albert McDonald and Dawn Brown organized the third annual fundraising dinner for the Friends on March 1st. Tapas style servings paired with local beer from Lone Peak Brewery allowed 100 people to mingle, socialize and support the Friends. The restaurant donated all the staff and food, plus generously gave the Friends all the ticket sales which totaled \$2,500.

YELLOWSTONE CLUB

The Yellowstone Club Community Foundation is supporting us for the second year in a row with another \$5,000 grant. This is the fifth winter that the Club has supported our opera-

Friends of the Avalanche Center

tion. Tom Leonard, Ski Patrol director, has been instrumental in helping us secure these grants.

GALLATIN RESOURCE ADVISORY COMMITTEE (RAC)

The Friends were awarded \$5,000 from RAC to further avalanche education in Gallatin County. Specifically, the monies were used to purchase Beacon Checkers, Beacon Parks, signage and run education classes.

OTHER DONATIONS

Many people contribute to the Friends of the Avalanche Center. Pamela Anderson Wallace donated \$4,000 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 Big Sky Ski Patrol gave us \$350 and the Gallatin Valley Snowmobile Association sent us \$233 from their annual poker ride. Additionally, all the avalanche classes raised \$9,200 in donations which helped offset their costs.



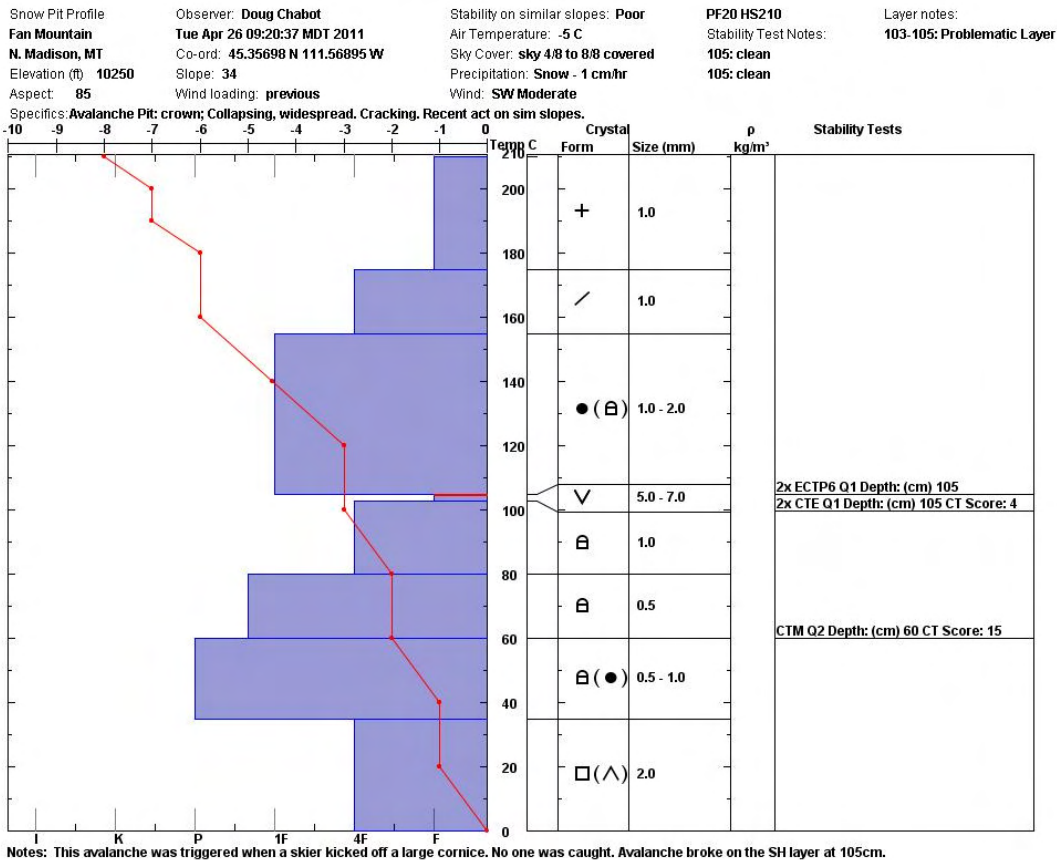
Digging a snowpit near Lionhead in the southern Madison Range.

SnowPilot



We developed SnowPilot (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 the 5,000+ snowpits recorded from all over the world for their studies while general users can keep personal snowpits archived online. This past winter SnowPilot adopted the new International Classification for Seasonal Snow on the Ground and formatted the data to the new CAAML standard. With these updates SnowPilot will remain useful for all snow professionals and recreationists. And best of all, it's FREE.

We started posting all our snowpits on our website too. People can now look at our detailed snowpit and stability test analysis and we encourage folks to submit their own.



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 \$41,600. These donations reflect a dollar estimate of what it would cost to hire people or buy/rent equipment.

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
NRCS	\$3,600
Volunteer observers	\$7,000
Field volunteers (600+ hours)	\$10,000
TOTAL	\$41,6000

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.

NORTHERN LIGHTS TRADING COMPANY

Mike Garcia, owner of Northern Lights Trading Company, has supported the Avalanche Center since its start 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 volun-

teers. Over 60 individuals give us their snow and avalanche observations on a regular basis. Beau Fredlund in Cooke City saved us days of work with his accurate and frequent assessments. Mason Young also fed us a regular information from the Madison Range. We are also thankful for the combined efforts of Bridger Bowl, Big Sky, Moonlight Basin and Yellowstone Club Ski Patrols. Lucas Zukiewicz at the NRCS gave us valuable assistance. Also the Snow Rangers on the Gallatin National Forest gave us detailed backcountry snowpack information.

Budget

Income

Montana FW&P Rec Trails Program

◆ RTP 2010 \$31,830

Gallatin County Search and Rescue \$4,000

FW&P Snowmobile Safety \$3,000

Friends of the Avalanche Center

◆ Avalanche Education Program \$24,012

◆ Administrative Support \$2,894

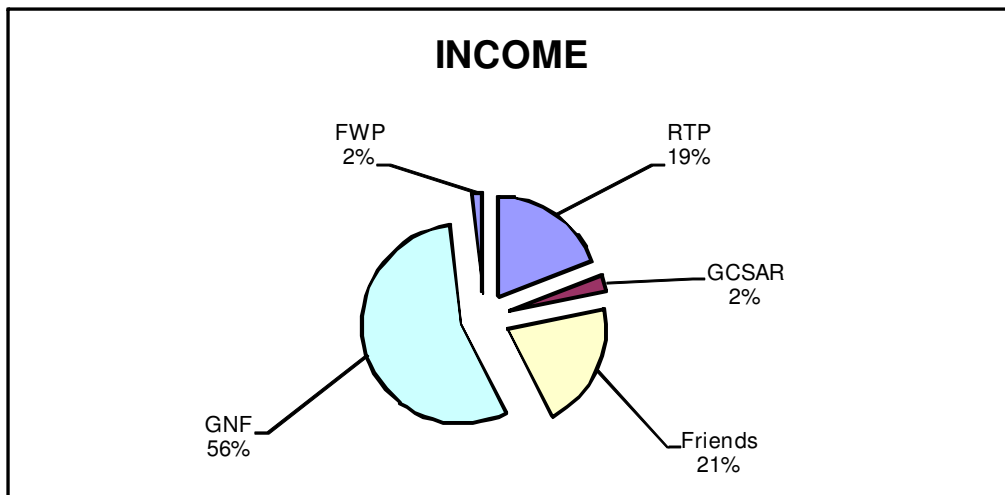
◆ Snowmobile expenses \$3,798

◆ Hyalite Wx Station \$3,300

TOTAL CASH CONTRIBUTIONS \$72,834

TOTAL GALLATIN NATIONAL FOREST CONTRIBUTION \$92,150

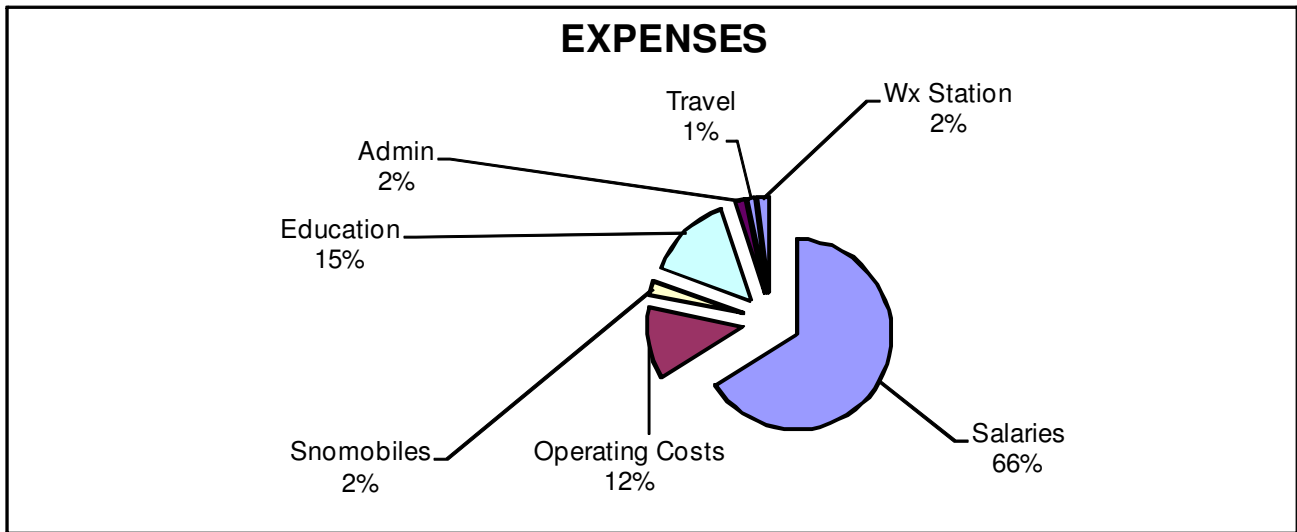
TOTAL INCOME \$164,984



Budget

Expenses

Salaries/OT/Benefits	\$108,980
GNF operating costs	\$20,000
Travel/OT	\$2,000
Snowmobiles equip/maintenance	\$3,798
Education	\$24,012
Administrative costs	\$2,894
Hyalite Wx Station	\$3,300
<hr/>	
TOTAL EXPENSES	<\$164,984>



Seasonal Weather Summary

Unlike many seasons in Montana with early dustings of snow and cold weather by Halloween, this season's early snow melted during a warm, extended fall. One big storm in late October was followed by nearly continuous snowfall which started in the second week of November.

Extreme, depth hoar forming, cold weather came twice before New Years, but the snowpack was already deep and dense which provided a solid defense against the cold. The first bout of below zero temperatures occurred on November 24th, but there was already over 6 inches of SWE on the ground in the Bridgers and over 9 inches of SWE near Cooke City. With



Looking at a crown in the Bridger Range.

a solid base of snow and only two days of cold weather, the snowpack remained strong. By the time more cold weather came the snowpack had a strong foundation. Although extremely cold weather was fleeting this season, many days experienced temperatures in the single digits and teens F. Under these temperatures some faceting occurred mostly in areas with relatively thin snowpacks. Fortunately these facets required a very large load to create an avalanche. Numerous and large storms finally provided the right load, and a short avalanche cycle occurred in the 3rd week of January. Following even bigger even bigger

storms, a few large, cornice triggered avalanches occurred at the end of March/beginning of April.

During a few breaks in snowfall, several weak layers formed at the snow surface. Most of these were either short lived or produced surprisingly little avalanche activity. Around December 5th surface hoar formed throughout the advisory area but was mostly destroyed by strong winds except near Big Sky where this layer was capped and preserved by new snow. This layer produced one accident on January 6th in Beehive Basin where a snowboarder triggered an avalanche and was swept into a tree which broke her snowboard. There were few avalanches on this surface hoar which finally ceased to be a problem with no more incidents. Another weak layer formed at the end of January. Initially it seemed to be a widespread problem but mostly existed in the Northern Gallatin Range. Two weeks later this layer showed signs of some increased strength. Another week later this layer ceased to be a prob-

lem. A similar story occurred further south when a faceted layer formed and was buried near Teepee Basin, then quickly healed.

There were no extended periods of dry weather to form persistent and widespread weak layers. With stormy weather the primary avalanche issues were new snow and wind-blown snow. There were many strong and extended wind events which formed hard wind slabs throughout the advisory area while scouring windward slopes to the ground. Unfortunately, an avalanche fatality occurred on the west side of the Bridger Range following one of these wind events on February 14th. This avalanche involved a dense wind slab in a cross loaded gully. Strong wind events continued into March when the avalanche danger spiked with each storm creating a prolonged period of MODERATE to CONSIDERABLE avalanche danger. By April most SNOTEL sites were reporting an above average snowpack with snow still falling. Winter refused to leave without a fight. By April 5th, measureable precipitation had occurred on 72% of the days in the southern half of the advisory area and 65% of the days in the northern half. A LOW danger in at least one area was rated on certain terrain for 45% of the season. Considering that the LOW rating was never issued anywhere last winter, this season was one to remember.



Deep Pow.