Chugach National Forest
Avalanche Information Center

2012 - 2013 Annual Report

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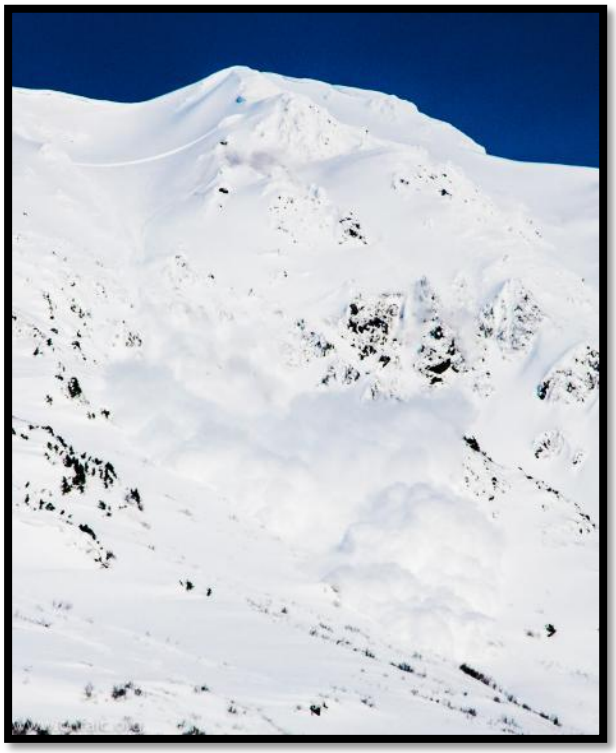
Table of Contents



Director Summary

As we finish yet another season with no avalanche fatalities in our region, I have to wonder: Are we having a significant effect on backcountry avalanche safety? It's impossible to be completely sure as luck, education, personal responsibility, and other factors will play roles in preventing recreational avalanche deaths. The only true measure will be following long term trends. That being said, skiing and snowmachine use in the Chugach continues to grow in popularity, and the lack of any fatal avalanches in the National Forest since 2010 is an encouraging sign.

We went through a historically dangerous period this year - starting on Christmas Eve and continuing through mid-January. A very shallow and weak snowpack was overloaded by 3 weeks of stormy weather. We built a maritime slab on top of a continental weak layer, making very large and destructive avalanches common across the region. This was a perfect scenario to test the effectiveness of our avalanche advisory system, but would people listen?

Human factors were significant, as skiing and riding had been poor up to that point. Motorized areas especially were few and far between as snow was hard to find anywhere north of Anchorage. As the snow stacked up with 3 feet of fresh by Christmas day we began a long stretch of avalanche warnings on our website and through the National Weather Service. The feedback was enormously positive. People seemed to be heeding the warnings and taking extra precautions.

Two close call avalanches occurred with huge potential to kill people. The first, on January 2nd, was a large full depth avalanche triggered by skiers. The group was traveling in relatively steep terrain given the known deep slab problems and potential for large avalanches to happen, but followed good protocol to expose only one person at a time. The event was not a surprise to our forecasting staff as we tracked the problems.

The second near miss was at the site of the 1999 avalanche off Seattle Ridge that killed 6 snowmachiners. Again, the deep slab problem was the culprit, causing infrequent yet very large and destructive avalanches. This one happened on January 8th as the danger began to taper off but still during a solid Considerable danger rating. Following that avalanche, skiers and riders seemed to noticeably keep their terrain choices subdued. I think a big part of the reason that behavior changed is because of the information coming through our avalanche center.

Other avalanche programs were also challenged by the early season weak layers. Alyeska spent months triggering avalanches to the ground, stripping all the snow off their steep terrain multiple times. They employed some modern public relations techniques, releasing a youtube video of their avalanche reduction efforts to educate the impatient public about the unprecedented dangers. In February the snow finally started to stick to their high angle slopes. The Seward Highway and the railroad also had challenges, with large avalanches crossing the road in multiple locations.

By early March the November weak layers were finally buried deep enough to start ignoring them, and a solid stretch of Low danger allowed much of our signature steep terrain to be safely skied.

We started the season this year with a new website design, incorporating elements developed by the standard setting avalanche centers in the lower 48. The Friends nonprofit was instrumental in making that change happen. Community fundraising continues to be essential to the operation and support of the program. For the first time, the Friends and the Forest Service entered into a legal agreement to allow community money to fund forecaster salaries. In a time of decreasing federal budgets this will give us an essential buffer to continue to provide a high quality service and augment the program from the baseline funding provided by the Forest Service. We joined the Pick-Click-Give campaign for the first time this year, receiving nearly $10,000 in donations through the Permanent Fund Dividend program. BRP/Skidoo and AMDS loaned us a 2013 Summit 800 sled for the year, allowing us unprecedented access to the far reaches of our forecast zones. All of these contributions help to keep us providing forecasts and education to the public.

The winter of 2012-2013 brought some operational stability to the avalanche center, with staffing finally reaching the correct levels to maintain our level of service. Wendy, Graham, and myself all returned from previous seasons and John Fitzgerald joined the team in Girdwood. Alex Mclain continues to observe the Seward District areas and writes the Saturday Summit advisory. Sean Fallon joined us this year for an internship, serving as an excellent field partner and creating a useful report on the common storm patterns in Turnagain Arm. Sean has amassed an impressive resume of internships with top outdoor programs including the Alaska Avalanche School and Alaska Mountaineering School.

With this level of staffing, community support, and Forest Service support I am confident that we can maintain a high level of quality and competence to continue providing the best avalanche forecasting product to the public in Alaska.

Thanks for another great season. We look forward to seeing you all next year.

-Kevin Wright
Director - CNFAIC

Acknowledgements

We would like to send a HUGE THANK YOU to the Friends of the Chugach National Forest Avalanche Information Center and our major funding partners. You are an amazing group of folks with a passion to help keep people safe in the backcountry. THANK YOU for all your support.

Additionally, we would like to thank:
-All the folks out there who submitted observations, these are invaluable!

The professional avalanche workers in the region, who work with us and share important information for the promotion of public safety.
-Alyeska Ski Patrol
-Alaska DOT
-Alaska Railroad
-Alaska Avalanche School
-Alaska Pacific University
-Chugach Powder Guides
-and many others

Industry and individual sponsorships were also instrumental in providing our forecasts and education to the community. These groups were our gold level sponsors, providing donations of money, labor, or equipment to the program.

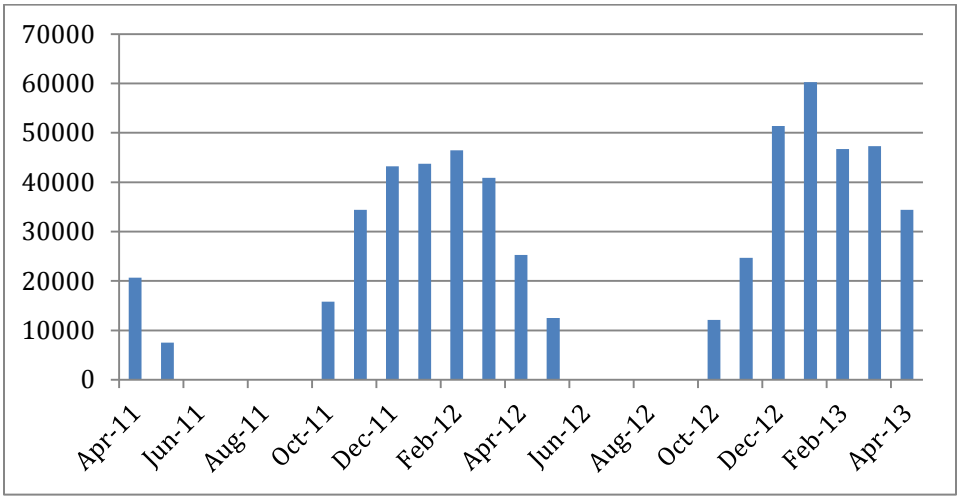
Advisories

- 182 total advisories
- 153 Turnagain
- 26 Summit
- November 17th to April 28th

We continue to have modest growth in the readership levels of the avalanche advisories. Our website is the best measure of how our message is received by the public. Website visits grew by 26,000 with 276,000 total visits between October and April this year, a 10.6 percent increase over last winter. Additionally, we set up a system to automatically email the advisory by a subscription service in the morning. Over 200 people subscribed to the email service this year.

Facebook and Twitter have been increasing outlets to pass on the advisories as well as relevant avalanche news and events. Youtube has also been a key tool to expand on the forecast by providing visuals and commentary related to the specific snowpack issues. We posted 31 youtube videos this year which were collectively viewed a total of 7249 times through the season.

- 47,500 unique visitors
- 268,000 visits (of which 200,000 were from Alaska.)
- 675,000 page views
- The most popular page is the Turnagain Advisory page.



Website Visits

Education and Outreach

Community education is the main goal of any avalanche center, and we strive to provide that link through avalanche advisories and direct interaction with the public. The CNFAIC contributed to or directly provided 30 educational opportunities to the public. These range from comprehensive instruction courses to joining vendors at open

house events. We continue to partner with the other professional educational groups in the region such as the Alaska Avalanche School and Backcountry Babes to incorporate an avalanche forecaster perspective to standard course curriculum. Youth programs including the AAS Backcountry 101 and the Chugach Children's Forest are given forecaster time for their curriculum. We are always looking for additional opportunities to work with the public.

ISSW 2012 – Anchorage Alaska

The International Snow Science Workshop was held for the first time in our local area. This conference for snow and avalanche scientists and practitioners is the largest conference of its kind in North America. Every two years it provides a venue to present the latest research for snow and avalanches in fields ranging from engineering, remote sensing, industrial safety, rescue, technology, education, and backcountry avalanche forecasting. The CNFAIC had a prominent role in hosting the conference, both the forecasting staff and the Friends nonprofit were heavily involved in the planning and implementing of the event. Over 700 professionals in the industry attended from all over the world.

The CNFAIC had a booth at the conference, Wendy Wagner presented a poster on Turnagain Pass climatology, Graham Predeger organized a panel discussion on snowmobile avalanche safety, and Kevin Wright gave a presentation on avalanche fatalities in the Alaska Range. During a field day, groups were taken out to the heart of avalanche forecasting in Alaska: Turnagain Arm and the Kenai Peninsula by bus and railroad through Chugach National Forest and given tours of the avalanche history of our region from the perspective of the highway, railroad, Alyeska resort, and the CNFAIC.

Education and Outreach

Date	Location	Outreach Type	Presenter	People Present
Sept 14-15	Anchorage	Alaska Mining and Diving Supply (AMDS) open house	Graham, Jaime Anderson	50
Sept 16-21	Anchorage	International Snow Science Workshop - oral, booth and poster presentations	Kevin, Graham, Wendy	700
Sept 21-22	Anchorage	Marita Sea and Ski Open House	Graham	30
Nov 2-4	Anchorage	Mountain Weather Course	Jim Woodmancy	14
Nov- 8	Girdwood	Fireside Chat - Avalanche awareness and Terrain Management	Kevin	30
Nov- 15	Girdwood	Fireside Chat - Snowpack and Weather	Wendy	35
Nov- 27	Anchorage	APU Outdoor Studies course lecture on avalanche forecasting	Wendy	20
Nov- 29	Girdwood	Fireside Chat - Human Factors	Wendy	15
Dec- 1	Turnagain Pass	Backcountry Babes Level 1 - CNFAIC operations and forecasting	Wendy	18
Dec- 4	Anchorage	REI - Avalanche Awareness	Wendy	47
Dec- 6	Anchorage	Fireside Chat - Avalanche Rescue	Kevin	15
Dec- 15	Seward	Avalanche Awareness	Alex, Wendy	9
Jan- 1	Girdwood	Steep Life Protocols - Dean Cummings talk at Sitzmark – CNFAIC advertising	Dean Cummings	100
Jan- 4	Girdwood	AAS Level 2, Turnagain Pass weather	Wendy	20
Jan- 8	Anchorage	REI - Avalanche Awareness	Wendy	51
Jan- 16	Anchorage	Campbell Creek Science Center avalanche science lecture	Fitz	30
Jan- 17	Turnagain Pass	APU Outdoor Studies class - Center ridge	Kevin	15
Jan- 19	Turnagain Pass	CNFAIC talk for NAOI at Turnagain Pass	Wendy	32
Jan- 20	Turnagain Pass	Observer Training Day - motorized	Graham, Fitz, Wendy	12
Feb- 8	Girdwood	AAS Youth Backcountry 101, CNFAIC operations lecture	Wendy	18
Feb- 9	Turnagain Pass	Observer Training Day - skier/snowboarder	Fitz, Wendy	8
Feb- 15	Girdwood	AAS Level 2, Turnagain Pass weather	Wendy	19
Feb- 15	Turnagain Pass	Memorial Ride/Awareness talk for 2008 double fatality	Graham, Kevin, Fitz, Wendy, Alex	35
Mar- 3	Turnagain Pass	Observer Training Day - skier/snowboarder	Kevin, Wendy	8
Mar- 5	Anchorage	REI - Art and Science of Avalanche Forecasting	Fitz	40
Mar- 8	Girdwood	Children's Forest youth education	Fitz	12
Mar- 8	Girdwood	AAS Youth Backcountry 101, CNFAIC operations lecture	Wendy	14
Mar- 31	Turnagain Pass	2nd Annual Corn Harvest - Dog demos, beacon search, etc	Graham, Kevin, Fitz, Wendy	100
Apr- 5	Anchorage	King Career Center - Forest Service talk	Kevin	18
Apr 9-13	Hoodoo Mtns	Arctic Man - Hoodoo Mtn Avalanche Assessment	Graham	20

Near Miss Avalanches

Location: Tincan

Date: Jan 3rd, 2013

Tincan Avalanche 1/2/2013

Tincan Skier Triggered Avalanche

January 2, 2013

3:30pm

This report is a compilation of information from various sources as well as forecasters' field observations on January 3rd. Visibility was very limited on January 3rd, and new snow covered much of the debris field, bed surface and crown.

HS-AS-D3-R4-O/G

Vertical fall of hard slab debris: 600'

Vertical fall of soft slab debris: 1100'

Horizontal width in starting zone: 1/4 mile

Slope Angle: 30-45 degrees in starting zones. Exact location of trigger point is unknown.

Crown depth 4-10 feet. This is an estimate from a variety of observers.

West aspect, wrapped around South to West aspects

Starting Zone elevation: 2600'

Toe of debris field elevation: 1500'

West Bowl below Tincan False, adjacent to CFR

Witnesses described the skier who triggered the slide as staying on top. It sounds like the flow was laminar and the skier was not entrained or caught up in the debris as it moved into a more turbulent flow. All other members of the party were out of the runout at the time of the avalanche.

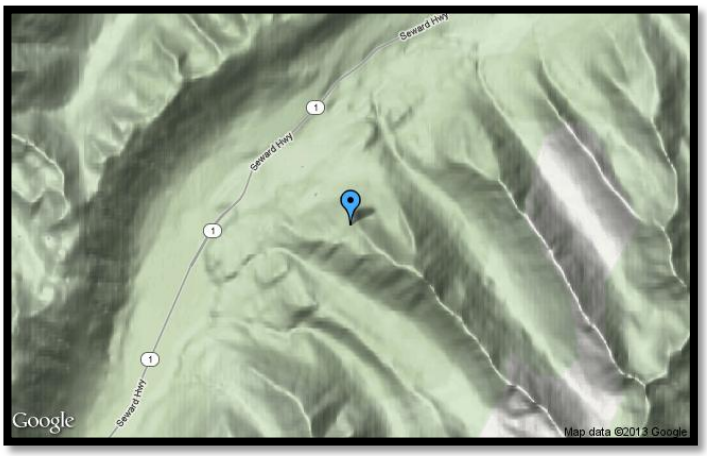
This avalanche produced sympathetic releases on adjacent slopes, most notably a slope 500 feet above the initial release, as well as several steep slopes over 800 vertical feet below the initial release. Whoompfing and "earthquake like rumbling" were felt as much as a 1/4 mile away from the slope that avalanched.

When dealing with deep slab instability, extraordinary caution is warranted when approaching avalanche terrain. Paying attention to slope angle, potential trigger points and terrain traps are critical. This avalanche occurred in a popular area on a day where the visibility had recently improved and the hazard dropped from HIGH to CONSIDERABLE. This day brought better skiing conditions than had been experienced for a long time. It sounds like the group did a good job of skiing one at a time and avoiding exposure of more than one person to the hazard.

Human factors aside, this avalanche did not just happen. It was the culmination of a season of weather that created the conditions for this to happen. October, November and December saw extended periods of clear and cold weather. This weather helped to create weak snow. Starting around Christmas a slab began building on top of this unconsolidated base. By New Years day the mountains had slabs ranging from 3-10 feet in depth. On January 2nd, a skier found the precise point that tipped the balance, producing this large avalanche.

As time goes on, it will be possible for skiers and snowmachiners to travel and play on a lot of terrain that is harboring a huge slab resting on a rotten foundation. Some slopes may hold the weight of a group and see thousands of tracks before the right trigger point is found. It is important for folks to remember what is under their feet. It (the weak base) might be 10 feet below them and they can't do a thing to affect it. If a thin spot in the slab is found, where the weak layer is closer to the person, an avalanche can release and bring with it an enormous volume of snow, as was the case in this avalanche.

Unfortunately this problem will likely linger for a long time, with alternating periods of dormancy and reactivation. Other events like this are possible for the foreseeable future.



<u>Location:</u> Seattle Ridge

<u>Date:</u> Jan 9th, 2013

Repeat Offender

Seattle Ridge Snowmachiner Triggered Avalanche 4pm January 8, 2013
HS-AMr-D4-R3.5-O/G
Start Zone Elevation: 2500'
Toe of Debris Elevation: 1,100'
Vertical Fall of debris: 1,400'
Crown Width: 1000'
Crown Height/Depth: 2-8'
Start Zone slope angles: 30-40 degrees avg
East Aspect
"Repeat Offender" aka snowmachine up-track

This avalanche was remotely triggered by a single snowmachine around the 2200' elevation. Fortunately no one was caught, buried, injured or killed in this avalanche. The hazard was rated at CONSIDERABLE above treeline on this day, following a 15 day stretch of steady snowfall. The avalanche occurred as visibility was improving towards the end of the day.

The avalanche initiated in front of and below a snowmachine as it descended from the top of Seattle Ridge. The snowpack near the trigger point was shallower than most of the avalanche crown depth. The debris overran most of the steep pitches on the standard up-track route, including the upper bench where people commonly park their sleds. The toe of debris stopped about 100 feet shy of the powerlines where crews were working to replace line and poles through the winter. On sunny days it is common to have 10 or more people in the zone that slid at any given time.

A quick pit around 2200' in snow that had not slid revealed a total snow depth of 295cm. Roughly 30cm of 2mm faceted grains are intact at the bottom of the snowpack at this site. Our ability to affect this layer in a location like this is minimal at best. The distance from the snow surface to the weak layer is close to 9 feet.

When areas of thinner slab are impacted, cracks are propagating long distances along these basal weak layers (see Tincan avalanche on January 4th for another example of this). These layers are of varying thickness and are well developed. There are still many areas holding this basic set up of very strong thick snow over very weak snow. The likelihood of triggering these full depth avalanches may steadily decline but the consequences could be grim.

This was a classic example of the deep slab problem that lingered for the first half of the winter season. Typical avalanche red flag signs were few and far between after the weak layer was more than 4 feet deep. This gave many backcountry travelers a false sense of stability when following the rules taught in basic avalanche courses. Unfortunately, when a shallow trigger point was found like it was in this example, the resulting avalanche was very large and destructive. From mid January on, full depth avalanches were not common, but the consequences of triggering one were dire.

This type of problem is a great example of why an avalanche forecast center can be so important to public safety. Basic avalanche education has a hard time explaining how and why these conditions were so dangerous. A concerted effort by forecasters to track weak layers, record avalanche events, and use public media to educate the public may have saved lives by discouraging backcountry travel during the times of peak danger.

Haines Fatality

Date: 2013-03-03
Place: Haines, Takhinsha Mountains, Kicking Horse River drainage
Fatalities: 1
Summary: 4 heliskiers caught, 2 seriously injured and 1 guide killed

While not in our zone, the fatality of a ski guide in Haines this season was the most significant avalanche event in Alaska this season. Christian Cabanilla, a guide for SEABA heliski company died from his injuries.

A heliski group of 3 skiers and 2 snowboarders were on a narrow ridge when a corniced section of the ridge collapsed, sweeping 4 down the mountain. One skier was equipped with and deployed his airbag. He survived without major injuries. Two others suffered serious injuries: 1 snowboarder suffered multiple femur fractures. One skier suffered a fractured hip, nose, and multiple facial and head lacerations. The guide, on snowboard, was killed.

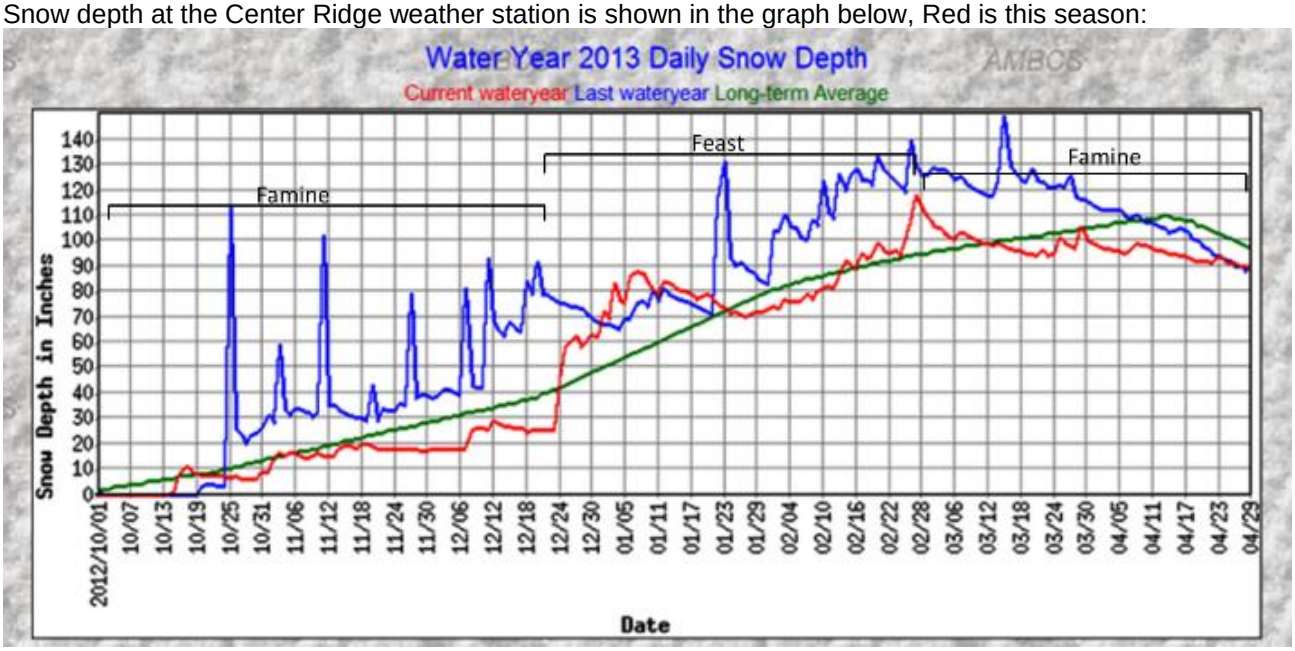
This cornice collapse did not trigger a slab, but by definition -- moving snow -- is considered a type of avalanche.

Snowpack and Weather Summary

SNOWFALL and SNOW DEPTH - (Turnagain Pass SNOTEL 1,880ft on Center Ridge)

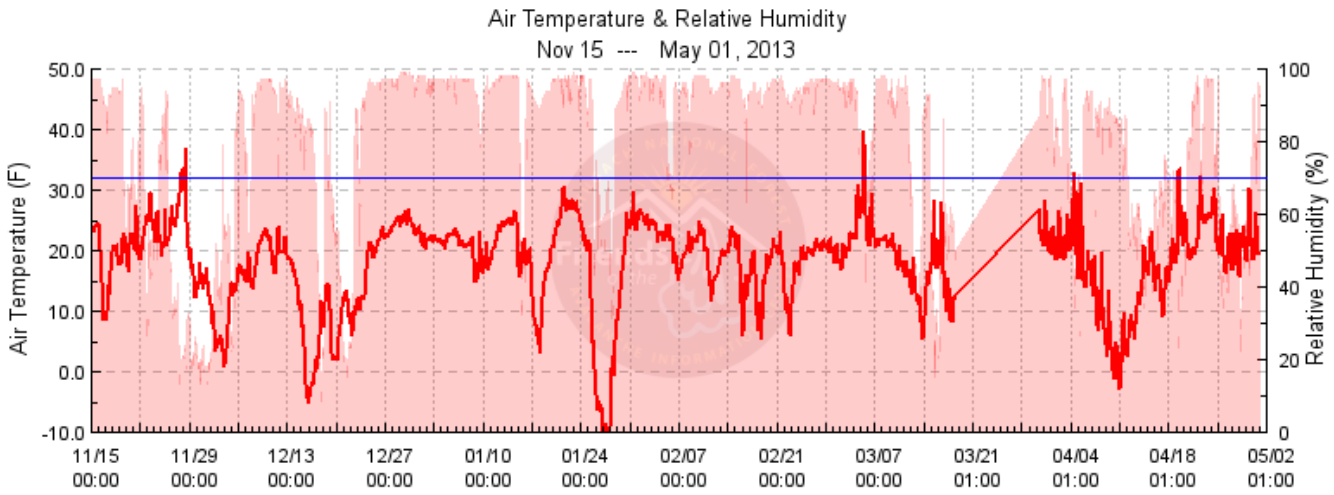
Seasonal snowfall was **322"** (Nov 1 - Apr 30) - in a feast or famine regime. Last season snowfall was 385" for comparison. In fact, of the 322" of snow that fell on Turnagain Pass, 252" (28.4" H2O) fell between Christmas Eve and February 28th. Compared to a meager 70" of snowfall (6.7" H2O) that fell during November, most of December, March and April combined. For the number geeks out there: 78% of our snow fell during only 38% of the season.

Snow depth at the Center Ridge weather station is shown in the graph below, Red is this season:

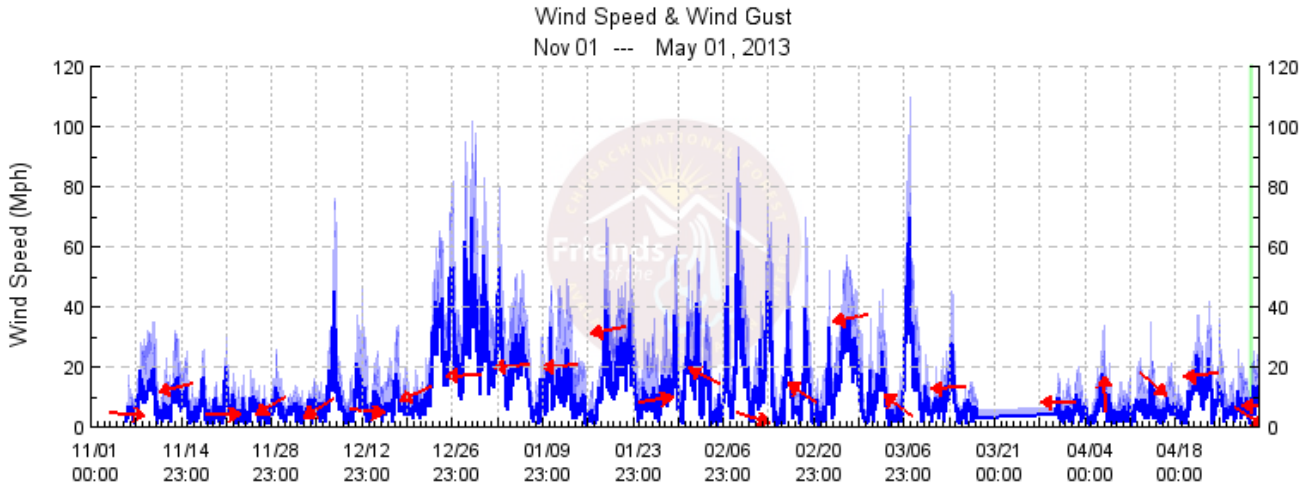


AIR TEMPERATURE - (Sunburst weather station 3,812ft)

A generally cool season all in all. The early season cold period (Nov-Dec) produced 2-3 feet of faceted snow and subsequently became quite reactive in late December and January once it was buried by the holiday onslaught. There were several large avalanches, including two close calls (**Tincan** and **Repeat Offender**). Additionally, the mid-season stormy period was interrupted by a couple days cold snap in late January. The cold snap followed 2 days of rain to 2,500' (late January crust) and is responsible for the weak snow over a crust set up that produced a handful of large avalanches during mid to late February.



WIND - (Sunburst weather station 3,812ft)
Sunburst had a much milder year for winds, compared to last season when we had record setting gusts. The mid-season stormy period is clearly evident by the increase in easterly wind from Dec 24th till the beginning of March.



October

The first snowfall for the season occurred in mid-October when 12-18 inches fell on a warm ground. Afterwards, a two week period of cold and clear weather set in and the snow quickly became quite faceted – this layer is hereafter known as the “October facets”.

November

What a dry month! November had just enough snow to actually ski, but only barely. The month was defined by extended dry stretches, only brief interludes of snowfall, and lots of facet and surface hoar formation. There wasn’t a single major storm in the entire month, with the most significant snowfall coming on November 2nd when 5 inches fell. The latter half of November was dominated by a classic blocking high pressure across Alaska, with the jet stream directing moisture south towards British Columbia and Washington. Wind for the month also stayed moderate with the lack of major storm systems.

The CNFAIC began advisories on the 17th, with a Considerable danger rating above treeline. The shallow snowpack had just enough slab above the October facets to create avalanche problems. A number of skier triggered avalanches were reported as well as some interesting naturals. As the month progressed without any new precipitation, the danger steadily dropped. The snowpack slowly but surely faceted out once again with clear and cold weather producing high temperature gradients in the shallow pack. By the end of November, it was impossible to find a layer that didn’t have faceted forms dominating – hence we now have a layer of “November facets” on top of the October facets. Surface hoar also built to impressive size at the valley floors, and in some cases all the way to ridgetops.

We end the month with decent skiing in the few places we can access (Sunburst, Tincan, Seattle Ridge, Eddies...) on shallow faceted powder. The lack of any real strength in the snowpack does not bode well for backcountry stability when the next storm system finally hits...

H20 - 2.3 inches
Snow - 22 inches

Full depth slab avalanche – Seattle creek 11-21-12

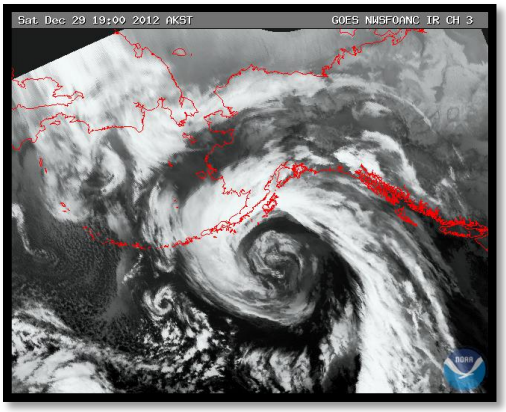
December

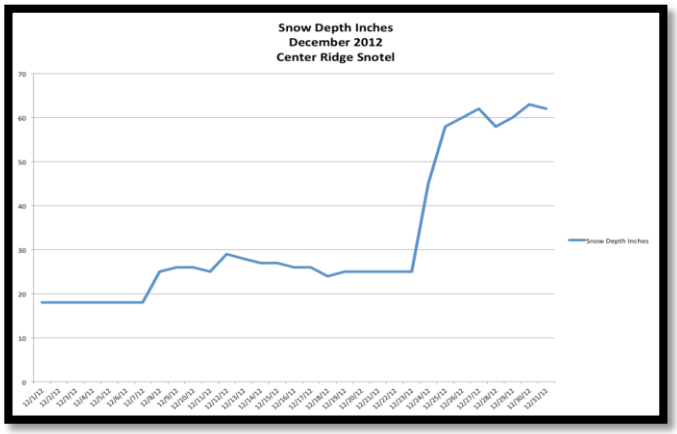
The first storm to land on our faceted pack occurred on the 8th and 9th. 10+ inches of snow in the first storm was a mild disappointment. Not enough to really shock the snowpack, but enough to leave tender slabs above treeline. We had a very active day on the 9th on Tincan, triggering small rolls, and the potential for bigger terrain to produce bigger avalanches was high. However, volumes were still low considering the slabs were only around a foot deep. The next 10 days were dry and cold - again. We dropped the danger rating down to Moderate, but continued to find poor strength and propagation potential in some areas.

On Christmas Eve the weather finally changed in earnest. Late on the 24th, snowfall began and kept steady into January. A series of powerful storms spinning off a Bering Sea Low pressure complex hit our region with force. Between the 24th and the 31st, 8.9 inches of water was recorded at the Turnagain SNOTEL, with even more at Alyeska and higher elevations. Temperatures stayed cold enough for snow above 1000 feet. The avalanche cycle was predictably impressive, we now had a deep slab problem on our hands with 3-6' of storm snow over 2' of October and November facets. Avalanches were failing just under the storm snow in the top of the November facets, pulling out slabs of impressive size. In general, avalanches weren't running far because of the exposed trees and rough runouts. The vast majority of avalanches we saw and recorded were natural or explosive triggered. The weather was just too bad for most people to spend time in the backcountry.

The combination of such an advanced weak layer and excessive snowfall brought our danger rating to Considerable or High above treeline for 23 consecutive days starting on December 24th. In hindsight, I believe our caution was accurate and warranted.

Eddies – 12-28-12





H20 - 10 inches
Snow - 89 inches

January

The New Year continued on with heavy snowfall and extended series of storms. We finally got a short break on January 10th/11th. This allowed us to get a closer look at many impressive avalanches. On the 2nd a large deep slab was triggered by a skier on lower Tincan ridge. The avalanche took out a quarter mile section of the mountain in a very high use area with sections of crown face up to 10 feet deep. Comments such as it felt “like an earthquake” were reported and it was able to sympathetically trigger other smaller deep slabs in the area. A couple days later, we had large full depth avalanches at Whittier tunnel (portage side) and east Seattle ridge. On the 8th a snowmachine remotely triggered most of Repeat Offender near the Seattle ridge up-track. This slide was estimated at 1000 feet wide and obliterated a large swath where snowmachiners frequently ride. It was extremely lucky that nobody was killed. Following so many dramatic avalanche events our message seemed to be getting to the users and even when the weather cleared, backcountry travel was relatively subdued.

After a short break in the weather a warm southwest flow hit us on the 12th, which gave us another day of big avalanches on the 13th. Slides were hitting the road at Girdwood flats and large deep slab avalanches in areas like Lynx creek and Mount Alpenglow. The rest of the month brought slowly increasing stability and relatively light snowfall. On the 21-23rd a warm system moved through and rain fell to 3000 feet followed by cooler temperatures and light snow. This created a series of crust/facet sandwiches that became reactive later on in February. The lurking October and November facets never fully convinced us that they were unreactive through the end of January, although no more full depth avalanches were observed.

H20 - 9.4 inches
Snow - 74 inches

February

February defined itself as a gray month. Measurable snowfall was recorded 22 out of 28 days, but these were modest snowfalls in the 2-8" range. Many days with a little bit of snow eventually add up to a lot... Avalanche danger hovered in the moderate to considerable range. Persistent weak layers formed around the January crust continued to be a concern, although few avalanches were observed. Chugach Powder Guides observed some avalanche activity that slid on that crust in the Winner Creek region. The unstable layer affected the terrain they were able to safely ski.

On the 15th AKRR shot down a D4 avalanche at the Kern slide path that covered the tracks and the highway and sent a cloud into Turnagain Arm. This was believed to be failing above the January crust.
On the 18th a group of snowmachiners triggered a large avalanche above Carter lake that took the entire snowpack to the ground. This was the first full depth avalanche failing in the October/November weak layers that we had seen since mid-January. Snowmachines were damaged but no injuries were reported.

The biggest storm occurred during the last week of the month. While the intensity was building slowly, and before forecasters had their guard up, a large natural avalanche crossed the Portage highway at the 5 Sisters path. This was estimated as a 5-10 year frequency event and closed both lanes with debris 5 feet deep. Other mitigation work by AKRR and DOT showed mostly small results. We believe the 5 Sisters avalanche was related to the January crust.

Alyeska North Face – Heather Thamm Photo

H20 - 9.3 inches
Snow - 92 inches

March

March was relatively uneventful as we entered one of the peak months for Alaska winter recreation. Some of the larger avalanche activity was related to large cornice failures - fortunately natural with no human involvement. Precipitation was light, keeping new snow avalanche problems to a minimum. Only a couple spikes to Considerable interrupted the mostly Low and Moderate danger ratings for the month.

Relatively stable conditions allowed people to explore far and wide. One of the larger slab avalanches happened near the Portage glacier due to unknown snowpack conditions. As people expand their areas of travel it's worth noting that our forecasting ability is limited in the terrain closer to Portage, Whittier and Prince William Sound due to much different meteorological conditions.

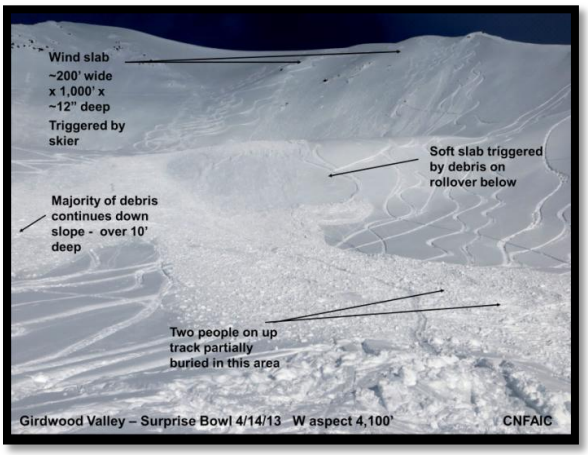
Mid-month saw many days of Low avalanche danger with sunny weather. The most precipitation came at the end of March as two storm systems brought moderate snowfall to the region. Small wind slab avalanches were prevalent with, but nothing too significant for backcountry travelers. Sun crusts on southern aspects caused some predictable weak interface problems by the end of the month, but with only small amounts of new snow the problems remained manageable.

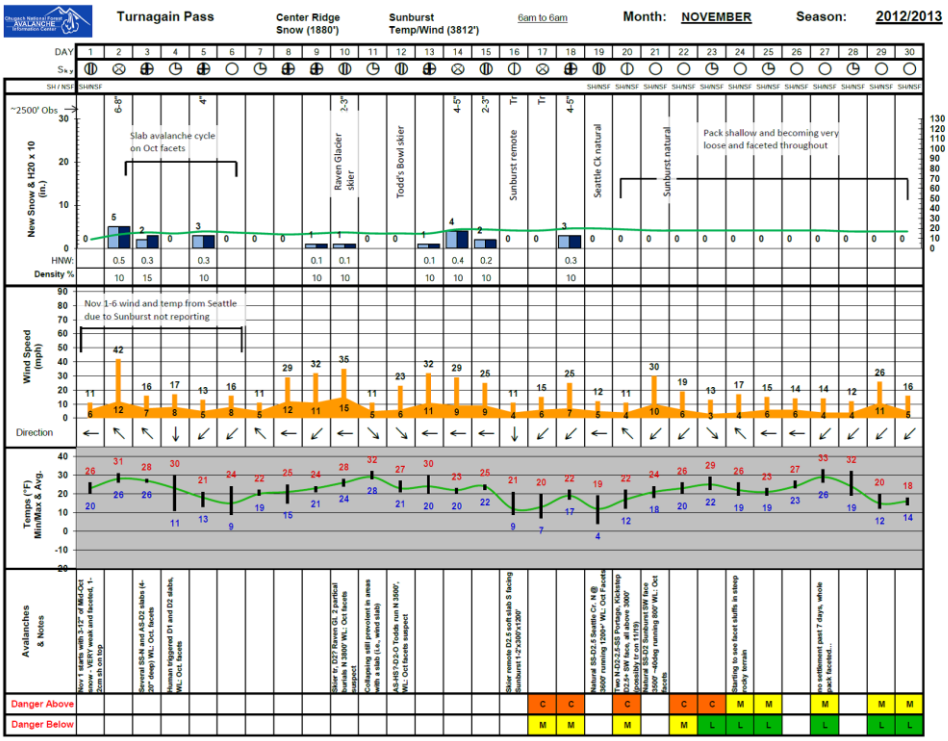
H20 - 3.1 inches
Snow - 34 inches

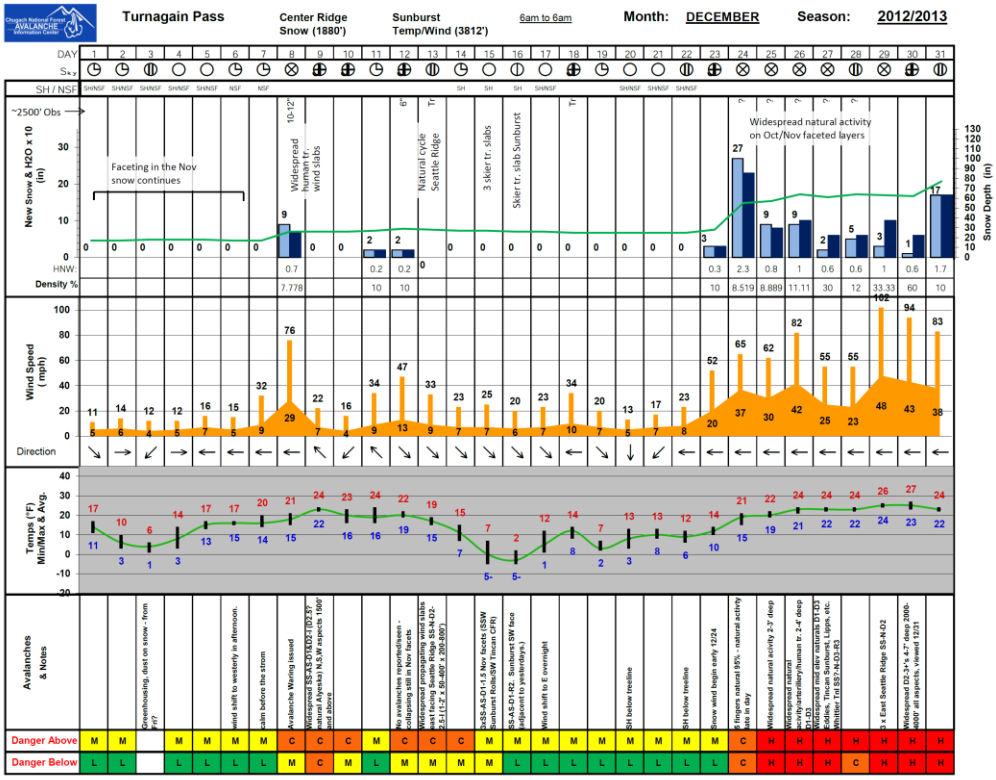
April

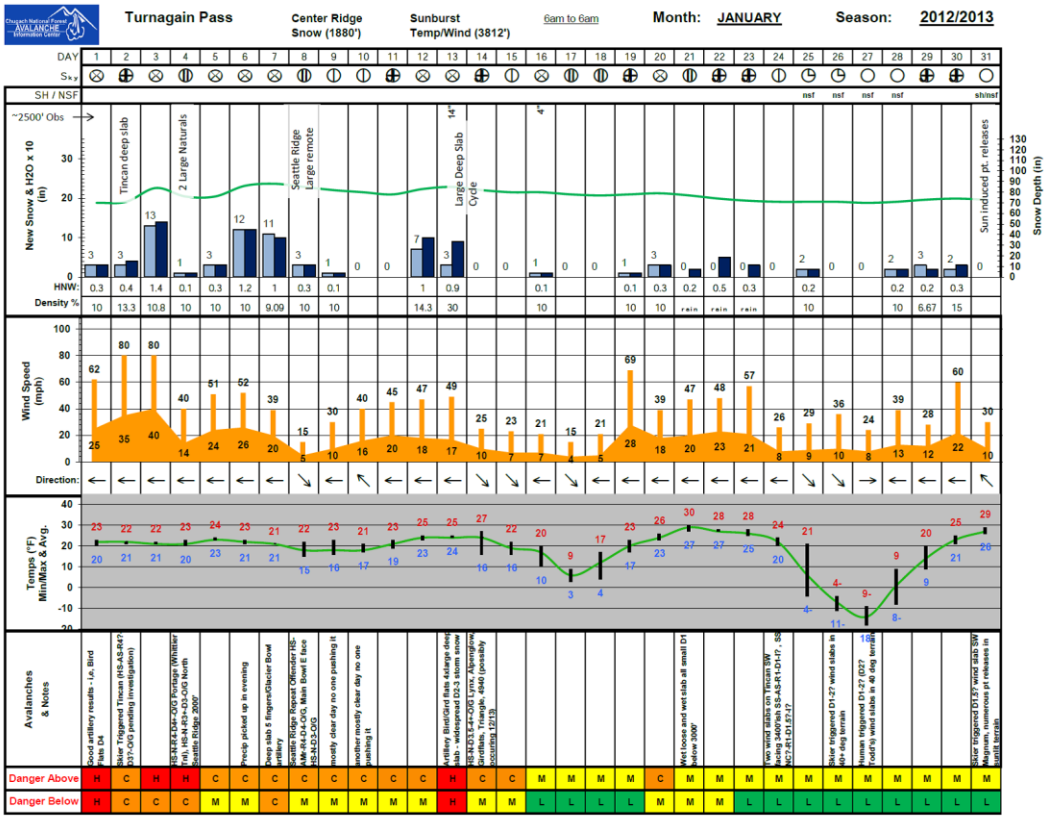
April continued the trend set by March, with generally benign and sunny weather and many people enjoying the return of the light. Avalanche activity was mainly confined to new snow/wind slab instabilities and sun induced wet loose and shallow slabs on south aspects. April 6-9th saw 12-18 inches of snow failing on crusts and near surface facets. As you can imagine, several storm slab and wind slabs were kicked off and these persisted for a week. One near miss was reported in Surprise Bowl near Girdwood where a skier triggered an aging wind slab. The skier rode 200' until self-arresting with debris crashing down over 1,000' and partially burying two people ascending from below. The slow to heal 6-9th storm snow over variable weaknesses kept the danger rating above treeline at Moderate.

Not only did April turn out to be dry, but abnormally cold as well. Temperatures stayed well below freezing at night, dampening the effects of intense sunlight and warming during the day. This kept melting to a minimum until the last week of the month which extended the travel season in low elevation terrain such as Placer and 20 mile. Usually by the end of April the shed cycle or melt down is well on its way, but not this year. We will have to see what May brings and maybe we will escape the shed after all…



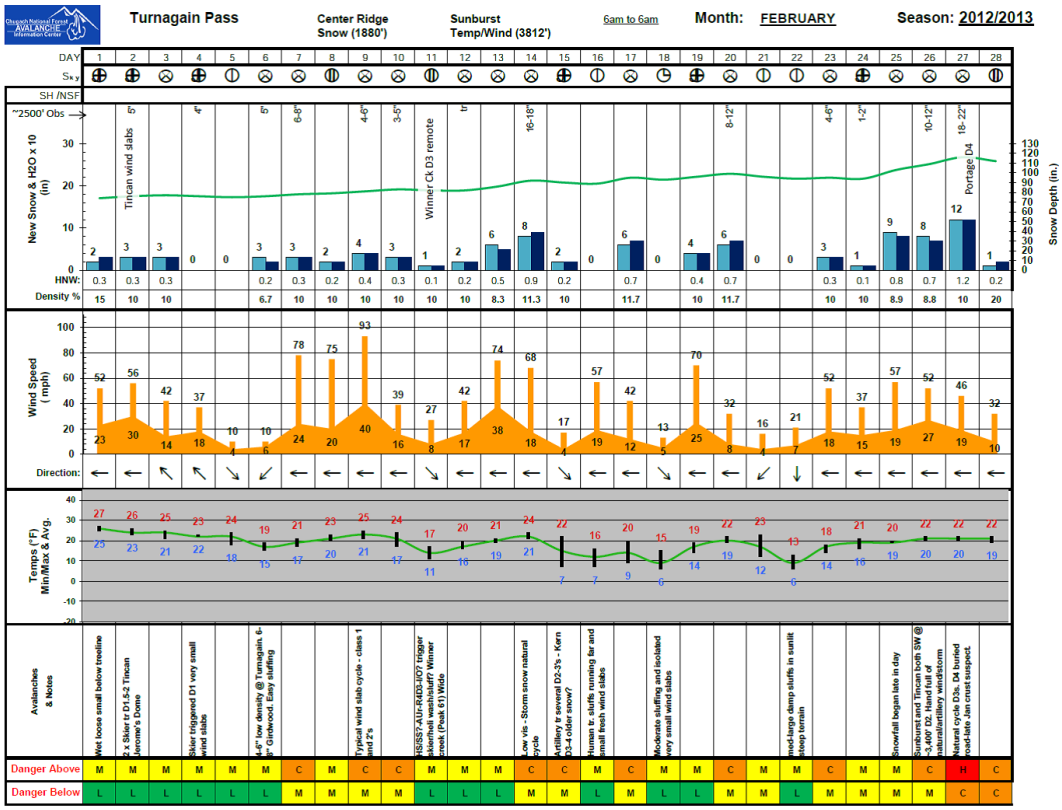

Turnagain Pass
Center Ridge Snow (1880')
Sunburst Temp/Wind (3812')
6am to 6am
Month: NOVEMBER
Season: 2012/2013
DAY
Sky
SH / NSF
~2500' Obs
New Snow & H20 x 10 (in.)
Slab avalanche cycle on Oct facets
Raven Glacier skier
Todd's Bowl skier
Sunburst remote
Seattle Ck natural
Sunburst natural
Pack shallow and becoming very loose and faceted throughout
HNW:
Density %
Snow Depth (in.)
Wind Speed (mph)
Nov 1-6 wind and temp from Seattle due to Sunburst not reporting
Direction
Temps (°F) Min/Max & Avg.
Avalanches & Notes
Danger Above
Danger Below
MONTHLY SNOW: 22.0
MONTHLY H20: 2.3
SEASONAL SNOW: 22.0
SEASON H2O: 2.3
*Key for precipitation graph: Light blue bars = Height of New Snow. Dark blue bars = Height of New Water X 10. (For example, when bars are of equal height, snow density is 10%.)


Turnagain Pass
Center Ridge Snow (1880')
Sunburst Temp/Wind (3812')
6am to 6am
Month: DECEMBER
Season: 2012/2013
DAY
Sky
SH / NSF
~2500' Obs
New Snow & H2O x 10 (in)
Faceting in the Nov snow continues
Widespread human tr. wind slabs
Natural cycle Seattle Ridge
3 skier tr. slabs
Skier tr. slab Sunburst
Widespread natural activity on Oct/Nov faceted layers
HNW:
Density %
Snow Depth (in)
Wind Speed (mph)
Direction
Temps (°F) Min/Max & Avg.
Avalanches & Notes
Danger Above
Danger Below
MONTHLY SNOW: 89.0
MONTHLY H20: 10
SEASONAL SNOW: 111.0
SEASON H2O: 12.3
*Key for precipitation graph: Light blue bars = Height of New Snow. Dark blue bars = Height of New Water X 10. (For example, when bars are of equal height, snow density is 10%.)



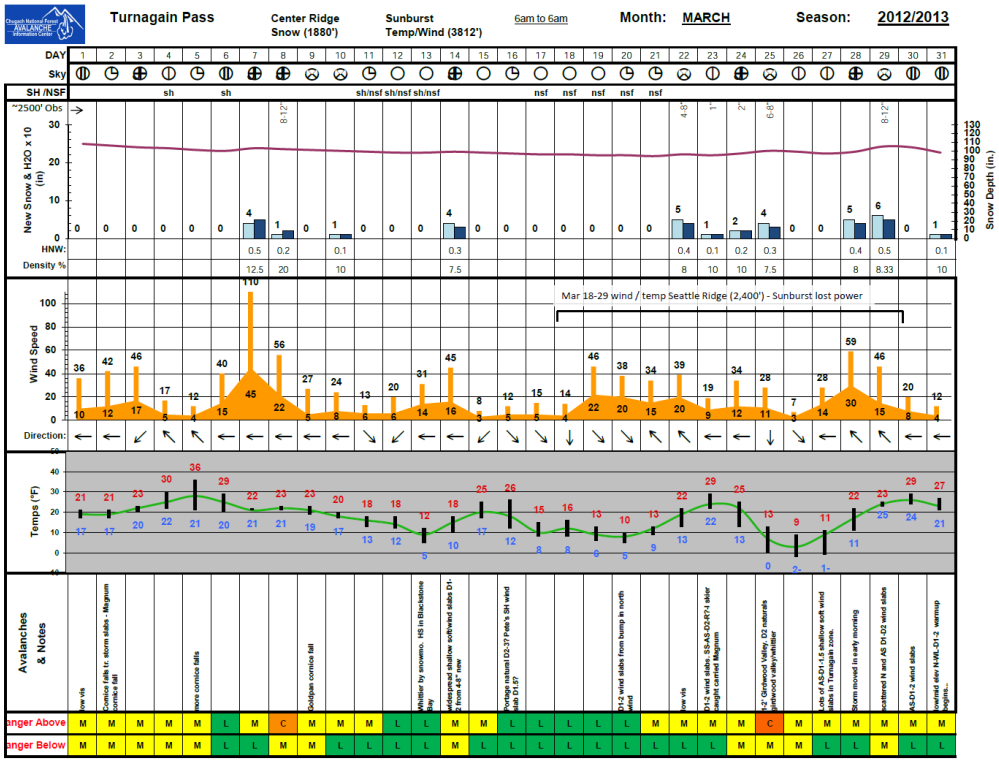
MONTHLY SNOW: 74.0 MONTHLY H2O: 9.4 SEASONAL SNOW: 185.0 SEASON H2O: 21.7

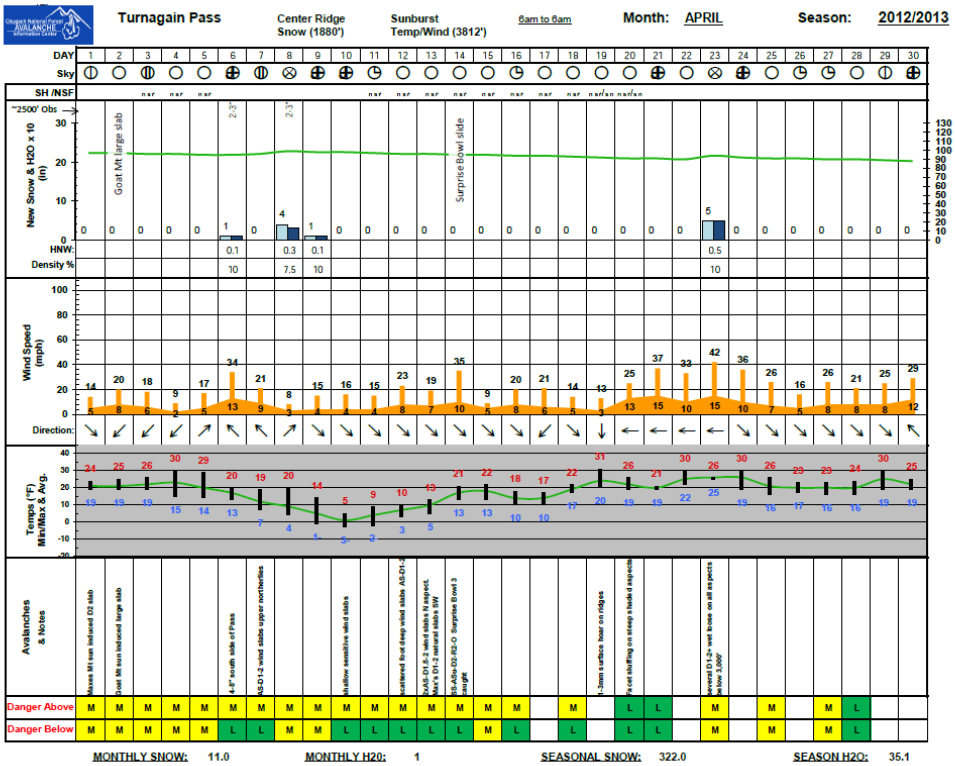
*Key for precipitation graph: Light blue bars = Height of New Snow. Dark blue bars = Height of New Water X 10. (For example, when bars are of equal height, snow density is 10%.)



MONTHLY SNOW: 92.0 MONTHLY H2O: 9.3 SEASONAL SNOW: 277.0 SEASON H2O: 31

*Key for precipitation graph: Light blue bars = Height of New Snow. Dark blue bars = Height of New Water X 10. (For example, when bars are of equal height, snow density is 10%.)


Turnagain Pass
Center Ridge Snow (1880')
Sunburst Temp/Wind (3812')
6am to 6am
Month: MARCH
Season: 2012/2013
DAY
Sky
SH /NSF
~2500' Obs
New Snow & H2O x 10 (in)
Snow Depth (in.)
HNW:
Density %
Wind Speed
Mar 18-29 wind / temp Seattle Ridge (2,400') - Sunburst lost power
Direction:
Temps (°F)
Avalanches & Notes
Danger Above
Danger Below
MONTHLY SNOW: 34.0
MONTHLY H20: 3.1
SEASONAL SNOW: 311.0
SEASON H2O: 34.1
*Key for precipitation graph: Light blue bars = Height of New Snow. Dark blue bars = Height of New Water X 10. (For example, when bars are equal height, snow density is 10%.)


Turnagain Pass
Center Ridge Snow (1880')
Sunburst Temp/Wind (3812')
6am to 6am
Month: APRIL
Season: 2012/2013
DAY
Sky
SH /NSF
~2500' Obs
New Snow & H2O x 10 (in)
Goat Mt large slab
Surprise Bowl slide
HNW:
Density %
Wind Speed (mph)
Direction:
Temps (°F) Min/Max & Avg.
Avalanches & Notes
Danger Above
Danger Below
MONTHLY SNOW: 11.0
MONTHLY H20: 1
SEASONAL SNOW: 322.0
SEASON H2O: 35.1
*Key for precipitation graph: Light blue bars = Height of New Snow. Dark blue bars = Height of New Water X 10. (For example, when bars are equal height, snow density is 10%.)

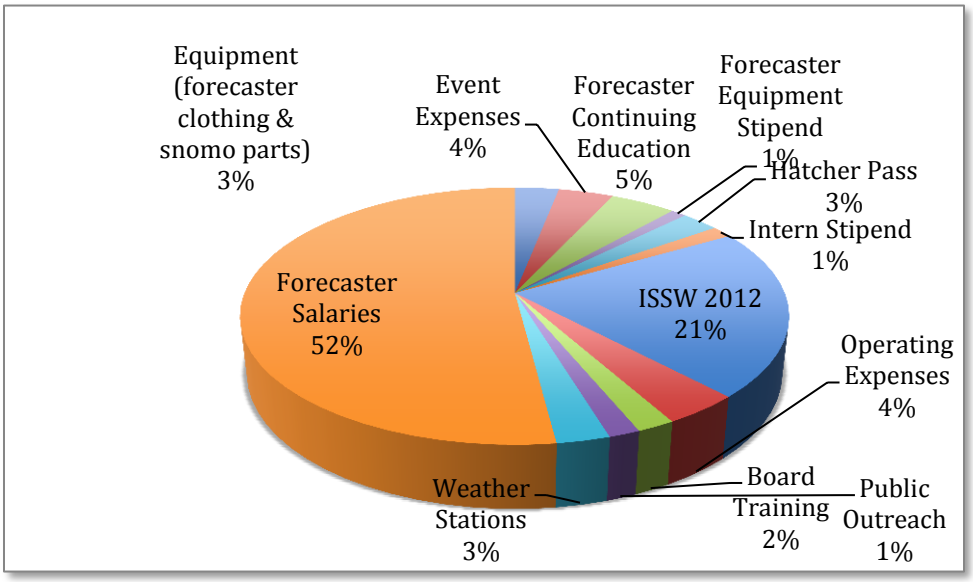
Friends of the CNFAIC

The Friends of the Chugach National Forest Avalanche Information Center is a 501(c)(3) organization. They provide funding for the operations of the CNFAIC. The Friends celebrated a 10 year anniversary this year, and the resignation of Skip Repetto, whom has held the President position on the board since the beginning of the organization. The Board of Directors include: Sarah Heck (interim President), Gretchen Roffler (Vice President), Tim Glassett (Secretary), Bryn Clark (Treasurer), Jaime Andersen, Billy Finley, Aria Thomases, Rick Meredith and Liz Repetto.

Where the money got spent:

Equipment (forecaster clothing & snomo parts)	$1,447.73
Event Expenses	$1,806.79
Forecaster Continuing Education	$2,169.90
Forecaster Equipment Stipend	$500.00
Hatcher Pass Avalanche Center	$1,240.00
Intern Stipend	$690.00
ISSW 2012	$10,000.00
Operating Expenses	$1,837.28
Board Training	$900.00
Public Outreach	$740.95
Weather Stations	$1,256.25
Forecaster Salaries	$24,494.40

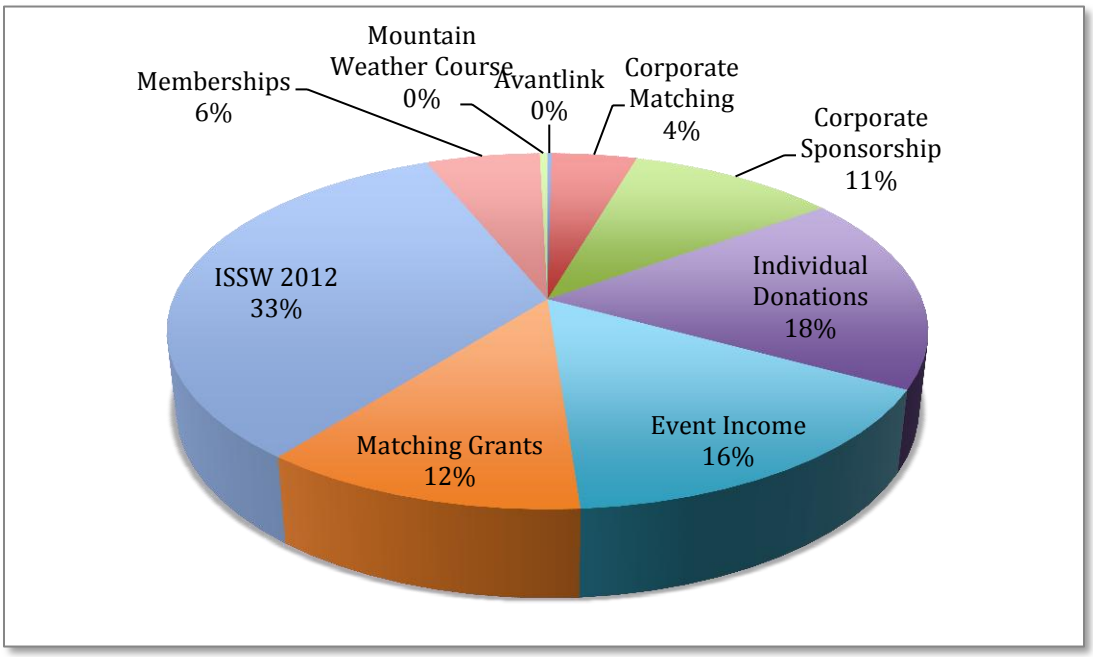
F-CNFAIC 2012/2013 Season Expenses to Date (percent of total)



Where the money came from:

Avantlink	$161.00
Corporate Matching	$3,300.00
Corporate Sponsorship	$8,080.00
Individual Donations	$13,750.36
Event Income	$12,160.00
Matching Grants	$9,000.00
ISSW 2012	$25,500.00
Memberships	$4,420.00
Mountain Weather Course	$300.00

F-CNFAIC 2012/2013 Season Income to Date
(percent of total)



This year was an anomaly in that ISSW was an expense, but also brought income that will not be seen in future years. Our sponsorship donation was down, but our member/individual donations were up. Weather stations seemed to be a low expense this season. There was the addition of the Penguin Ridge weather station that was purchased with last year's budget, but went on-line this season. A2D Sledworks graciously offered free labor on the snowmachines, and BRP donated a snowmachine for the forecasters to use for the season, both of which were huge assets to the Forcasters. The Friends work hard at keeping overhead expenses low, so that most income can go to work for the CNFAIC.

The Friends also signed a Collection Agreement with the Forest Service, showing a partnership that will last for many years to come.

AWARDS

The CNFAIC program is a community asset, held in high regard by the backcountry public and considered the Regional Center of Excellence in Alaska by the National Avalanche Center. This year Director Kevin Wright was nominated by the Friends and received recognition as a Top 40 under 40 in Alaska. This award recognizes young community leaders in the public and private sectors.

The Chugach avalanche team also received an honorable mention Regional Forest Award for their proactive and creative response to the needs of customers; their significant contribution and volunteerism in special events; their adaptive use of technology; and their consistent and professional performance in caring for the land and serving people in South-central Alaska. Team members: Meteorological Technicians Kevin Wright, Wendy Wagner, and Chris Engelhardt; Public Service Officer David Ilse; Natural Resource Specialist Graham Predeger, and Forestry Technician Alex McLain.

New Technology

As smartphone technology gains ground in how people access the internet, we constantly have to adapt to changing habits of the public. This year we partnered with the Avalanche Forecasts smartphone app to provide another way to quickly and easily access the CNFAIC advisory. This project also spurred us to finally delineate the geographic region that our avalanche center covers. After careful consideration and consultation we came up with these two zones for the Turnagain Arm advisory and the Summit advisory. This was based on similarities in weather and snowpack, the areas where we get the most backcountry use, geographic coverage of remote weather stations, and the areas where forecasters are able to evaluate actual conditions on the ground with reasonable frequency. The maps will soon be a feature on the home page of our website and provide a direct link to the written advisory.

This mapping project is also a greater national effort to map the forecast zones of all avalanche centers working under the National Avalanche Center. The project will eventually be accessible on www.avalanche.org with an interactive google map interface. Other avalanche centers including the Gallatin Avalanche Center have already incorporated this map into their website interfaces.

Partnership with BeadedStream
Turnagain Pass Snow Temperature Array

The CNFAIC was very excited to partner with BeadedStream LLC out of Anchorage this season. BeadedStream specializes in monitoring temperature in cold environments. A string of temperature sensors 3 meters long with sensors every 10cm was installed on Center Ridge near the Turnagain Pass SNOTEL site. This set of instruments monitored soil, snowpack and air temperature along with snow depth throughout the season. Real-time data was displayed on a link from the CNFAIC website (check it out under the weather tab at www.cnfaic.org). Information gathered and used by forecasters included, but is in no way limited to, near surface temperature gradients in both the snow and air as well as mid pack and deep pack evolution. Additionally, being able to observe the snowpack's springtime transition to isothermal in anticipation of the shed cycle is extremely valuable.

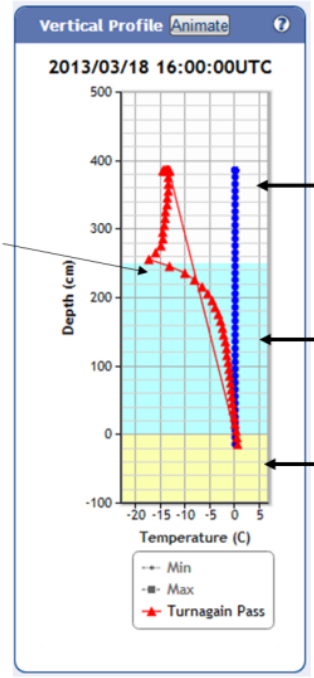
BeadedStream staff Zach Seligman and Brain Shumaker head up with Wendy to install temperature array (2,000' elevation).

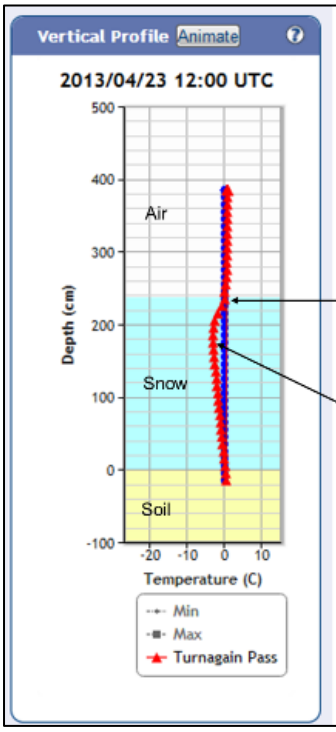
Below are two examples of how we used the temperature profile to describe different snow conditions.
*Data can be found on our website: www.cnfaic.org under the weather tab

Large change in temperature in the top 50 cm (20 inches) of the snowpack. As much as 40C per meter.

Red line shows temperature of the ground all the way through the snowpack and into the air every 10cm.

Blue line shows the 0C mark for reference.





Turnagain Pass (2,000')
April 23rd at 4AM

Red line - snow temperature

Blue line – 0C (32F) for reference

Top 10cm warm (no refreeze)

Mid-pack is between -1 and -4C.

Pack still contains cold snow

Volunteer Help

In addition to our core Forest Service staff and the dedicated group of Board Members with the Friends nonprofit group, we also get help from members of the community. These volunteers fill in the gaps when something needs to get done but we don't have the staff to get it done on our own. Much of the time is used as field partners for forecasters, dramatically decreasing costs to the program by reducing the number of employees who are needed to collect field data. At least 21 people donated a combined 816 hours to the avalanche center. This does not include the time devoted to fundraising and other efforts of the Friends Group.

Thanks for Another Safe and Successful Year!

L to R: Graham, Wendy, Alex, Fitz, and Kevin