

# ANNUAL REPORT 2022/23



**Flathead  
Avalanche**



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# Flathead Avalanche

is a partnership providing daily forecasting  
and avalanche education in Northwest Montana

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We are a partnership between the US Forest Service and a non-profit community group. Our mission is to provide life-saving information for winter recreationists.

The Flathead National Forest Avalanche Center (FAC) operates out of the Hungry Horse Ranger Station in Region One. We are one of 22 regional avalanche centers and one of 10 USFS Type 1 Avalanche Centers in the US issuing a daily avalanche advisory.

The Friends of the Flathead Avalanche Center (FOFAC) is a 501c3 organization focused on funding, education programming, and community outreach. We are guided by a volunteer community Board of Directors.



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*Fulfilling our mission involves daily collaboration between FAC and FOFAC. This organizational structure, shared by most avalanche centers in the U.S., can be confusing for the public. Our solution is the streamlined Flathead Avalanche "partnership brand," an efficient, holistic way to present ourselves. Our audience already recognizes the name as our website URL and social media handles.*

[FLATHEADAVALANCHE.ORG](https://flatheadavalanche.org)

# The Flathead

Our watershed, forest, forecast area, and classroom



We issue daily forecasts for three zones, covering 1.2 million acres

1. Link Mountain Weather Station
2. Whitefish Mountain Resort
3. Canyon Creek Trailhead
4. GNP closed the Lake McDonald zone for infrastructure projects during the 2022/23 winter
5. Hungry Horse Ranger Station
6. Tunnel Ridge Weather Stations
7. Aeneas Ridge Weather Station

# 10,000 Foot View

Fulfilling our mission to provide  
life-saving information

↗ **146**

Days with  
forecast products

↗ **2,115**

Education participants





*Blase tours in the southern Whitefish Range*

# Welcome

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**Blase Reardon, FAC Director**

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More observations, more forecast products, more students in FOFAC's avalanche classes, more FOFAC-driven community events, more financial support, more weather station infrastructure... Amidst these positive developments, it's easy to overlook the fact that a regional avalanche center's work is ultimately intangible yet serious: saving lives. The winter of 2022-23 saw no accidents with grave consequences, so perhaps the FNF and FOFAC succeeded in their shared mission.

Yet things could all-too-easily have been different. Even with our work, a rider could still be struggling to recover from life-changing injuries. Our community could be grieving deeply. A few seconds or a few feet might have made for different outcomes in the season's reported near misses and incidents. Conversely, seemingly casual conversations might have kept a party off a slope primed to slide, and off the list of near-misses and accidents.

We can and should acknowledge the seriousness of the winter's business, and the role of chance in our apparent success. We can also recognize that the dice were more likely to roll our way thanks to the efforts of our community and organizations. Thank you to the many individuals who did their best to ride safely each day, and to FOFAC, for their dedication to growing our infrastructure and support. And for those efforts, all of us can be proud and grateful.

# Flathead National Forest

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**Protecting the public on the Forest**

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Since 1994, 82% (14 out of 17) fatal avalanche accidents in the Flathead forecast region have occurred on FNF lands. A similar pattern plays out across the country. Avalanches kill more people on NFS lands than any other natural hazard. Forest Service Avalanche information and education centers are guided by Forest Service policy (Forest Service Manual 2357) and national leadership from the Forest Service National Avalanche Center.

To mitigate avalanche hazards to forest visitors, the Flathead National Forest (FNF) operates the Flathead Avalanche Center. Since 2014, a Challenge Cost Share agreement has enabled FOFAC to support the center's forecasting, the [flatheadavalanche.org](http://flatheadavalanche.org) website, education programming and safety efforts. The partnership makes it possible for the FAC to operate as a USFS Type 1 Regional Avalanche Center that provides daily avalanche forecasts.

FNF contributions to the partnership include funding for many equipment purchases and most of the forecaster wages. The FNF also provides vehicles, several snowmobiles and a trailer, staff laptops, and IT and administrative support. Less tangible support includes all the resources of a large federal agency, such as the Public Information Officers who help publicize Watches and Warnings.

The FAC is guided by staff at the FNF Supervisor's Office: Deputy Forest Supervisor Tami McKenzie, Partnerships Coordinator Tad Wehunt, and Recreation program Manager Chris Prew, who directly supervises the program. A big thanks to to the Hungry Horse District Fire program and administrative team, as well as FNF Executive Assistant Ivy Gehling.

# FAC Team

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Meet our team of avalanche specialists

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Issuing daily avalanche forecasts is labor-intensive, particularly for a large, remote region like the Flathead. This season, the Flathead National Forest added an additional seasonal forecaster position to the center, bringing the team to six. A wholehearted welcome to our two new forecasters, Rob Millspaugh and Sarah Williams!

Five team members work full time during the winter and write the daily forecast. Our sixth member, Avalanche Technician Guy Zoeller, works part-time, focusing on fieldwork and verifying forecasts. The team relies on volunteers for our daily fieldwork. These partners put in long days, often in bad weather and not-great conditions, to help us stay safe and collect observations. Thank you for your generosity and expertise!



Blase Reardon  
*Director*



Mark Dundas  
*Lead Forecaster*



Cam Johnson  
*Forecaster*



Rob Millspaugh  
*Forecaster*



Sarah Williams  
*Forecaster*



Guy Zoellner  
*Avalanche Technician*



# Operational Partners

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## Our closest collaborators

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These partners make significant financial or time contributions to our mission as well as daily operations. Thank you for your support!

An inter-agency agreement allows Glacier National Park and Flathead Avalanche to support each other's operations. GNP contributes significantly to the FAC's annual budget, and the FAC provides technical assistance and education to GNP staff, including an avalanche Level 1 course. GNP forecasters for the Going-to-the-Sun Road also contribute valuable spring observations.

FAC relies on data from three high-elevation automated weather stations maintained by the USGS (Snowslip, Sperry, and Garden Wall). USGS Scientist Erich Peitzsch also assisted with the installation of the Link Mountain station installation. FAC supports the USGS Sperry Benchmark Glacier Mass Balance Program with fieldwork.

David Hamre & Associates (DHA) is a Platinum-level sponsor and an avalanche safety consulting firm that provides BNSF Railway (BNSF) with an avalanche safety program in John F. Stevens Canyon (JFS Canyon). DHA forecasters conduct field observations related to avalanche, snowpack, and weather as part of the BNSF program. They share their observations collected with the FAC. DHA forecasters maintain a network of automated weather stations in JFS Canyon and assisted the FAC with repairs to the Tunnel Ridge station this season. Data from the BNSF stations is publicly available online and utilized by the FAC for avalanche information products.





# Hi, friend!

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**Emily Struss, FOFAC Executive Director**

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We don't measure the success of our season only by dollars raised, number of products, or even fatalities avoided. Ultimately, we're driven to deepen the quality of connection we have with our winter users. We know we're succeeding when we see people taking avalanche safety to heart and when we see the culture deepening.

Our three-person FOFAC team really hit our stride this winter. Cheers to our Education Director, Meg Killen, and our Communications Manager, Clare Menzel, for all the progress we've made in evolving and refining our programs. We were thrilled to welcome Ted Steiner as FOFAC president this fall, who has hit the ground not just running, but in a full sprint! We are so grateful for his leadership and experience in the avalanche industry. As always, we were guided and supported by our dedicated Board of Directors and sub-committees. Thank you as well to the FAC team for their tireless efforts to provide the community with relevant, nuanced information about avalanche conditions.

With the help and support of community members, non-profit partners, local businesses, and industry sponsors, we had our best year yet. Donations and corporate sponsorship make this magic happen—it's an all-hands-on-deck effort. We cannot thank this community enough for the ways you show up and invest in safety.

Keep reading to learn more about how we made an impact on our winter safety in the Flathead area this season. We are so grateful for you, your support, and your stoke.

*Emily celebrates with a winner during the Friends Fest Big-A\$\$ Raffle*

# FOFAC Team

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**We are a friends group that does so much more than fundraising**

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We are a small, tight-knit staff guided by our regional community of recreationists through the volunteer board. This was Meg and Emily's fourth winter together, and our second year with Clare on the team. On our board, we have representation from local winter industry stakeholders as well as recreational users and those passionate about avalanche safety.



TOP: (L-R) Clare, Meg, and Emily. All smiles, as always, after installing the Grey Wolf Beacon Park at WMR  
BOTTOM: (L-R) Zak, Lloyd, Ted, James, Woody, Chris, and Emily. May 2023 BOD meeting.

## **Board Members**

Ted Steiner, President  
Ronald "RB" Bachrach, VP  
Zak Anderson, Secretary  
Woody Hust, Treasurer  
Jenny Cloutier  
Lloyd Morsett  
Ed Visnovske  
Mikaela Bourrett (new!)  
James Heckman (new!)  
Chris Prew (ex officio)  
Blase Reardon (ex officio)

## **Executive Committee**

Ted Steiner, Roland "RB" Bachrach, Woody Hust, Zak Anderson

## **NRSAW Committee**

Lloyd Morsett, Erich Peitzsch, Amy Moore, Zach Armstrong, Chelaine Keyser, Jenny Cloutier, Blase Reardon, Emily Struss, Clare Menzel

## **Education Committee**

Jenny Cloutier, Ed Visnovske, Meg Killen, Emily Struss

## **Development Committee**

Zak Anderson, Emily Struss, Clare Menzel

## **Braap Committee**

Ted Steiner, Woody Hust, Lloyd Morsett, Emily Struss

# 22/23 Sponsors

Thank you for your commitment to avalanche safety



Literally one million thank-yous would not be enough for our corporate sponsors, whose support is essential for avalanche forecasting and education. It is both humbling and motivating to see many of these businesses return year after year. Without you and your unwavering support, we could never have grown into the organization we are today. Thank you to our 2022/23 diamond sponsors: Black Diamond Mortgage Corporation, Dream Marine & Ski-Doo, Fresh Life Church, Two Bear Air Rescue, and Whitefish Mountain Resort.

*If you are interested in becoming a 2023/24 corporate sponsor, contact [emily@flatheadavalanche.org](mailto:emily@flatheadavalanche.org) for our sponsorship benefits package.*



*Rob inspects snow crystals while forecasting the Whitefish Range*

# Avalanche Season

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## A summary of 2022/2023 snow and avalanche conditions

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**12**

Reported  
Near-Misses  
or Accidents

**5**

Days with  
High danger

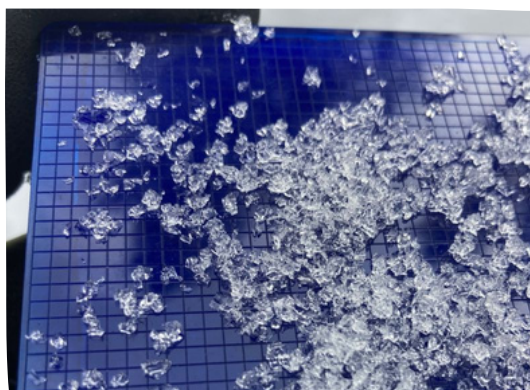
**43**

Days with at  
least one D2 or  
larger reported

**D3**

Largest slides  
reported

This winter was notable for an abrupt and early start and a pattern of atmospheric rivers followed by arctic outbreaks. The combination gave the Flathead Valley 121 days with continuous snow on the ground (Nov. 20-Mar. 21), one of the top 10 longest streaks on record. Yet the mountains ended the season with about 90% of median Snow Water Equivalent, thanks to a storm pattern that favored areas south of the forecast region. The most widespread avalanche cycles occurred around Christmas and in late February, both prompted by warm storms that brought rain to mid and upper elevation slopes. The crusts and ice left by the Santa Soaker storm spared the region from a potentially deadly winter plagued by basal weak layers, as happened just north in British Columbia. Nonetheless, the FAC recorded 12 near-misses and avalanche incidents. Most occurred in early December and early April and involved faceted snow on crusts. Fortunately, no one was fully buried or seriously injured in these events.



L-R: (1) Cam at the crown of the Krause Creek avalanche on 2/19 (2) Depth hoar from the bottom of a Paola Creek pit in mid-February (3) Mark's gear in front of a 6-foot crown in the Flathead Range in March. The hard slab avalanche failed on weak snow near the ground on a wind-loaded slope

# October & November

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**An abrupt, snowy start to our La Niña 3-Peat**

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Heading into the season, the talk was about what conditions a rare, third consecutive La Niña winter would bring. Record snowfall? Bitter cold? The first three weeks of October were memorable for splendid fall weather: dry, mild, and sunny days. This extended fall ended abruptly on October 21, when a cold, wet storm system swept in from the Pacific. Upper-elevation weather stations recorded below-freezing temperatures for the first time in weeks, along with five to 12 inches of snow. The weather remained cool and wet for the rest of the month.



*Our first incident of the year involved a storm slab above Beaver Pond below Ghoulie Point.*

More storms in the first week of November doubled the snow cover across the region, enabling access to upper elevations. That week saw our first reports of human-triggered and natural avalanches. The roughly two weeks of cold, dry weather that followed set the stage for a series of near-misses and incidents.

Strong temperature gradients weakened the shallow snowpack. By November 21, the snowpack on many mid-elevation slopes consisted of depth hoar, large-grained facets, and hard, melt-freeze crusts. Basal weak layers like this are atypical at mid-elevation terrain in the Flathead Region; they're more common at upper elevations, in terrain often beyond the reach of Flathead area recreationists in the early season.

During the last week in November, temperatures moderated briefly and heavy snowfall created a slab above the weak snowpack. The instability was obvious. Parties reported widespread collapsing and cracking on facets below the slab in the Whitefish and Swan Ranges on November 23. This structure was present on November 27 when a skier in the southern Whitefish triggered a small, soft slab avalanche that carried him for 20 feet before he was able to shuffle out of the slowly moving debris and duck behind a tree. This was the first reported avalanche incident of the season and one of the earliest the FAC has recorded.

# December

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**First Santa's naughty, then he's nice**

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More incidents, near misses, remotely triggered slides, shooting cracks, and collapses made it clear that early-season conditions were atypically hazardous for northwest Montana. On December 1, in Noisy Basin in the Swan Range, a snowmobiler triggered a soft slab on a road cut that produced surprising amounts of debris and left him partially buried. The next day, skiers climbing the east route at Whitefish Mountain Resort (not operating at the time) watched a solo skier trigger a slab on a steep, east-facing slope. The debris almost caught the rider, but he was able to exit the slope. In response to the conditions, the FAC started issuing forecasts on December 3, almost a week earlier than planned. Reports of whumping collapses, shooting cracks, and soft slab avalanches continued for 10 days, proving “the layer was still a player.”

The third—and coldest—Arctic outbreak of the season arrived December 17. By December 22, temperatures had plunged well below zero, with most stations recording air temperatures of -25 to -40 degrees. Accompanying the bitter cold were one to two feet of low-density new snow and moderate to strong southerly winds. The FAC bumped the avalanche danger to Considerable. The region saw the first widespread natural avalanche cycle of the season, with reports of at least four D3 avalanches during the cycle.

However, the cold temperatures and powder were gone within two days, scoured out by an atmospheric river that doused the mountains with one to five inches of precipitation from December 23 to 28. The FAC raised the danger to High for the last three days of this period. Much of the precipitation fell as rain below about 7200 feet as air temperatures warmed 40 to 65 degrees. Once the rain-soaked snow surface refroze, supportable crusts and ice layers capped the early-season facets and depth hoar. That almost eliminated the likelihood of people triggering slides on those layers, and the FAC had only one report of an incident involving these layers the rest of the season. Meanwhile, the Columbia and Rocky Mountains in Canada—missed by the Santa Soaker atmospheric river—saw the deadliest avalanche season in two decades. Nearly all of the fatal accidents there involved basal facets and crust combinations like those that plagued the Flathead Region early season.



# January

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**Stable, mid-winter blower? Please and thank you**

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*TOP: In early Jan, heavy rime was widespread above 6800' in the Flathead Range  
BOTTOM: A rime crust forming on 1/18 was buried overnight in the vicinity of WMR*

2023 started with five to 12 inches of low-density snow sitting above the crusts and ice layers left by the Santa Soaker storm. And “sitting” it was, because the first few days of the year saw remarkably light winds, even at ridge crests. By January 3, the FAC was rating the avalanche danger as Low at all elevations across the region. Many riders took advantage of the rare combination of stability and quality snow to summit and ride peaks or more committing lines.

Snow began accumulating again the second week in January, though it mostly favored the southern reaches of the forecast region, a common trend this season. The Noisy Basin SNOTEL in the Swan Range recorded 4.5 inches of SWE between January 9 and 19. Other stations, however, received just 0.7 to 1.8 inches.

The storm track shifted north briefly at the end of the month, delivering 1.7 to 2.0 inches of SWE to WMR and Noisy Basin. The FAC bumped the avalanche danger to Considerable or High in the Flathead and Swan zones. The snow quickly shut off as another incursion of arctic air arrived, bringing strong to extreme winds and more sub-zero temperatures to the region.

# February

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## High winds, arctic air, and a spate of near misses

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Temperatures warmed the first week in February, but wind speeds also climbed. Upper-elevation stations recorded moderate to strong southerly winds with gusts of 50 to 70 mph. The winds scoured some slopes down to older ice crusts while depositing dense wind slabs on many slopes. One of these released on February 5 above a party skinning near Skiumah Lake in the Flathead Range, catching two riders. The riders suffered minor injuries and lost some gear.

February 17 to 21 saw another atmospheric river sweep across the region. With 1 to 3 feet of new snow falling on the forecast region, the FAC issued an Avalanche Warning and raised the danger to High. On many slopes, the storm snow fell on drifted snow or old snow weakened by the January and February dry spells. February 19 saw two avalanche incidents. In the Apgar Range, the last skier in a group of five triggered a soft slab avalanche that caught and pinned the rider against a tree. In the Swan Range, a FAC forecaster was caught and knocked off his feet by a small soft slab triggered by his partner.



TOP: Fern Creek near miss debris pile  
BOTTOM: Diagram of Skiumah near miss

True to form for this season, arctic air followed the storm, bringing more bitterly cold temperatures as well as good visibility. Observers reported numerous debris piles and crowns from a cycle of large and very large natural avalanches that ran during the storm, in the season's second widespread avalanche cycle.

# March

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## A mix of extreme and benign weather

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March came in like a roaring lion, with strong southwesterly winds gusting over 60 mph on March 2. The winds easily moved around the recent storm snow, depositing large loads on leeward slopes. While the FAC expected some large natural avalanches during and after the wind event, the size of the slides surprised us. The loading was enough to trigger several very large (D3) natural avalanches that released on weak snow near the ground or around the Christmas and January crusts.

A near-miss in the Ten Lakes area on March 8 demonstrated the feast/famine difference in snowfall between the southern and northern reaches of the forecast region. A snowmobiler triggered a slab that, while less than two feet thick, released on basal depth hoar on an upper elevation, easterly slope.



*Investigating the Ten Lakes avalanche. This is the thinnest part of the crown, where we suspect the slide was triggered from.*

On March 19, a near-miss on the eastern edge of the forecast region illustrated how hard it can be to account for all variables related to avalanche hazards. A party on Red Crow Mountain near East Glacier was surprised by a large hard slab avalanche that appeared to have recently run on a route they were considering descending. From tracks nearby, they concluded that mountain goats had triggered the slide.

A mid-month wind event recorded the highest gusts of the winter: 69 and 71 mph at Snowslip and Aeneas Ridge, and 100 mph at Tunnel Ridge. Following that event, March went out like a lamb. With relatively benign weather from March 20 to 31—light snowfall, mild temperatures, and moderate winds—the FAC rated the danger as Low across the region (apart from two days at upper elevations in the Swan Range). This dry spell left a variety of weak snow surfaces across the region, including near-surface facets and facets above crusts.

# April

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## A sudden end to the riding season

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April started with what's becoming a recurrent theme: a cycle of triggered avalanches that surprise experienced riders. April Fools avalanche cycles have now occurred in three of the past four seasons, all involving similar conditions: reactive soft slabs that break on persistent weak layers left by late-March dry spells.

Snow surfaces proved very reactive when buried with just 0.5 to 0.8 inches of SWE on March 31 and April 1. On April 2, numerous parties reported unintentionally and remotely triggering soft slab avalanches. The FAC recorded one near miss in Crystal Creek and two incidents, also in the Flathead Range. While the avalanches did not have deep crowns, they propagated widely, with one in Pinnacle Creek 600 feet across. This slide knocked a



*The April Fools cycle strikes in Pinnacle Creek*

FAC forecaster off his feet and carried him a few yards downslope. A second, in Wahoo Creek, broke 150 feet wide and carried a snowboarder about 75 feet. Neither rider was buried or suffered injuries. This layer remained reactive on isolated slopes for the next week, with another near miss reported near Marion Lake on April 8. That brought the season's tallies to 12 reported near misses and accidents that caught five riders and left three of them partially buried and slightly injured.

The FAC stopped issuing daily forecasts on April 10, transitioning to two to three times per week conditions updates. However, snowfall continued as a series of closed lows spun south of the forecast region. Wraparound moisture delivered over 4.5 inches of SWE to the Swan Range during the second half of April, while northern areas again remained mostly dry. Warm, sunny weather in late April brought the curtain down on the season. Significant melt on mid- and upper-elevation slopes made access difficult. At upper elevations, a widespread wet snow and glide avalanche cycle occurred, documented by the forecasting team for the Going-to-the Sun Road in the last observation of the season on May 1.



*Sarah travels alongside fresh debris from Wet Loose slides on a mid-elevation, northwest aspect in the Flathead Range in late April*

# Danger Ratings

## Describing the likelihood, size, and distribution of expected avalanches

The FAC issued 270 products that included a danger rating for one or more zones during the 2022-23 winter, a record high in nine winters.

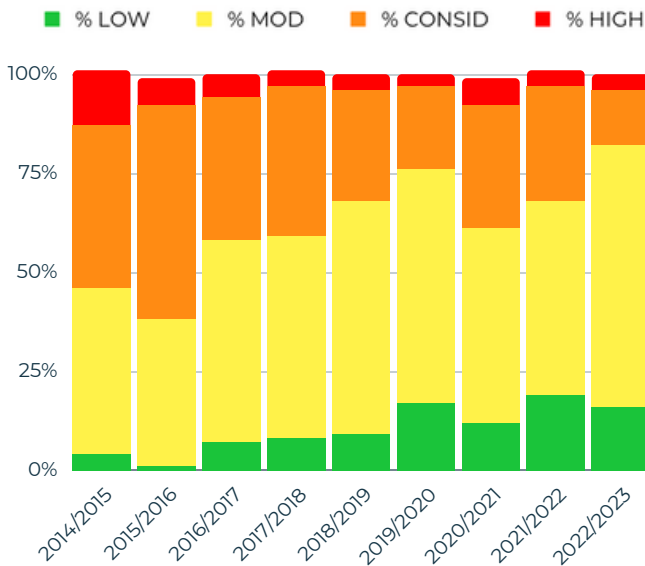


Figure 1: Colors represent the percentage of total products issued with a given rating for each season since 2014/15. Total number of products per season varies from 95 (2015) to 270 (2023).

This spike resulted from different conditions between zones, with the northern reaches of the region generally drier. Moderate was by far the most common rating (179 products, 66%). Low was second-most common (44 products, 16%), in line with the past three winters. FAC issued by far the least Considerable ratings in the last nine winters (37 products, 14%). Typically, this ranges from 21 to 54% of the total. FAC issued a typical amount of High danger ratings (10 products, less than 5%).

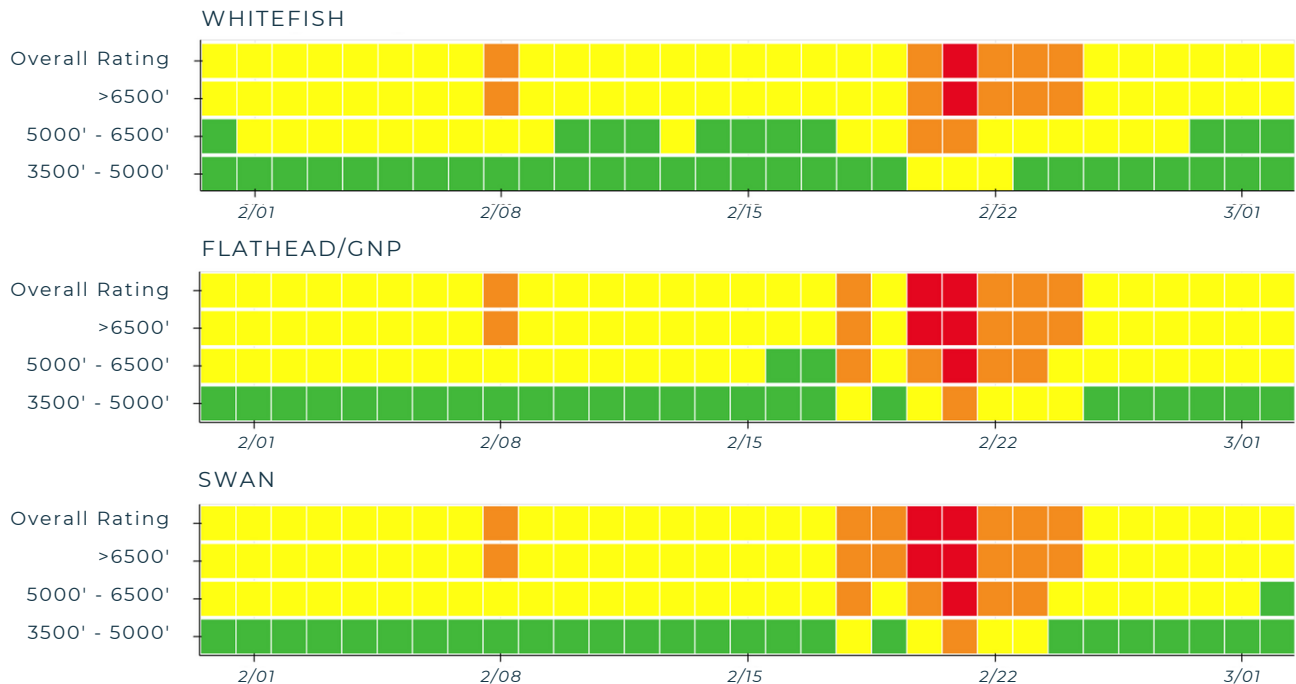


Figure 2: A snapshot of daily danger ratings for our forecast zones from 2023. The chart shows how the danger ratings can vary across the region and within different elevation bands in a zone.

# Incidents, Accidents & Near Misses

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**We are grateful to report zero serious injuries or fatalities**

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Early- and late-season events bookended the 2022-23 winter. FAC received reports of 12 events. Fortunately, riders in the Flathead Region did not sustain serious injuries or fatalities in any of the winter's events.

We classified five events as near-misses, including a large avalanche triggered by mountain goats on a slope adjacent to a party in Glacier National Park. Riders were caught in moving debris briefly in four incidents; two of the slides were large (D2) and occurred on the same day (April 2). FAC forecasters were involved in two of these incidents, yet another demonstration of Andre Roch's aphorism: "The avalanche, it does not know you are an expert."

In the remaining three accidents, riders were caught, carried and came to a rest partially buried by the debris:

- On December 1, a snowmobiler triggered a slab on a road cut near Camp Misery in the Swan Range. His partner helped dig him out from a surprising amount of debris.
- A skier and snowboarder were caught and carried while setting an uptrack in Skiumah Creek on February 5. Both suffered bruising and other minor injuries.
- The last skier in a group was caught and pinned against a tree in the Apgar Range on February 19. That rider also suffered minor injuries.

Most of the avalanches in these events were large (D2), with the largest classified as D2.5. All but one occurred on a slope that faced northeast, east or southeast. The mean elevation was 6500 feet, which is the boundary between mid- and upper-elevation bands.

Through our accident reports and this summary, the FAC aims to document what happened when things went wrong, in hopes readers can learn lessons that will keep them safer. We're thankful to those who reported events and corroborated details. This information is invaluable.

Date	Site/Zone	Outcome	D Size	Aspect/ Elevation	Activity/Mode of Travel	Rating at elevation of event
11/27	Beaver Ponds/ Whitefish	Incident/1 Rider caught	1.5	NE/6500	Ski	None
12/01	Camp Misery/ Swan	Accident/1 snowmobiler partially buried	1.5	NE/5800	Snowmobile	None
12/02	Haskill Slide/ Whitefish	Near Miss	2	E/5900	Ski	None
02/05	Skiumah Creek/Flathead	Accident/2 riders partially buried	2	NE/5125	Ski and Snowboard	2
02/19	Fern Creek/ Whitefish	Accident/1 rider partially buried	2	SE/6000	Ski	2
02/19	Krause Creek/ Swan	Incident/1 Rider caught	1.5	NW/6550	Ski	3
03/07	Ten Lakes/ Whitefish	Near Miss	2	E/7600	Snowmobile	2
03/18	Red Crow Mtn/ Out of region	Near Miss	2.5	SE/7700	Ski	N/A
04/02	Pinnacle Creek/Flathead	Near Miss	2	NE/6600	Ski	2
04/02	Wahoo Creek/ Flathead	Incident/1 rider caught	2	NE/6400	Ski	2
04/02	Crystal Creek/ Flathead	Incident/1 rider caught	2	NE/6200	Ski	2
04/08	Repeater Ridge/ Flathead	Near Miss	2	NW/6850	Ski	2

Figure 3: 2022-2023 Incidents, accidents, and near misses. These numbers reflect all of the incidents that people reported to us. Where possible, we confirmed details with at least one member of the party involved. Undoubtedly, there are other near-misses or accidents that go unreported.

## TYPES OF OUTCOMES

**Near Miss:** An unintentionally-triggered slide in which no one was caught but which had a high potential for burying, injuring or killing someone should something have gone differently

**Incident:** Any time a rider comes into contact with moving avalanche debris

**Accident:** A person is partially or fully buried, injured, or killed by an avalanche



### EVENTS BY OUTCOME, 2017-2023

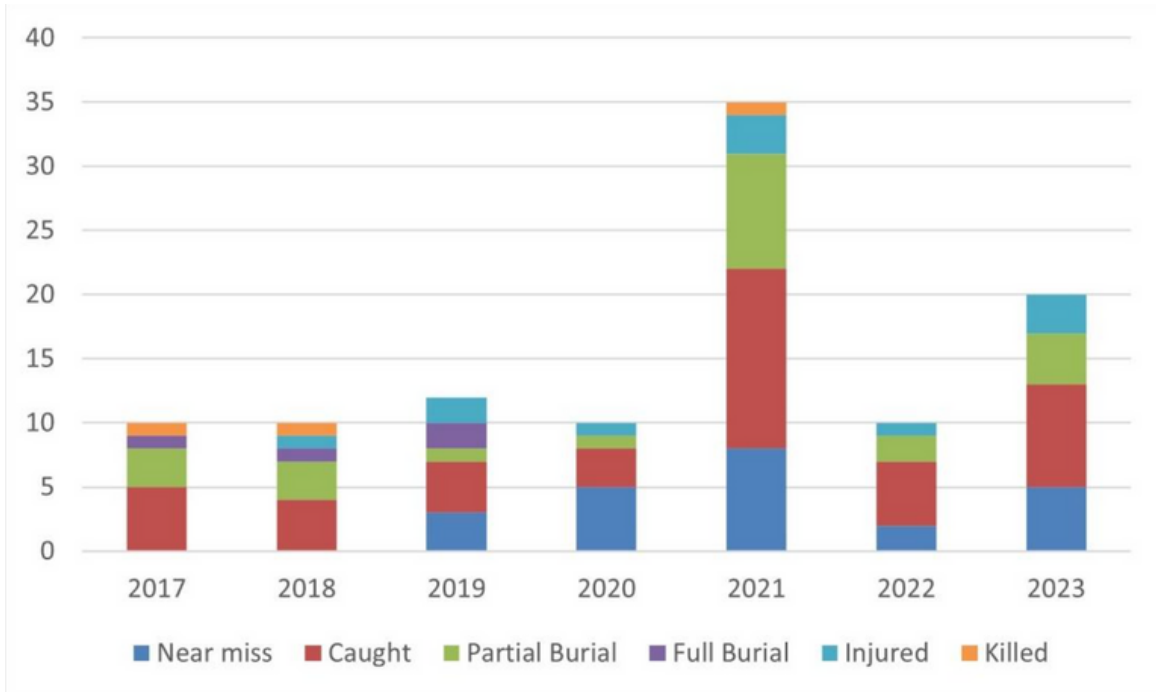


Figure 4: In the 2023 winter, the FAC received the second highest number of reports of near-misses or accidents, though the tally remains much lower than 2021. Note that in this graph, the bars represent the total number of people involved in near-misses, incidents, and accidents.

### EVENTS BY DANGER RATING, 2017-2023

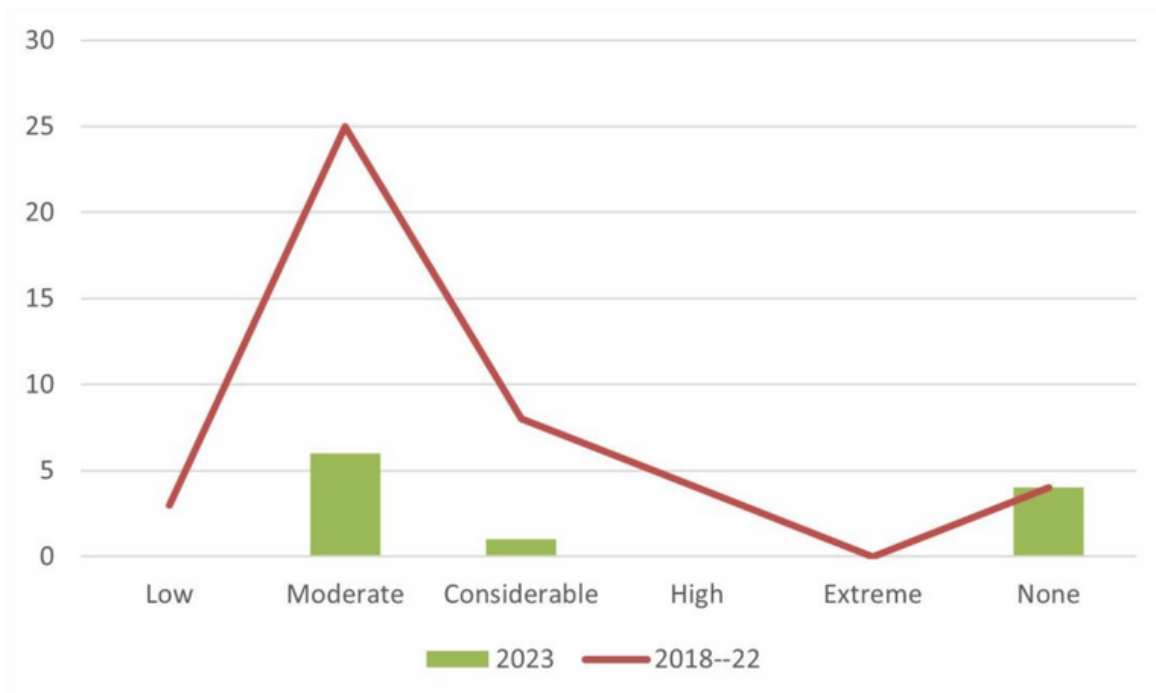


Figure 5: Near-misses and accidents by danger rating in 2023 (green bars) compared to totals for the 2018-22 winters (red line). As is typical, most incidents occurred when the FAC rated the danger as Moderate. This winter's late-November and early-December incidents happened prior to the start of the FAC's daily forecasts.

## EVENTS BY SETTING 2017-2023

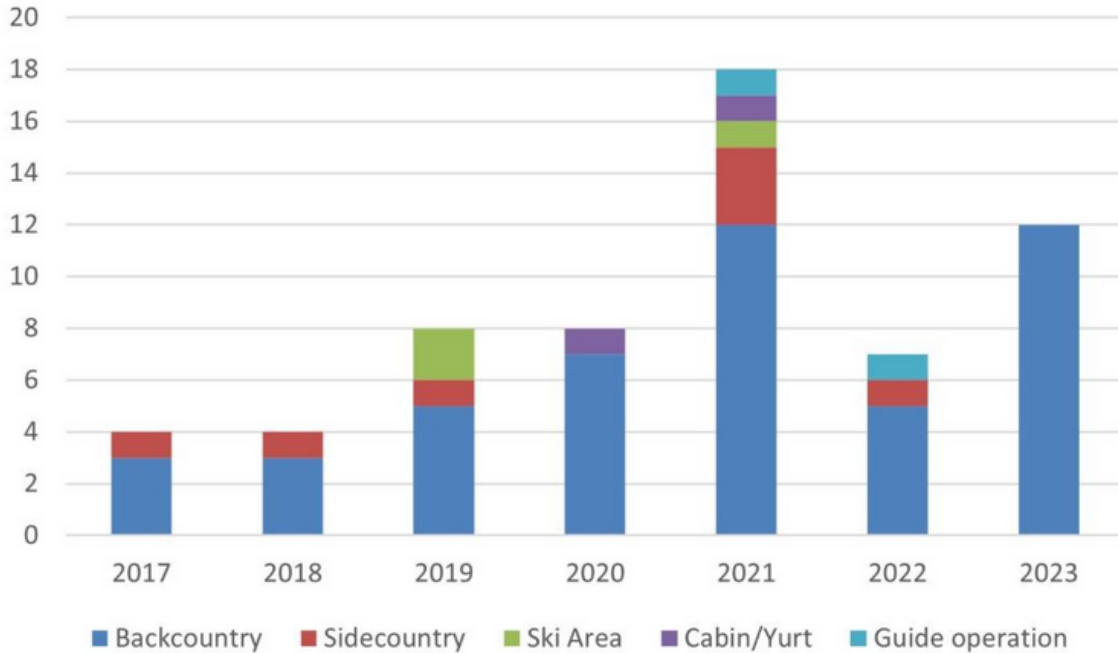


Figure 6: Unlike recent winters, the 2023 incidents occurred exclusively in the backcountry, meaning that riders accessed avalanche terrain from a roadside trailhead. The other settings describe terrain within a ski area or mechanized guiding operation, or terrain accessed by leaving a ski area for adjacent terrain or from a backcountry cabin or yurt. Two of the 2023 incidents occurred before the ski area was operating, in terrain that would otherwise be classified as Sidecountry or Ski Area.

## EVENTS BY FORECAST ZONE, 2017-2023

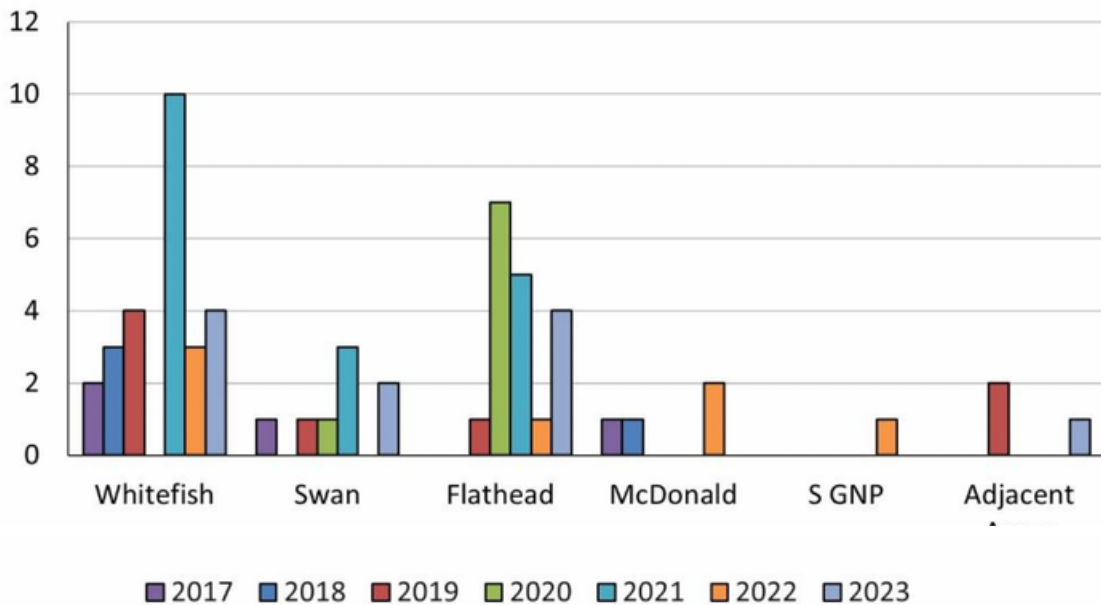
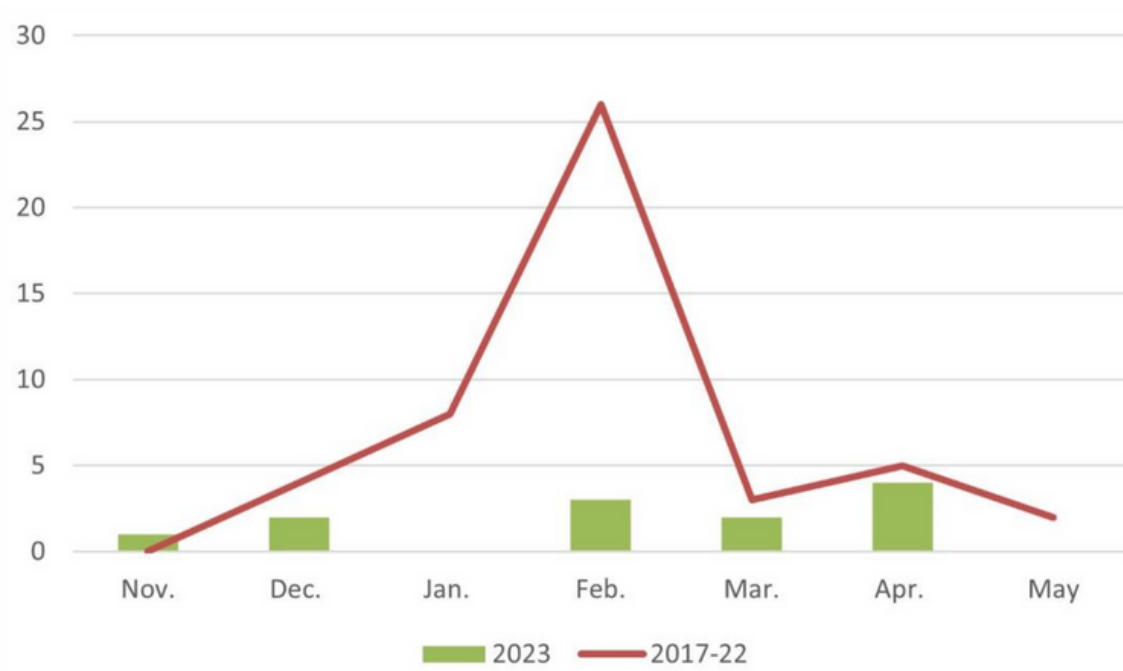


Figure 7: Reported near-misses and accidents by forecast zone for the 2023 winter. Most incidents (eight of 11) occurred in the Whitefish and Flathead zones. The parts of Glacier National Park included in the Flathead forecast region are split between two zones. The Apgar Range, where one accident occurred in the 2023 winter, is included in the Whitefish Forecast zone. Both the Lake McDonald and Southern Glacier National Park areas are covered by the Flathead Zone forecast. The Lake McDonald area was not open for the 2023 winter.

## EVENTS BY MONTH, 2017-2023



*Figure 8: Reported near-misses and accidents by month for the 2023 winter (green bars) compared to totals for the 2017 through 2022 winters (red line). A near-miss in late November 2023 marks the first recorded incident in that month in the 2017-23 period. 2023 also saw a cluster of accidents in early April, a pattern that's become increasingly common in recent winters.*



*LEFT: The crown of a hard slab avalanche on Elk Mountain tapered down to 18" thick in the rocks. We believe this is where the avalanche was triggered. RIGHT: Goat-triggered avalanche on Red Crow Mountain*

# Infrastructure

## Weather stations, snowmachines, and beacon parks

4

Our  
Weather  
Station  
Network

For an avalanche center and education program, “get the gear” is a little more complicated than just having a beacon, shovel, and probe.

2

Polaris RMKs

One of the strengths of our public-private partnership is FOFAC's ability to secure funding from the community, businesses, and granting partners for strategic infrastructure investments. FOFAC development supports weather stations, beacon checkers and training parks, and snowmachines, as well as routine maintenance and improvements for these resources.

1

Enclosed  
Trailer

We are always looking for growth opportunities. This year, we expanded the Forest Service weather station network into the central Whitefish Range, secured a grant for a new beacon park lower on Canyon Creek, and formed a FOFAC Braap Committee to oversee snowmobile procedures and care, as well as other aspects of our shared infrastructure. Our future goals are to acquire an additional snowmachine and a truck.

1

Public  
Beacon  
Park (soon  
to be two!)

6

Youth avy  
packs



L-R: (1) Flathead Helitack assisted with the Link Mountain Weather Station installation, (2) We appreciated the loaner Dream Marine Ski-Doo Summit (3) Beacon park at the summit of Whitefish Mountain Resort

# Weather Stations

**Achieving our goal to expand our network into all three forecast zones**

For our forecast team, automated weather stations (AWS) are like headlamps in the dark. The data they provide are invaluable for visualizing conditions in terrain that’s otherwise obscured or inaccessible, particularly in the early morning hours when we’re determining how conditions have changed overnight, and assessing how the coming day’s weather is developing. When the FAC started operations in 2014-15, data from the three forecast zones was very limited. We have since made a concerted effort to develop a network of AWS at upper elevations across the forecast region, with the goal of having at least one in each of the three forecast zones. In the past five years, we made significant progress with investments nearing \$100,000.

Station	Year Installed	Primary Data
Link Mountain, Central Whitefish Range at Red Meadow Pass	2022	Wind speed and direction, air temperature
Tunnel Snow (Pinnacle Creek)	2020	Snow height, air temperature
Tunnel Ridge Wind (between Paola and Pinnacle Creeks)	2020	Wind speed and direction, air temperature
Aeneas Ridge, Swan Crest, Jewel Basin	2019	Wind speed and direction, air temperature
Whitefish Mountain Resort Summit	2014, upgraded in 2021	Wind speed and direction, air temperature, snow height, precip

Figure 9: Flathead Avalanche AWS network

When the Link Mountain weather station went live in early September, 2022, it filled a critical data gap in an area with a history of fatalities. Thank you to the Avalanche Alliance and the Yamaha Outdoor Access Initiative for the financial support to make it possible to purchase and install the station.

With our goal of installing at least one station in each zone achieved, the FAC is now focused on maintaining and upgrading existing stations. Our first priority is rebuilding the Tunnel Ridge Wind station. Its mast was severely damaged in late October, 2022. In February, the FAC and our partners at the BNSF avalanche program temporarily repaired the tower, putting the station back into service. However, a lasting repair will require replacing the mast altogether. We hope to complete that repair this summer. Other work includes upgrading the wind station at Aeneas Ridge with a stronger, more durable mast and cross arm, and calibrating sensors that are approaching their service dates at all stations. All stations are now transmitting data via cell phone modems.



*Ted Steiner at the Tunnel tower repair*

Our installations and maintenance simply would not be possible at the current scale without the generous help of Dan “Howie” Howlett of NoHow Inc. Howie designs and builds the FAC stations and monitors the data network, upgrading programs, adjusting schedules, alerting us to problems, and responding promptly to our urgent, sometimes panicked calls. Thank you for your unique expertise and generosity.

Other wizards include Dr. John Snook of the Colorado Avalanche Information Center, who created and maintains our weather station table, and Patrick Wright and Tobey Carmen of Inversion Labs, who created and maintain our Snowpack Tracker page. A big thank you as well to Two Bear Air Rescue and Flathead Helitack for their work safely delivering awkward, heavy loads to high places.



# Snowmachines

Essential gear for fulfilling our mission

Snowmobiles are an essential tool for the FAC forecasters, allowing us to reach far-flung terrain in the region's large and diverse forecast region. Fieldwork in these areas helps us to provide forecasts that are relevant to our large community of motorized riders. Capable mountain sleds also enable FOFAC to offer field course for motorized riders in appropriate terrain. We typically put 1,200-1,500 miles a season on our fleet of snowmachines.

The backbone of the fleet are two 2018 Polaris RMKs owned by FOFAC, nicknamed "Peitzsch" and "Hannon." These supplement two older FNF sleds. FOFAC also provides an enclosed trailer to transport the machines. For each of the the past three seasons, BRP and Dream Marine have loaned Flathead Avalanche brand new mountain sleds. The loaners—"Guy"—are a blast to ride!



A stop-ride notice in fall 2022 had a major impact on our programs.

We received new fuel pumps in late January, putting the FOFAC RMKs back in use. We're grateful to the team at Polaris who jumped into gear to expedite the process.



AUSTIN SEBACK

Rob forecasting in the Whitefish range

# Forecasting

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## How the FAC produces and communicates avalanche safety info

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**128**

Days with forecasts

**270**

Total products with a danger rating

**302**

Total advisory products

**1,203**

Total motorized miles

Daily avalanche forecasts are the foundation of our avalanche safety messages and education. Based on recent observations, they outline current conditions, offer travel advice, and describe approaching weather and changes in hazards. Students in our classes learn how to use these products effectively and our outreach often aims to draw people to the daily forecasts. Every morning at 7 a.m., we publish the forecast on our website, which received an average of 500 daily visits this winter. We issue different forecasts for each zone, but combine zones when conditions are similar. Each product uses a tiered structure so users can access a level of information and details appropriate to their interest, time, and expertise.

But this is just the tip of the communications iceberg. We also email the bottom line—a concise summary of the day's hazards—to more than 700 subscribers, an audience with a 57% open rate. This winter, FAC staff also appeared in local news media, national podcasts, and other outlets 10 times. And with videos from the field, we package information in an appealing, accessible format.



L-R: (1) In mid-Feb. wind stiffened snow popped off easily with a burp test, but did not propagate in ECTs (2) Faceting snow buried in the snowpack in early April (3) Volunteer Burket Kniveton inspecting the crown of a slab that failed on a persistent weak layer formed around a mid-Jan. crust



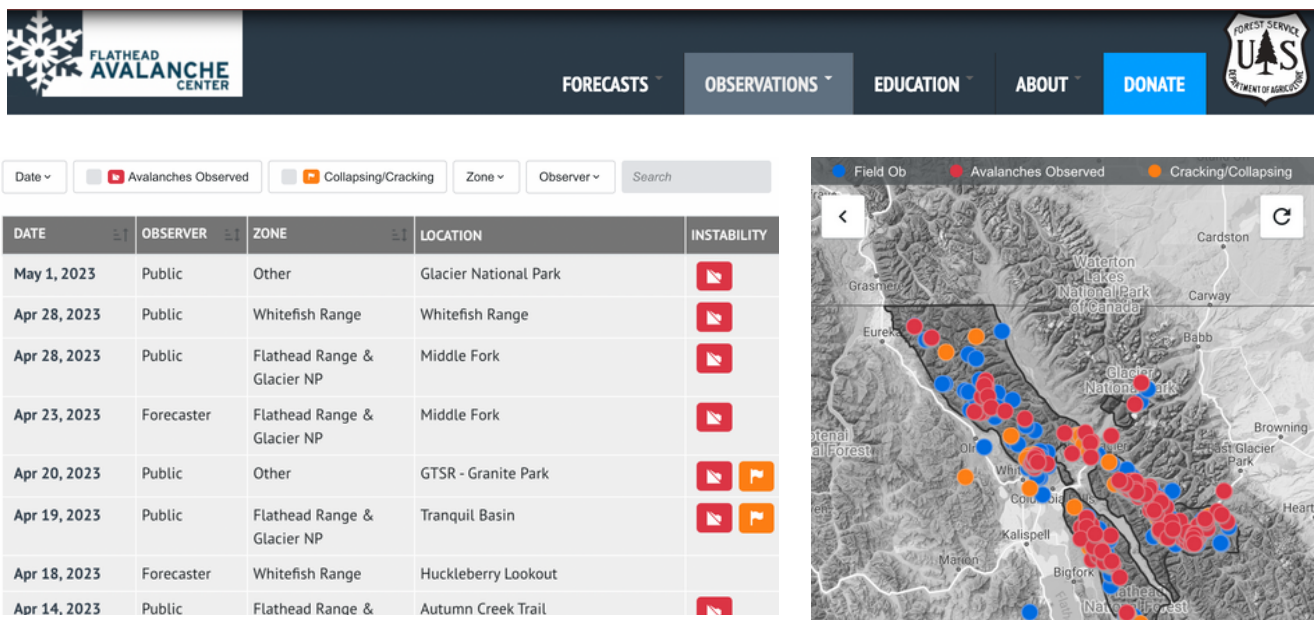
# Observations

**A new web platform resulted in record-high contributions from the public**

Field observations—the lifeblood of any center— help validate predicted avalanche activity, alert forecasters to snowpack and weather variations, and ultimately enable forecasters to provide accurate descriptions of avalanche hazards. They are especially important in the Flathead, because the topography and weather (those clouds!) obscure start views of start zones and avalanche paths. The FAC is fortunate and very grateful to have an active and dedicated community of riders who submit reports of the conditions they’ve experienced on a given day.

In the 2022-23 winter, the FAC logged a total of 574 observations. The public and partners submitted 428 (75%) of those. This represents a 23% increase over the previous winter, as well as the largest total in the past eight winters. 142 individuals submitted observations to the FAC, up 46% from the previous winter.

We ascribe these exciting increases to the integration of a new online observation platform developed by the USFS National Avalanche Center. It simplifies the process of submitting a report: all the entry fields are on a single page instead of multiple tabs, and the platform has reduced the number and complexity of required and optional fields. Attaching multiple images is also markedly easier. Filtering functions make it easy for users to find relevant observations.



The screenshot displays the Flathead Avalanche Center website interface. At the top, there is a navigation bar with links for FORECASTS, OBSERVATIONS (selected), EDUCATION, ABOUT, and DONATE. The OBSERVATIONS section is active, showing a log of observations and a map of the Flathead region with markers for Field Observations (blue), Avalanches Observed (red), and Cracking/Collapsing (orange).

DATE	OBSERVER	ZONE	LOCATION	INSTABILITY
May 1, 2023	Public	Other	Glacier National Park	
Apr 28, 2023	Public	Whitefish Range	Whitefish Range	
Apr 28, 2023	Public	Flathead Range & Glacier NP	Middle Fork	
Apr 23, 2023	Forecaster	Flathead Range & Glacier NP	Middle Fork	
Apr 20, 2023	Public	Other	GTSR - Granite Park	
Apr 19, 2023	Public	Flathead Range & Glacier NP	Tranquil Basin	
Apr 18, 2023	Forecaster	Whitefish Range	Huckleberry Lookout	
Apr 14, 2023	Public	Flathead Range &	Autumn Creek Trail	

A screenshot of the new-and-improved observations log front end.

The number of observations submitted by FAC staff (146) remained similar to those from the past two seasons (151 and 152). The recent tallies are down from 2019’s high of 201, which represented 45% of that season’s submitted observations. The decrease is due to illnesses, injuries, and other duties that sidelined forecasters during the winter, as well as the demands of producing weekly conditions summaries. Each summary typically keeps at least one forecaster from the field for a day each week.

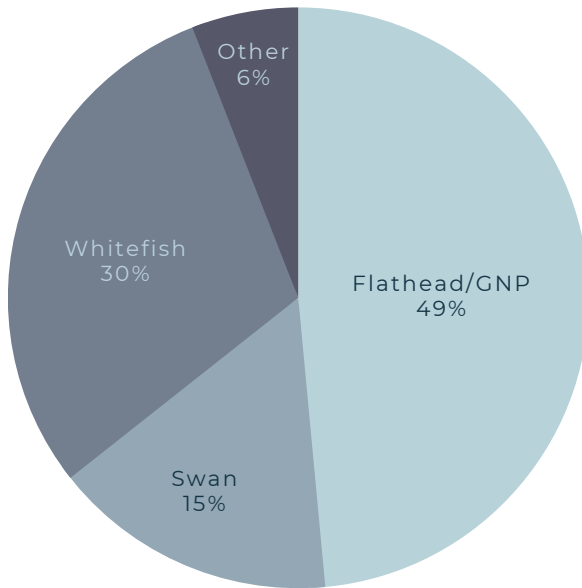


Figure 10: Percentage breakdown of 2022/2023 observations by zone. In 2021/2022, the Flathead Range/GNP also took the lead with 51% of observations.

The majority of our observations are from male skiers, and we are working to diversify our pool of contributors. This winter, at least 31 public observations (22%) were from women, submitting 57 (13%) observations, a slight increase over last winter. Very few of this season's observations (17; 4%) came from motorized riders (not including those those who use motorized transport for ski/snowboard access). We continue to examine and address barriers that inhibit people from submitting observations.

Season	Total Obs Logged	% Change	Forecaster Obs	Partner & Public Obs	% Public & Partner
22/23	574	15%	146	428	75%
21/22	500	-3%	152	348	70%
20/21	517	5%	151	366	62%
19/20	491	9%	184	307	55%
18/19	451	14%	201	250	63%
17/18	394	74%	148	246	71%
16/17	203	7%	61	142	70%
15/16	189	-	73	116	74%

Figure 11: Tallies comparing the 2022-23 winter to past seasons

Special thanks to snow workers in our region, including Ted Steiner and Adam Clark of BNSF Railway and Dave Hamre Associates; Lloyd Morsett and the ski patrol at Whitefish Mountain Resort; Charles Hlavac and Mike Maierhofer at Teton Pass Ski Area; and Erich Peitzsch, Zach Miller, Gabrielle Antonioli, and John Hageness of the USGS/GNP Going-to-the-Sun Road program. Thank you for sharing your expertise.

The FAC is fortunate and very grateful to have an active and dedicated community of observers. Our Outstanding Observers contributed 253 field reports, 60% of the public/ partner obs. Kevin Oberholser submitted the most observations (23), while Kim Givler was our top woman observer (7) and Pete Costain our top motorized observer (9). We would also like to acknowledge Tom Whipple with our Forecaster's Choice Award. Tom helped with the Tunnel Ridge weather station rebuild (twice), assisted forecasters in the field, and submitted many high-quality observations. Public observations demonstrate a substantial investment of time and energy, and the FAC offers a heartfelt thank-you to each contributor.



TOP: Tom Whipple  
 BOTTOM: A-Team observers Jackson George, Kody Coxen, and Josh Lanney

15+ Observations	Adam Clark, Chris Gotschalk, Kevin Oberholser, Jackson George, Zach Miller, Alex Slader
10+ Observations	David Steele, Burket Kniveton, Tom Whipple, Jacob Malkin, Josh Lanney
5+ Observations	Pete Costain, J Mills, Jake Frerk, Jay Sandelin, Kim Givler, David Kerner, Joel Anderson, Sara Boilen, Northwest MT Adventures, Paul Fotter

Figure 12: Three cheers for these dedicated public observers!

# Products

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## Daily advisories and conditions updates

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We started issuing daily forecasts on December 3, a few days earlier than usual, and continued until April 9. That 128-day period is slightly longer than the average of 122 days for 2015 to 2023 winters. This winter's 146 days of products is about typical for the past eight seasons. The total number of products (302) includes the days when we issued early and late-season conditions summaries with no ratings (18) and weekly conditions summaries (14). Both of those tallies are typical of recent seasons. However, FAC issued 270 daily forecasts, a notable jump from recent seasons and a total well above the largest previous tally (2020; 252). The spike results from different conditions developing and persisting in the three forecast zones, which led FAC to issue forecasts with different avalanche problems or dangers for the zones more often than usual.

Season	First product	Start Daily Forecast	End Daily Forecast	Last Product	Days of Daily Forecast	Total # of Products
22/23	11/6	12/3	4/9	4/28	128	302
21/22	11/10	12/6	4/10	5/27	125	177
20/21	10/19	12/9	4/11	5/21	123	183
19/20	9/22	12/7	4/5	4/23	119	258
18/19	10/12	12/9	4/6	4/15	118	198
17/18	10/2	12/9	4/8	4/15	120	205
16/17	10/9	12/5	4/9	4/30	125	143
15/16	10/28	12/9	4/10	4/11	123	152
14/15	10/29	12/6	4/5	4/5	120	110

Figure 13: Tallies comparing this winter to previous seasons

# Financials

Here's what it takes to run the center

In the 2022-23 winter, the FNF provided most (62%) of the funding for FAC forecasting and field operations. The second largest contributor (21%) was the State of Montana via a grant from the FWP's Recreational Trails Program. These two sources fund the salary costs for the Program Manager and forecasting team. Glacier National Park also provided significant funding (11%), which we use for both salaries and equipment purchases. Funds from USFS Region 1 pay for additional equipment purchases. This season's funding also includes a significant contribution from the Flathead Hotshots, who assisted with the installation of the Link Mountain Weather Station in August.

Sources	
Flathead National Forest wages	\$135,000
USFS Region 1	\$10,000
MT RTP Grant	\$45,000
GNP	\$23,000
Flathead Helitack (in-kind)	\$3,200

Figure 14: FAC funding contributions and expenses, 2022/2023

# Contributions from FOFAC

The non-profit arm of Flathead Avalanche is adaptive and strategic

Complex partnerships centered around the US Forest Service can require adaptability from their non-profit counterparts. Each year, FOFAC has very little idea how the center will need our support until the season arrives. But when needs arise, we're a nimble organization with the ability to be responsive, flexible, and creative. This is one of the major strengths of our "Agency and friends group" style partnership.

FOFAC has three main areas of fixed expenses: education programs, forecast support, and staff time, including admin costs. In addition, we invest time and resources in certain special focus areas each year. As we round the corner to our tenth year, we are working with our committees, granting partners, and other donors on a handful of major infrastructure projects including the website revamp project and critical weather station repairs.

ANNUAL CONTRIBUTIONS	
FOFAC Education Program	\$35,000
Forecasting: Website, snowmachines, field supplies, operations support, and more	\$25-40,000
FOFAC Staff time: Direction, development, education, communications, admin	\$55-65,000
2022/2023 INVESTMENTS	
Link Mountain Weather Station	\$25,000
Repairs for Tunnel and Aeneas Weather Stations	\$5,000
Flatheadavalanche.org renovation, underway. Coming fall 2023!	\$25,000

Figure 15: FOFAC fixed expenses and special investments



*Snowpit joy in a youth class with Meg Killen at WMR*

# Education

## Preparing students for informed backcountry decision-making

**9**

Public field courses

We're celebrating a record-breaking 2,115 students this winter! But all the credit really goes to our community for their engagement in avalanche education.

**620**

Youth from 17 schools

This was a season that gave us a little bit of everything. We went from teaching motorized courses in sub-zero temps to sharing sunscreen in our ladies human-powered intro. We were excited to shift back to mostly in-person classes and workshops, and hosted a new, four-day festival in February. The community showed so much interest in education that we added a new intro class mid-season and filled the roster.

**506**

Hot dog winners

**259**

11th annual NRSWA audience

Thank you to our excellent instructors for their knowledge and mentorship, our students for their endless curiosity, and our sponsors for supporting avalanche education.

**231**

Avalanche Awareness attendees

— Meg Killen, FOFAC Education Director



L-R: (1) Meg in the classroom (2) A group of students after beacon practice (3) Meg, Jenny, and Emily at FNBP Hot Dog Days



# November

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## 11th Annual Northern Rockies Snow & Avalanche Workshop

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We kicked off the season with 250 stoked folks back at the O'Shaughnessy Center in Whitefish for an afternoon of workshops on November 11:

Joel Shehan (Physical Therapy for a strong, healthy season—and lifetime), LeeAnn Allegretto (NW MT Winter 21/22 in review and 22/23 preview), Jake Hutchinson (When things do go wrong... how a little critical thought, a few shortcuts, and better practice will make you a more effective and efficient companion rescuer), Simon Horton (Comparing avalanche seasons: Do more dangerous conditions result in more fatalities?), Matt Hansen (Burying the Lede: Lessons learned from a Career of Writing about People and Avalanches, and our panel on regional avalanche programs: Adam Clark (BNSF), Lloyd Morsett (WMR), and Blase Reardon (FAC), Erich Peitzsch (USGS), with moderator Keagan Zoellner (WMR).

We also organized a new Pro Night at White Raven Winery in Columbia Falls as an opportunity for local snow and avalanche workers to mingle and discuss more technical and operational topics. Sixty-five workers joined us for the following presentations, which were very well-received:

Zach Miller (Snow Depth Variability and implications of Avalanche forecasting), Jake Hutchinson (30 Years of Balancing Exposure, Risk, and Operational Goals in a Wicked and Ruthless Learning Environment), Gabrielle Antonioli (A3 Resilience Program), Simon Horton (Importance of Snow Depth Data for snowpack modeling for forecasting), and Matt Hansen (How to get the story right, and other near misses of a media pro).

# Education Summary

**Avalanche courses, community workshops, and more**



The Monday after NRSAW, we rolled right into our Avalanche Awareness series. Meg and FOFAC Board President Ted Steiner gave free, hour-long talks based on the Know Before You Go Program. We spread these six talks out across November, December, and January, with stops across the region in Kalispell, Coram, Eureka, Bigfork, Kalispell, and Whitefish. We also gave four private awareness talks to sponsors and other partners.



*TOP: Avalanche Awareness at Bias Brewing  
BOTTOM: Beacon practice at the Canyon Creek Trailhead during the SAR course*

We rode the stoke wave into our first State of the Snowpack at the Tap House. This was a new opportunity for forecasters to present in-person on current avalanche conditions. We added this element to many of our workshops and events throughout the season, and plan to do so again next winter.

As with most years, our first field courses in December were private Level 1s with local land agencies and first responders. We were glad to have the FAC team lead these courses and make important connections with other professionals. Sarah Williams led the course for North Valley and Flathead County SAR teams; Rob Millspaugh led our guides and rangers course for local guide companies, along with a few USFS employees, and NPS employees; and Blase Reardon led the Glacier National Park winter training. FOFAC Education Chair Jenny Cloutier pitched in, as did FOFAC board member Woody Hust. Woody helped with five courses this winter, specializing in motorized instruction.

In mid-December, an arctic intrusion greeted our first public field course with bitter cold, but the ladies layered up and practiced partner rescue skills with great vigor at the summit of Whitefish Mountain Resort. Thank you to Kim Givler, Cat Berro, Brittany Eppard, and Jenny Cloutier for your ability to create a good learning environment. We hosted another human-powered partner rescue clinic at the end of January, and want to recognize our instructors Paul Fotter, Tim Strand (FSCAR, FNBP), Jackson George (FNBP), and for lending their expertise.



*Students in our partner rescue clinics practice strategic shoveling, beacon searching, and probing.*

Temperatures were frosty but comfortable enough for our first youth classes in mid-January. Meg trained FOFAC Communications Manager Clare Menzel to teach these courses, so they were able to share the schedule load through the nine weeks of this program. This gave Meg space for rest and other work like developing our curriculum, and it gave Clare a reason to ditch her computer for a snowpit. Together, they taught 24 classes for Flathead Valley elementary and middle-school youth. Only six groups saw sunshine at the summit of WMR, but the kids were always good sports, and so excited for the hands-on learning. Thank you to Backcountry Access for providing us with new snow study kits, shovels, probes, and backpacks. As always, these classes are free for students, thanks to our sponsors. Meg also gave a classroom presentation to Glacier High School students in February.

We began motorized courses in mid-January with an Intro to Avalanches. While other organizations exist to meet the needs of human-powered recreationists (like the Whitefish Patrol Fund and the Mountain Guides), we realized that motorized users were being left behind, so in recent winters, we have refocused our education program on expanding motorized offerings, as well as the quality of our instruction. This year we offered one Partner Rescue Clinic, two Introduction to Avalanches, and two Level 1s. After teaching the classroom portion of our Intros and level 1s virtually the past two winters, it was so nice to get back in-person at FVCC.

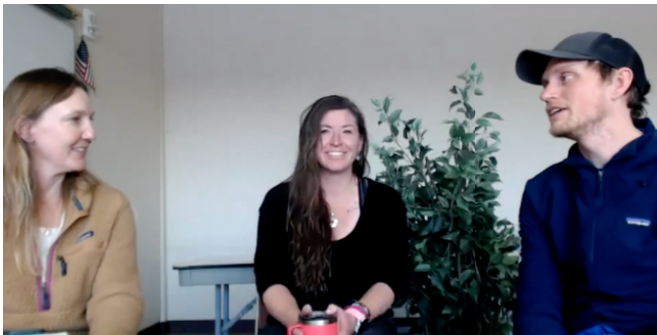
Meg led the Intros and Rescue clinic with support from Woody, and we were stoked to bring back Bozeman-based Eric Knoff for the Level 1s. Eric started Six Points Avalanche Education to provide field courses tailored to the way snowmobilers use avalanche terrain. He has 15+ years of professional avalanche experience, including forecasting for Gallatin National Forest Avalanche Center and the Going-to-the-Sun Road. He's a thoughtful, knowledgeable teacher and his specialized instruction provides significant value for our motorized students. By offering two back-to-back Motorized Level 1 courses with weekend and week-day dates, we were able to accommodate varying schedules.



*Eric Knoff instructing our Level 1*

Despite our motorized focus, we still offer our Introduction to Avalanche course to human-powered users because it's a uniquely affordable way to get into the field for a day of basic instruction. Meg led one in February with support from Cat and Paul. And though we only had that one on the schedule, we couldn't say no to the high demand, so we added another in March! We're so thankful Woody and Carmel Johnston (FNBP) pinch-hit as instructors so we could make that happen. These courses are always a great way to engage new students, and promote safe and informed decision-making as they begin to venture into backcountry travel.

In February, we launched a new four-day festival, Flathead Avalanche Friends Fest. For years, the FOFAC board has dreamed of doing a mid-season event to deepen our connection with our community when they are most engaged with our mission. In past years, we have been limited by capacity, but with more staff time and a driven Development Committee, we jumped in with gusto. We are proud to share that our first Friends Fest raised over \$7,000, engaged more than 300 people in education, and gathered many more to celebrate our culture of snow safety. The tagline "Celebrate, Learn, Support" highlights our three major priorities. From an education strategy perspective, our main goal was to engage a lot of people with brief, memorable engagements so they could learn about our products or deepen their connection to the community. The festival included beacon mini-clinics at the Glacier Institute in Columbia Falls and at Whitefish Mountain Resort for Flathead Nordic Backcountry Patrol's Hot Dog Day; keynote speaker LeeAnn Allegretto, NWS/NOAA meteorologist on weather topics including: atmospheric phenomena including arctic front events, atmospheric rivers, and La Niña; and a Big A\$\$ Raffle at Tap House Après, with Icelantic and Line skis, heli-skiing, local goods, and more.



*(L-R): Meg, Kat, and Cam. Thank you!*

In March, we brought folks together for two community workshops that were free and open all experience levels. We brought back Fireside Chats, which launched last year as an intimate, conversational forum for open dialogue about human and avalanche factors.

We held the Fireside session virtually at FVCC, with Meg, FAC forecaster Cam Johnson, and community member Kat Grebauer all sharing about near misses they experienced in February. Learn more about near misses and avalanche incidents earlier in the report.

For our last event of the season, folks packed into the upper level at Bias Brewing for our Scoop on Spring touring workshop. FAC Lead Forecaster Mark Dundas gave a great presentation that introduced the audience to weather tools and demonstrated how to plan a trip with classic spring variables in mind. With ice cream provided by Sweet Peaks, it was the perfect way to conclude a very sweet winter!

# Education Partners

Thank you for supporting our ed program!

Our educators and students are lucky to have a world-class learning environment at Whitefish Mountain Resort. In Partner Rescue Clinics, Introduction to Avalanches, youth education, and motorized classes, we educated over 1,300 students at WMR. And the beacon parks at the summit and Gray Wolf serves hundreds more! Our youth ed counterpart on the Flathead National Forest, Teresa Wenum, deserves many thanks for teaching K-4 participants in the Winter Discovery Program. Thank you to WMR for staff season passes and passes for the NRSAW raffle.

Thank you to Flathead Valley Community College (FVCC) for managing course registrations, providing insurance coverage, and hosting our classroom evening sessions. We also appreciated the venue for broadcasting our virtual Fireside Chat.

The Patrol Fund supports our safety mission in so many ways. From contributing weather and avalanche observations to speaking in our youth classes, TPF is always there to help.

For the second winter in a row, Friends of the Flathead Snowmobile Association provided scholarships for every seat in our motorized courses. This is so important for promoting avalanche education.

This winter, we partnered with Flathead Nordic Backcountry Patrol on three Hot Dog Days at WMR, where we practiced beacon searching with 500+ people. This group puts in so much work training, and we are lucky to have members help instruct our field courses.



These venue partners provided spaces to spread avalanche awareness:



# Development

## Strategic growth and investment

**35%**

Grantwriting

At the end of the winter, *tired* might be the first word we'd reach for to describe the postseason feels. But the next is *gratitude*. So much gratitude for our amazing supporters! The dollars, gear donations, and partnerships do much more than simply fund forecasting and education. They help us develop an entire community around avalanche safety. Thank you for building this with us.

**26%**

Corporate Sponsorships

Our big win this year was the significant expansion of FOFAC staff capacity. With more hours, we saw our impact grow in so many ways, as you've already seen in this report.

**22%**

Individuals

Donations from individuals nearly doubled over last year, and corporate sponsorships grew 33%, which is a huge indicator of the community's faith in our ability to make an impact with their dollars. Thank you, all!

**6%**

Strategic partnerships

**12%**

Education Programs

— *Emily Struss, FOFAC Executive Director*



L-R: (1) Clare shows off a pair of skis donated to the Big A\$\$ Raffle by Great Northern Ski & Cycle (2) Emily and Clare celebrate successful fundraising at the 2022 Great Fish Community Challenge wrap party (3) Booth goofin'

# Granting Partners

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**We couldn't do it without you**

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The Great Fish Community Challenge, operated by the Whitefish Community Foundation, is the single most important fundraising event in our season. Every fall—conveniently just before the beginning of our operating season—it connects us with our amazing user base and amplifies their impact with matching by the Foundation. Thank you to all who participate, and to the Foundation for facilitating such a meaningful and valuable community fundraising opportunity. In 2022, 162 individuals donated \$29,480, a record amount for us! The 59% match brought us to a total of \$41,000. Funds supported education in the 2022/23 season and towards the [flatheadavalanche.org](http://flatheadavalanche.org) renovation.

Weyerhaeuser joined our lineup of granting partners this season, with a \$5,000 direct donation to support our avalanche safety mission. We are grateful for companies like Weyerhaeuser putting money back into our local community and supporting safe winter recreation.

Once again, Whitefish Convention & Visitors Bureau supported Fireside Chats, our main community initiative to address the interactions between human and avalanche factors. Having the space and resources to debrief avalanche near misses is essential for a mountain community. The Fireside Chats structure allow us to do this in a public, yet safe and caring way. Reflection builds collective knowledge and a culture of snow awareness. We plan to bring Fireside Chats back again next winter for a third season.





# Thank You, Community

We get by with a little help from our friends

## \$5,000

AGL Foundation  
Stephen St Andre

## \$1,000-\$2,000

Peter Ashton  
Dow and Becky Smith-Powell  
Quinn Family Fund  
Rosso Family Foundation  
Robin Gardner

## \$500-\$750

Noah and Erin Bodman  
Jennifer Brill  
John and Katie Dickson  
Robin Gardner  
David Gordon  
Michael and Lindsey Hromadka  
Kress Family  
Grace and Christoph Menzel

## \$200-300

Bank of America Charitable Gift Fund  
Bayne Family Fund  
Big Sky IV Therapy  
Ed Blair and Kelly Ingham  
Justin Callaway  
Casey Family Donor Advised Fund  
Adam and Aubrey Clark  
Felicia Ennis  
Dan and Ann Fagre  
Andrea Goodrich and Tarek Goodrich-Penser  
Richard Gordon and Cheryl Watkins  
David Grady and Linda Engh-Grady  
Hidden Moose Lodge  
Grant and Abbey Hughes  
In Loving Memory of Jett  
Fred and Sarah Jones Donor Advised Fund  
Steven Lefever  
Sydney and Karen Perser Lillard  
Janet Mayo  
Steve Mora  
John Muhlfield and Stephanie Sunshine  
Don and Colleen Scharfe  
Joseph and Deanne Sramek  
Timothy Strand and Sukey Pfirman  
Tamarack Foundation, Inc.  
Kent and Kim Taylor  
Benjamin and Katherine Ward

## \$75-150

Ronald and Katherine Bachrach  
Big River Tile  
Karen Black  
Katie Boyd  
Seth Carbonari  
Jeff and Cheri DuBeau Carlson

Castleton Commodities International  
Jorge Cristoffanini  
Jerry and Jennifer Croskrey  
Gary and Annell Danczyk  
Alan and Frances Davis  
Talia and Luke Domenico  
Brittan and Lauren Ellingson  
Erin Eno  
Roland Frey  
Frontier Figures, LLC  
Judah and Tanya Gersh  
Glacier Guides and Montana Raft  
Sandy and Cameron Blake Gray  
Allyson Hakala  
Kira Hannah  
William Jr. Haring  
Will and Leslie Hunt  
Wink and Joy Jordan  
Sam Kavanagh  
Terry Knupp  
Kramer Family Fund  
Charlie and Linda Maetzold  
Ken and Karen McFadden  
Brian and Heidi Miller  
Zachary Miller and Grete Gansauer  
Jeff and Amy Mow  
Aidan Myhre  
Brooke Ober  
Eric and Anne Oehlerich  
Kim and Jan Richards  
Cole and Maggie Doherty Schneider  
Doc (Paul) and Terri Smiley  
Bill and Barbara Sugars  
Brad Taylor  
The 406 Realtor  
The Landlord  
Daniel White

## \$50 AND UNDER

Lauren Alley  
Zak Anderson  
Matt and Sadie Baldwin  
Mike and Ginny Baldwin  
Mike and Kristi Baldwin  
Bauman Family  
Big Mountain Family Medicine  
Chrissie Bodznick  
Rebecca Briber and Doug Griesel  
William and Margaret Burb  
Scott Carpenter  
Megan Chaisson  
Jenny Cloutier  
Michael Contrada  
Olivia Darwin  
Anna Easley  
Courtney Eberhardy

Hannah Farrell  
Jim Finneran and Martha Hunt  
Quinn Fitzpatrick  
Lynn Foster  
Peter Francisco  
Brandon and Kathryn French  
John Gangemi and Robin Bissell  
Kenny Gasch  
Bob and Joan Gates  
Jackson George  
Tim and Ali Good  
Kent Hamman  
Kira Hannah  
Tom and Sue Harding  
Kyle Haugen  
Caroline Hill  
Rod and Dori Hines  
Randy Hohf  
Charlie and Brooke Hoving  
Trevor and Kacy Howard  
Robert Jamieson  
Ben Johnson  
Gordon Johnson  
Valerie Johnson  
Tom Kalenius  
Bill and Kristin Kavanagh  
Nathan and Jenica Kelly  
Clifford and Cassidy Kipp  
Jane Kollmeyer  
Jim and Becky Lang  
Don and Sue Lewis  
Bruce and Brenda Winkler Lieffring  
Tyler Lucas  
Jerry Lundgren and Alice Ford  
acob Malkin  
Alysa Mandl and Jeff Garretson  
Jeremiah and Jennifer Martin  
Keith Meehan  
SamMirkovich  
Paul Moffatt  
Dan'l Moore  
Devonna Morgan  
Patrick Muri  
Sarah Nuckolls  
Christy O'Neil  
Jennifer Parsons  
Sheena Pate  
Carl and Kellsey Perkins  
Aaron Pitman  
Elizabeth Pitman  
Louis Schmidt  
Brian and Lyndsay Schott  
Tim and Hilary Shaw  
Emily Smith  
Will and Bonnie Smith  
Marc Sugars  
Maggie Taylor  
Thomas, Genevieve Thomas  
Sam and Julie Tickle  
Sarah McCroy Vaughan  
Becca Wheeler  
Poppy and Wyatt Wilson  
Angela Wonders  
Cynthia Woods  
Kathleen Yale

*Emily and Ted spin for the Big-A\$\$ Raffle winners during Friends Fest*

AUSTIN SEBACK



# Communications

Polishing our messaging so our mission shines

**1.8K**

Newsletter  
Subscribers

**57%**

Newsletter  
Open Rate

**7.5K**

Instagram  
Followers

**150K**

Meta reach\*

**31.7K**

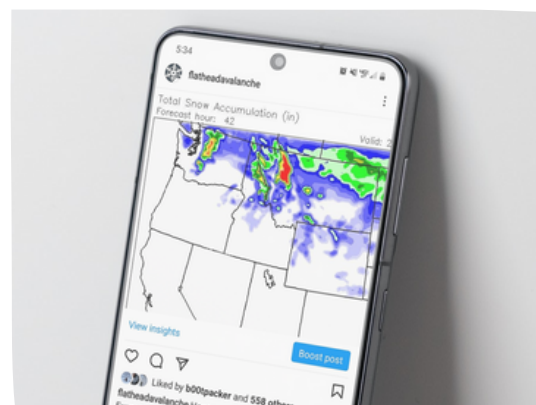
Unique visitors  
to our website\*

As always, FAC's overarching digital strategy is to steer users to our website and courses, while engaging them with timely avalanche information, short learning moments, thoughtful analysis, and travel advice.

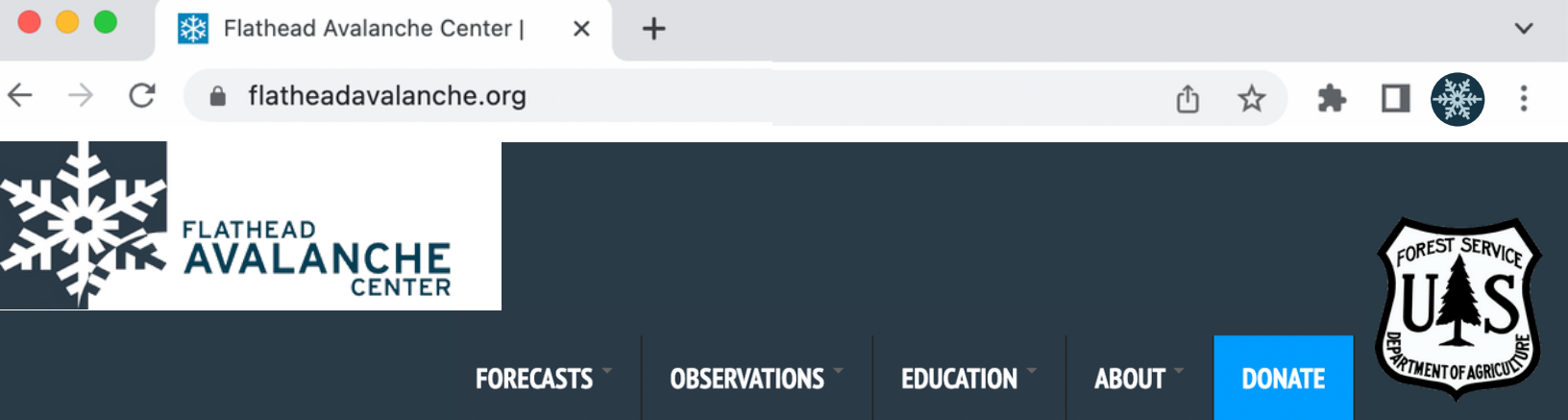
In my second winter with FOFAC, my primary goals were to a) streamline the look and feel of our brand, b) harmonize the rollout and timing of our messaging and c) complement avalanche communications with more personable, entertaining, and modern content. While our digital platforms convey important avalanche information, we believe they are also an opportunity to shape culture and build community. This year, I began exploring ways for my position to support FAC communications and I hope we will continue to grow this collaboration.

— Clare Menzel, FOFAC Comms Manager

\*10/15/22 to 4/15/23



L-R: (1) New trailhead safety signage emphasizes Know Before You Go messaging. Thanks to WCVB for the funding for this project (2) Cam publishing the advisory before the sun is up (3) Content about snow in the forecast always performs



# flatheadavalanche.org

**Our most important communications platform**

The Flathead Avalanche website is our core resource, our primary means of communicating avalanche information to the public. It hosts avalanche forecasts, observations, weather station data, the snowpack tracker, and archival records, as well as the events calendar, online store, and our donations page. Since 2012, FOFAC has owned and administered the website, including funding maintenance and development. A major renovation is underway. With a new operating platform, we hope to improve efficiency for staff and a better user experience. We use the National Avalanche Center’s Avalanche Forecasting Platform to produce forecast products and manage media. This back-end publishes the advisory products as a widget on our website. This fall, we added NAC’s new observations widget, as discussed earlier in this report. NAC widgets are well-designed and offer a standardized user experience across the United States.

Over the past decade, the number of visitors has grown significantly, from 20,000 users during winter in the 2010s to around 30,000 in the 2020s. On average, users spend two-and-a-half minutes per session and visit four pages. Our record for sessions in one day occurred during the large December 26 storm, once again demonstrating the connection between extreme weather and high traffic.

Users	Sessions	Page views	Record sessions in one day	Avg. sessions per user	Avg. pages per session
32,154	91,963	209,699	1,038	2.86	2.28

Figure 16: Website usage from October 15 to April 15

# Digital Outreach

## Investing in strategic social media content

Joint Flathead Avalanche accounts blend FAC and FOFAC content, striking a natural content balance. FAC posts conditions content in the morning window, while FOFAC posts all content related to education, merchandise, events, fundraising, and partners in the evening window. FOFAC experimented with short-form vertical content this season, in part to adapt to the changing social media landscape but also because it's a great way to showcase the mission. We were rewarded for our investment: for the first time, FOFAC content performed at pace with (and sometimes better than!) FOFAC has so much share and it was exciting to see this content tap into the full potential of our audience's engagement. FOFAC/FAC collaborations continued to be well received, from the IG weekly conditions quiz series to video products. Our IG grows by about 1,000 followers annually, a trend that continued this season. It continues to be our strongest platform, with 7,526 followers, compared to 4,638 on Facebook, 925 on Twitter, and 294 on YouTube.






Selections of Top-Performing Content		Reach	Engmt	Likes
	In this reel, two students describe a snowpit profile with made-up names for the layers.	18.3K	0.99%	132
	We hopped on a trend at the right moment with a simple, clear weekend safety message.	10.6K	4.75%	324
	A fast-paced, lighthearted reel after our first Hot Dog Day in January.	8.8K	6%	355
	Our audience always loves good photos of big slides, like this glide avalanche in February. Most likes of the season.	4.2K	10.8%	444
	What can we say, Denise is a legend! This single-photo post was our highest engagement.	3K	12.73%	368

Figure 17: A comparison of top content from October 14 to April 15. Special mention: "It's Corn!" reel (summer 2022) reached 19.5K on our page and 147K more via Outside Magazine

Jenny Cloutier connects with community at Friends Fest

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# Looking Forward

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**Celebrating 10 years of partnership. Cheers to 10 more!**

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That's a wrap! Thank you so much to the Flathead Avalanche team of forecasters, educators, and administrators for a great 2022-23 season. And, a huge thanks to our community for financially supporting our work through grants and donations. Efforts are well under way by FOFAC to raise funds for next season's avalanche safety products and services. Updates and improvements will be incorporated into a remodeled website platform for public use, weather station infrastructure upgrades, educational events, and next season's forecasting season. Take care and we hope to see you this summer.

Till next season,  
*Ted Steiner, FOFAC President*

A wide-angle photograph of a snowy mountain landscape. The foreground and middle ground are dominated by a vast, snow-covered slope dotted with numerous evergreen trees, some heavily laden with snow. The background shows a clear, bright blue sky. The overall scene is peaceful and serene, typical of a winter mountain setting.

# Friends on a powder day

[flatheadavalanche.org](http://flatheadavalanche.org)

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