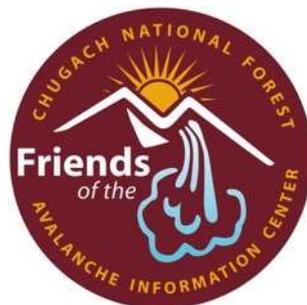


Chugach National Forest Avalanche Information Center



2013 - 2014 Annual Report



Chugach National Forest Avalanche Information Center
P.O. Box 129
Girdwood, AK 99587
Phone: (907) 783-3242

Photo: Seattle ridge avalanche – Mike Davis

Table of Contents

Director Summary

Acknowledgements

Advisories

Education

Near Miss Avalanches

Snowpack and Weather Summary

Fundraising - The Friends of the CNFAIC



Director Summary

According to Wendy, this was the winter that “almost was”. Every time the weather started to line up, something went wrong and the copious snow that we’ve grown accustomed to didn’t materialize. The year ended with snowfall and precipitation below average, and backcountry quality also below average. Snow water equivalent was only 53% of average by the end of April. Most people will remember the year for the crazy weather (and avalanche cycle) that we saw in January.

The first month of 2014 was punctuated with unseasonably warm temperatures. For 3 weeks from mid-January to early February, temperatures reached above freezing. High temperatures came in with a lot of rain water, overloading the snowpack and triggering numerous deep avalanches. The avalanche cycle was something more likely seen in April than January. Fortunately the backcountry public stayed fairly safe – conditions were not inspiring to get into the mountains. This storm put Alaska in the national spotlight with the Valdez “dam-avalanche” shutting down the Richardson highway for more than a week.

If I had to point out a trend from this season, it would have to be the large number of remotely triggered avalanches. Nearly all of the major human triggered avalanches that were reported to us were remotes, sometimes triggering large areas in multiple pockets. This trend underscores the tenuous nature of our shallow snowpack with frequent persistent weak layers.

We’ve been lucky in the last 4 years. Not a single person has died from an avalanche in Chugach National Forest during that time. This is the longest stretch without an avalanche death since 1996. I’d like to hope that part of this is due to better information and the efforts of the CNFAIC, but we know that pure luck plays a huge role as well. I don’t think this 4 year stretch has true statistical significance, and only time will tell if we can

maintain safer backcountry habits in the general population as backcountry use continues to grow.

The CNFAIC now has more support and resources, and reaches more people than ever before. The Friends of the CNFAIC has proven to be a powerful support group for fundraising and building community support. With federal government sequestration the Forest Service has taken mandatory budget cuts. Fortunately the nonprofit has stepped up to offset that decline in funding. Grants and industry partnerships have enabled us to replace a rusting out snowmachine trailer and given us modern snowmachines for field work. This gives us the tools to connect to the motorized community, which now represents the largest demographic of recent avalanche fatalities.

The other part of community involvement that really helps our cause is direct observations. Our website has become a depository of crowd-sourced information. Photos, videos, and written observations from the public continue to grow in volume. This gives us the clearest picture of snow stability in the mountains that we've ever had.

Thanks for another great season. Here's to a safe summer and ample snow for next winter!

-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

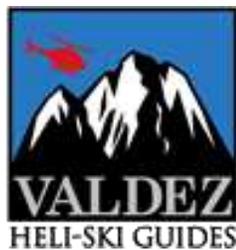
-and many others

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

Gold Level Sponsors



THE
JOHN
BYRNE
FAMILY



Voile

Advisories

172 total

150 Turnagain pass region

22 Summit Lake

November 21st to April 27th

Total website use dropped this year, for the first time in the history of the program. The complete story is a little more complicated... The total number of people (users) accessing our advisories actually **increased by 15%**. The drop in website hits is most likely because of such a dismal snow year in our region. Through the email subscription option, an additional **366** people receive the advisory in their inbox each morning.

Numbers from November through April:

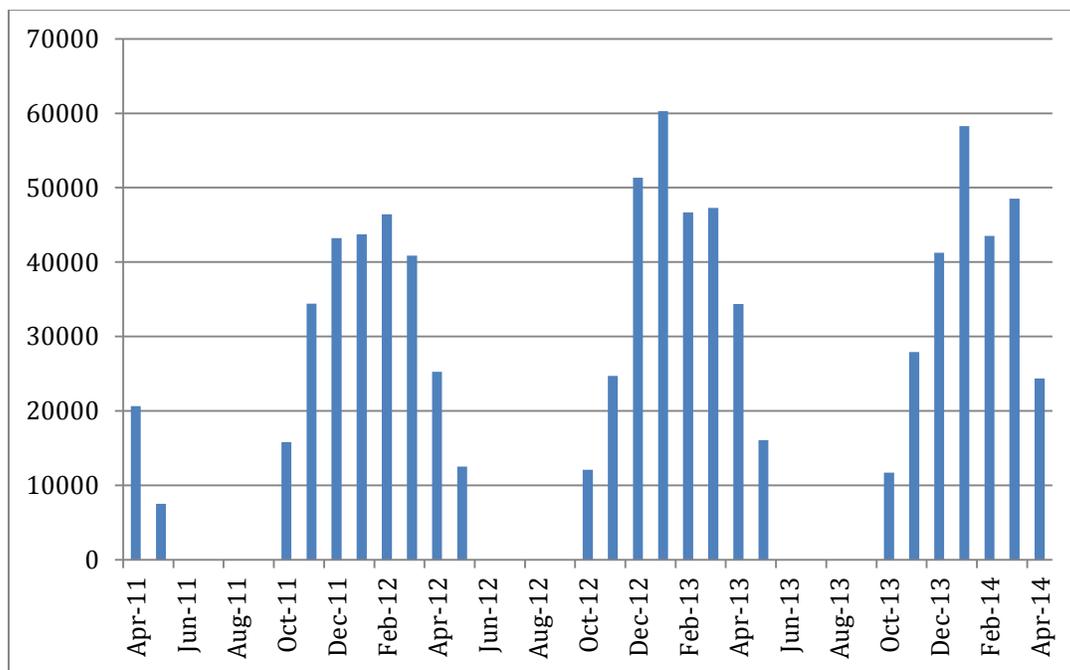
Website visits – 243,923

Users – 55,012

Page views – 602,655

We received **124** observation reports from the public this season. This gives us additional eyes and ears in the backcountry and significantly improves our understanding of current stability.

Videos on the website continue to be a popular teaching method. We posted **37** videos through Youtube this year. Combined, they were viewed **9,714** times.



Website visits since 2011

Education and Outreach



Southcentral Alaska Avalanche Conference

The CNFAIC staff, along with the Alaska Avalanche School and APU, organized a snow science conference for local snow safety professionals, students, and interested backcountry users. The event was a success, with 120 people attending. This event will become an annual gathering in November. Check out the latest information at www.akavalancheworkshop.org

<u>Education and Outreach</u>				
Date	Location	Outreach Type	Presenter	People Present
10/5/2013	Denai'ina Center	Oxygen and Octane Show	Graham	60
10/18/2013	AMDS	AMDS Open House Event	Graham	25
11/1/2013	APU	Southcentral Alaska Snow and Avalanche Workshop	Graham/Kevin/Wendy	120
11/21/2013	Bethel (Skype)	Lego Robotics – Natural Disasters (avalanche)	Kevin	10
11/26/2013	Oceanview elementary	Lego Robotics – Natural Disasters	Graham	5
11/26/2013	GRD	Fireside Chat (Intro to Avalanches)	Wendy	6
12/3/2013	AAS	Fireside Chat (Rescue)	Kevin	17
12/3/2013	REI	Basic Avalanche Awareness Talk	Wendy	30
12/10/2013	GRD	Fireside Chat (Human Factors)	Fitz	15

12/11/2013	Alaska Public Media	Outdoor Explorer radio show. Avalanche awareness interview with Charles Wohlforth and Aleph	Kevin	lots
12/14/2013	Girdwood Library	CNFAIC operations/season history - Level 1 AIARE	Wendy	
12/17/2013	AAS	Fireside Chat	Wendy	20
12/19/2013	AMDS	Rescue Tech Workshop	Graham	20
1/7/2014	REI	Basic Avalanche Awareness Talk	Wendy	65
1/13/2014	Turnagain Pass	Observer Training for CNFAIC and Level 2 refresher	Wendy	9
1/16/2014	Turnagain Pass	CNFAIC operations talk with APU outdoor studies class	Kevin	12
1/24/2014	Girdwood school	Avalanche intensive module for 10-12 yo students	Kevin	20
1/26/2014	Girdwood Library	CNFAIC operations/season history - Level 1 AIARE	Graham	12
1/29/2014	GRD	Intro to CNFAIC w/ JBER personnel	Kevin	8
2/1/2014	Seward	Avalanche Awareness	Alex	9
2/1/2014	Manitoba Hut	Youth group (CNFAIC intro and education)	Wendy	14
2/5/2014	Alaska Public Media	Hometown Alaska radio show - Weird Winter Weather	Wendy	lots
3/6/2014	REI	Season History/Awareness talk	Fitz/Wendy	40
3/8/2014	GRD	Level 2 NSP - Forecasting, CNFAIC	Fitz	10
3/20/2014	Trailside School	Trailside Elementary Talk	Wendy	20
3/23/2014	Turnagain Pass	Rescue Workshop	Wendy/Graham	10
3/28/2014	GRD	APU snow science class- Forecasting, career tracks	Fitz/Wendy	18
4/10/2014	Arctic Man	Rescue Workshop	Fitz/Wendy	6
4/12/2014	Arctic Man	Rescue Workshop	Fitz/Wendy	7
4/2014	Arctic Man	Booth-General Outreach	Fitz/Wendy	hundreds
Also:		Weekly talks on am 650 radio – AMDS radio show	Graham/Kevin/Wendy	

ARCTIC MAN 2014

Continuing Outreach to the Snowmachine Community

For the third season now, the CNFAIC provided avalanche outreach at the world-renown Arctic Man ski and snowmachine event north of Paxson, Alaska in the Hoodoo Mountains. We were very excited to partner with the Alaska Avalanche School and increase exposure for our respective products. Forecasters attending were John Fitzgerald and Wendy Wagner along with Aleph Johnston-Bloom with the Alaska Avalanche School. Main outreach opportunities included:

- Two rescue workshops for the public - we even got the Alaska State Troopers to join in
- Avalanche booth with current events, avalanche information, brochures and stickers of course
- Radio spots with KZND
- Presentation of 'who we are and what we provide' at the pre-race ceremony



The 'Avalanche Outpost' was set in an ideal location: near the Troopers headquarters and the beer tent! Above, Aleph chats up avalanche education and information products with a passerby.



Rescue workshop



Troopers honing their skills



Briefing the public

Near Miss Avalanches

Location: Turnagain Pass

Tincan mountain - Lower CFR, West aspect

Date: Jan 3rd, 2014

Tincan avalanche, dog fully buried, presumed dead

January 3rd, 2014

2:50pm

HS-AO-D2.5-R2.5-O/G

(AO - Triggered by skiers and/or dog)

Vertical Fall of debris - 600 feet

Horizontal width at starting zone - 400 feet

Slope angle - estimated 45 degrees in start zone.

Crown depth - up to 3 feet

West aspect

Crown elevation - 2600 feet

A group of 4 experienced skiers and 2 dogs had been skiing laps on Tincan since the morning. At approximately 2:45pm, the group skied down the windblown ridge, commonly called CFR, to the lower face where fall line transitions from a southwest to a west aspect. As the 4 were looking at the steeper slope below, one dog ran down the slope. The skiers felt the slope collapse and the avalanche initiated. The people were at the very top of the slab and scrambled to avoid being taken down themselves, but were not caught. They watched the dog in the flowing debris until it went out of sight in a powder cloud.

The group had good visibility of the runout and confirmed that no other people were caught in the avalanche. They yelled to others nearby to relay that all people were safe and accounted for, but the dog was missing.

The skiers performed a visual search of the debris to see if the dog was visible, with nothing found. At this point others from the area came over to offer help. Spot probing was initiated in terrain transition areas (convexities and benches) where debris had collected into deeper pockets. Witnesses pointed out the dog's fall line trajectory (roughly center of the slide path) and the search was focused in that area. About 12 people helped search with spot probing and a course probe line. No probe strikes were detected. Debris averaged 4-5 feet deep, with pockets that were over 9 feet deep. The search was abandoned at 4:25pm as darkness approached.

Analysis

The most recent storm was Dec 31st/Jan 1st, when nearly an inch of SWE fell at the Center Ridge SNOTEL site with 9 inches of recorded snow. Strong wind, exceeding 90mph was recorded at Sunburst during this storm. This storm produced an active avalanche cycle, including large naturals and explosive triggered slides. January 2nd and 3rd brought calm weather with little wind, mostly cloudy skies, and

temperatures in the mid 20s F.

The snowpack consisted of several known weak interfaces. The layers near the ground were weak and loose faceted grains with little strength. In the mid pack a freezing rain crust from early December had been the most significant problem layer in the days leading into January 3rd. Test pit scores indicated moderate to high strength, but a tendency to propagate - either on top of or below the crust layer. Frequent collapsing was reported by skiers, including on the day of this event. Average snow depth in the area was less than 3 feet from an unusually dry early winter.

On January 2nd, the day before this event, a group remotely triggered several avalanches on the upper Tincan mountain. These slides were highly visible to anyone who toured to the top of Tincan common on Jan 3rd. Avalanche danger according to the CNFAIC was Moderate above treeline on January 2nd and 3rd, although in hindsight given the number of reported avalanches, the danger should have been listed as Considerable. Skier triggered avalanches were reported on Eddies, Sunburst, and Tenderfoot. A snowmachiner reported seeing a large avalanche in Bowl 2 on Seattle ridge with unknown trigger. All of these events showed a tendency for remote triggers and propagation across significant distances.

What likely happened was a collapse at the early December crust interface. The trigger may have been the 4 skiers near the ridge crest, the dog on the slope, or a combination. That collapse propagated across the steep slope, initiating the avalanche. As the slab fell it stripped the weaker and deeper layers, in some places all the way to the ground.

Looking into the future, this persistent slab problem will not heal quickly. This is a shallow snowpack, continental type problem where stability will remain poor for days or weeks following storm events.

Photo 1. Crown face at the skier's left side of the avalanche



Photo 2. Illustration showing approximate area of avalanche

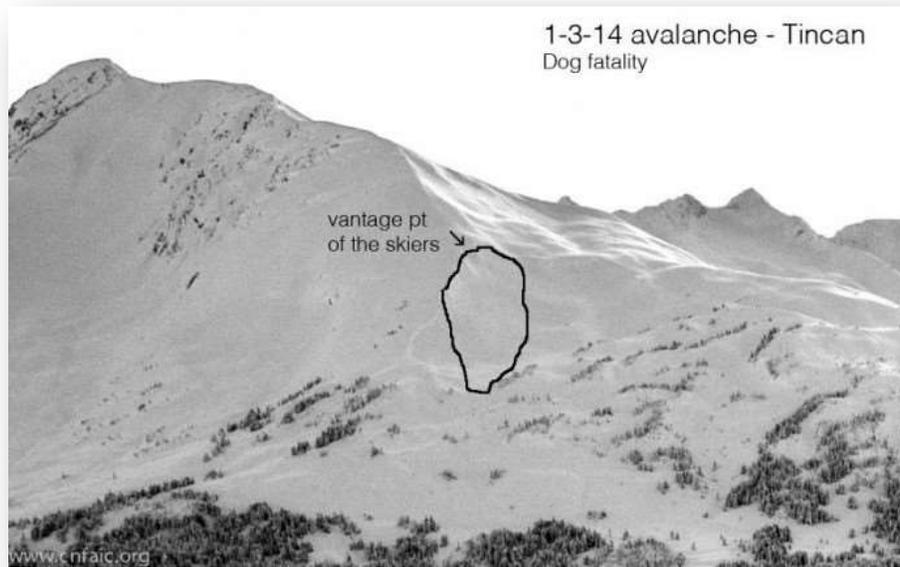


Photo 3. Debris, looking uphill to the crown



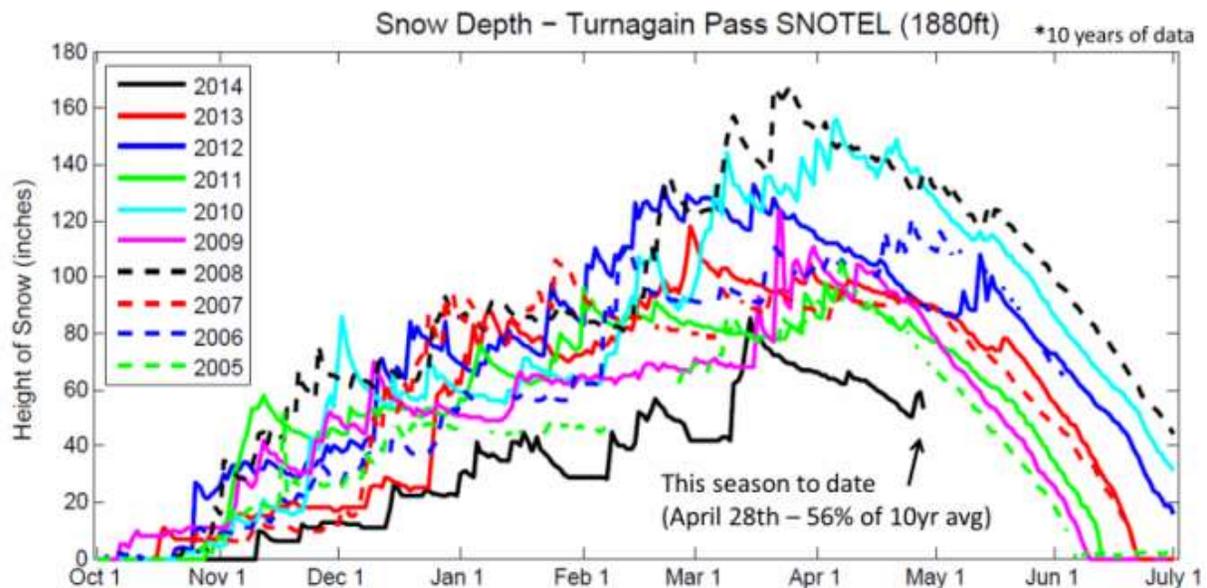
Photo 4. View from the standard skin track

Snowpack and Weather Summary

Copies of the detailed monthly weather graphs can be found at:

http://www.cnfaic.org/wx/wx_history.php

For anyone that got out into the mountains, it is no surprise that we hovered between 50 and 60% of our average snowpack for the most part of this season. The fact that the alders never laid down can attest to that. Accumulated precipitation, on the other hand, was typically in the 80-90 percentile thanks to significant rain up to, and over, 2,000' during October and late January.



October

October was characterized by several warm and wet storms. Although 10.8" of precipitation was recorded at Turnagain Pass' mid-mountain SNOTEL site (1880'), it was almost all rain with the snow depth sensor never reading above 0". A blocking high pressure not only brought in November but the snow we did have had begun to facet. Therefore, we started off the season with around a foot of faceted snow above 2,500' and bare ground below that.

Water - 10.8 inches

Snow - 0 inches



Seattle Ridge from the Center Ridge parking lot (November 6th, 2014)

November

Three distinct periods of high pressure dominated November with two modest snowfall events between them. After two weeks of clear weather, 12" of snow fell on November 9 and 10th, then another 13" fell between the 22nd and the 26th. Shallow soft slab avalanche activity endured at the tail end of these colder storms. The majority being skier and snowboarder triggered slides one to three days after the storm; the motorized area was still closed due to lack of coverage. We did not receive any reports of people caught.

The CNFAIC began issuing advisories on November 22nd just as the second storm was getting underway. Our first forecast had a Considerable danger rating above treeline for storm slabs and wind slabs 12-18" thick. As December arrived the snowpack consisted of two layers of "November facets", due to the many days of high pressure between storm cycles, which sat on top of the "October facets" at the upper elevations.

Water - 2.6 inches
Snow - 25 inches



Tincan's Common Bowl. The fourth skier down triggered this D2 soft slab avalanche (November 22nd, 2014)

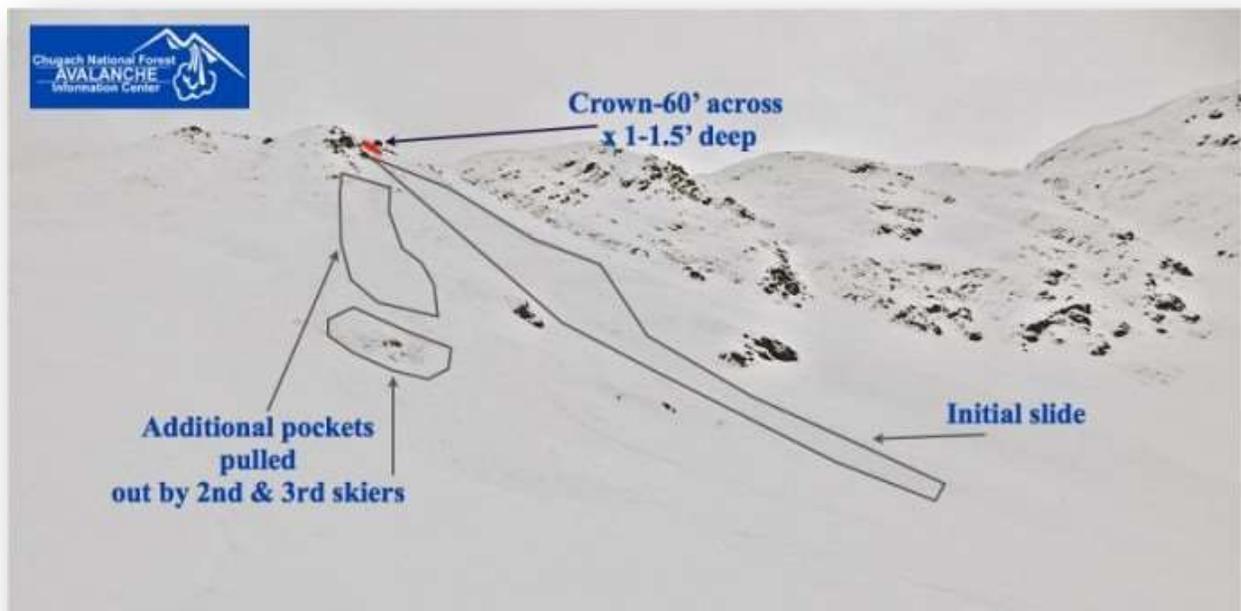
December

Warm weather fell across our region during the first week of December. On the 5th a drizzle event occurred with light rain in some areas. Temperatures plummeted on the 11th and we were left with a thin translucent crust (aka the 'drizzle' crust) capping the November faceted snow – it goes without saying, this was a very concerning set up. Beginning the night of the 12th and extending through the remainder of the month was a series of 5 storms. The largest of these was the first and it laid down 18" of low density snow in 3 days. Several remotely triggered avalanches soon followed on the 15th and 16th when visibility allowed for travel above treeline.

Following each storm that rolled through there was a several day period of remotely triggered avalanches. The 'drizzle' crust was the bed surface for all the events we were able to inspect and the weak layer was a thin layer of facets above the crust. Widespread collapsing and remote triggering became a theme. The first reported "caught and carry" of the season was December 26th on the Magnum Ridge – no injuries. As January approached and the slab above the facet/crust combo thickened, the size and consequences of avalanches increased along with our concern.

Water – 3.4 inches

Snow – 41.2 inches



January

January was the month to remember. After a typical winter-time start with only 6 out of the first 16 days with no recorded snowfall, it seemed winter was finally upon us. The alders started to bend and cover with snow and although avalanche conditions were downright scary, there was hope for more snow and recovering stability. The closest call of the season occurred during this cycle on January 3rd. On this day a party of four skiers with two dogs triggered a large D2.5 avalanche from the Tincan Ridge. The slab pulled to the ridgeline and caught two of the skiers. Luckily they were near the crown and able to scurry off, yet one of the dogs was low enough on the slope and was carried down. The dog was buried and despite many volunteers who helped probe the debris, the dog was not found.

The optimism for winter came to a screeching halt on January 17th when 2.2" of rain fell up to 2,000'. This was the first day of a 10 day long stretch of warm and wet weather associated with a stream of moisture being pumped our way from the tropics. In these 10 days 5.9" of rain was recorded up to elevations as high as 4,000'. A spring-time 'shed cycle' began and widespread full depth wet slab avalanches, up to D4s, were not uncommon. The avalanche activity continued until the 27th when temperatures finally cooled off and skies cleared.

'Jun-uary' ended with a whopping 28 days of avalanche danger at either High or Considerable. As we headed into February, much of the snowpack had been lost below 1,000' and above this a saturated pack existed that became moist above 3,500'. The December 'drizzle' crust was a thing of the past and the January 'ice' layer was now the new problem.

Water – 9.2 inches

Snow - 41 inches



The West face of Pyramid Peak. The looker's right portion slid on Jan 23rd while the left slide on the 27th. Skies were clearing and the surface was re-freezing on the 27th, opposed to rain on snow triggering the right side – a head scratcher.

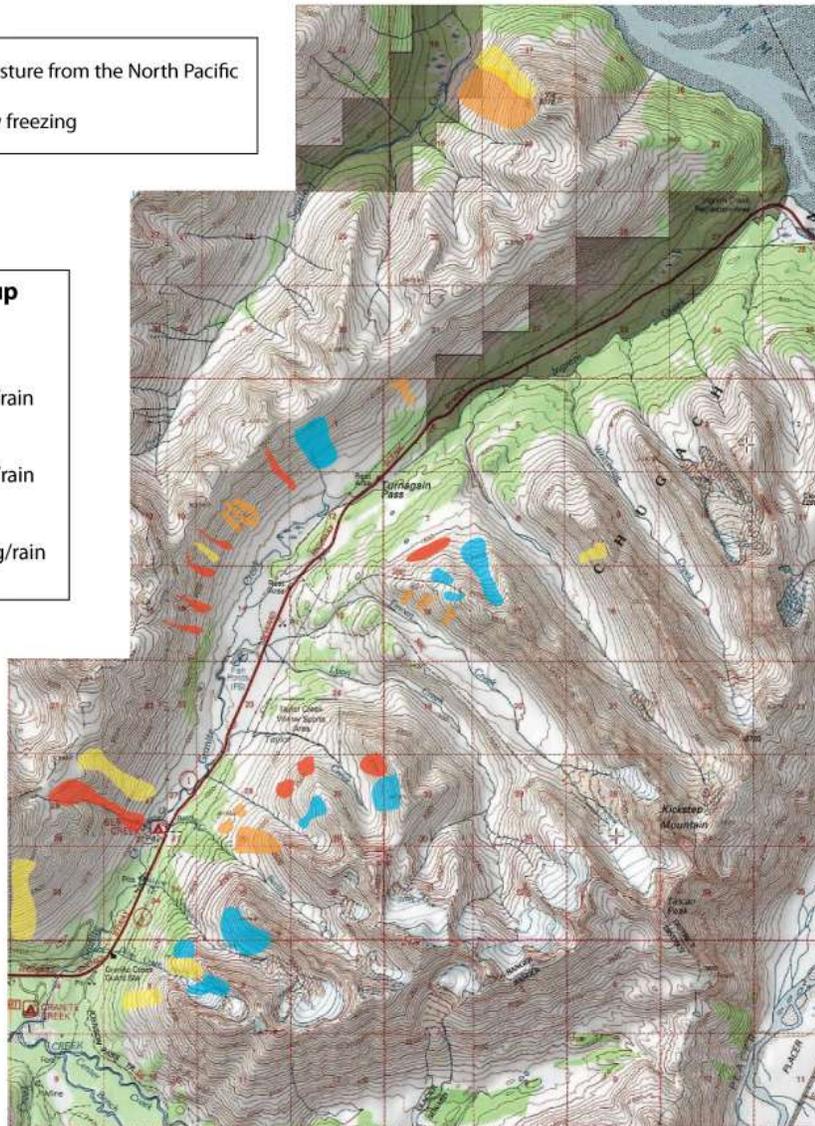
January Avalanche Occurrence Map
 Observed Avalanches Preceding and Throughout an Extreme Warming and Rain-on-Snow Event:
 Turnagain Pass, Kenai Mountains, AK

1-17-2014: Arrival of warm air and moisture from the North Pacific

1-28-2014: Temperatures cool to below freezing

Avalanche Occurrence Group

- Between Jan. 1 and Jan. 16
Previous to warming/rain
- 0-4 days after onset of warming/rain
Rain/snow line = 2000ft
- 4-8 days after onset of warming/rain
Rain/snow line = 2500ft
- 8-10 days after onset of warming/rain
Rain/snow line = 4000ft



February

After the January melt-down, Winter Part II arrived in February. The first week of cool temperatures and clear skies turned the snowpack into a solid block of ice below 3,000'. Above 3,000 there was a January crust that ranged from ~30+cm thick to ~3mm thick at 5,000'. On the 7th, a weak low pressure dropped out of the North and surprised everyone with 18" of cold smoke: only 1" of water. The next ten days brought 33" of additional snow and once again hopes were rising that the alders would lay down.

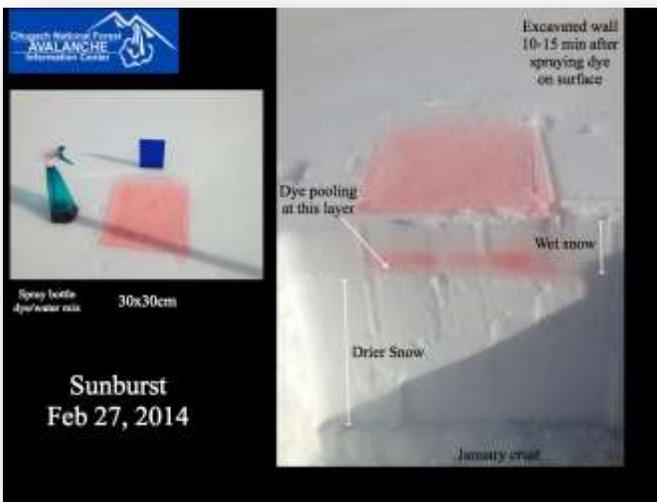
During this time a 1-10cm layer of facets – even some depth hoar – was forming above the January ice layer due to melt-layer recrystallization. This faceted layer became quite reactive

and from February 8th till the 23rd there were several remote and human triggered D2 avalanches. Most of these were several days after snowfall and we returned to dealing with a persistent slab problem. For the last three days of February, believe it or not, spring weather hit again. This time we only had .2" of rain but it was enough to melt the surface and begin a melt-freeze regime as March approached.

Water – 4 inches
Snow - 51 inches



Natural avalanche next to tracks on Sunburst's Southwest face (February 22nd, 2014).



Observed Avalanche Activity During February 2014 Turnagain Pass, Kenai Mountains, AK

Feb. 7 Storm

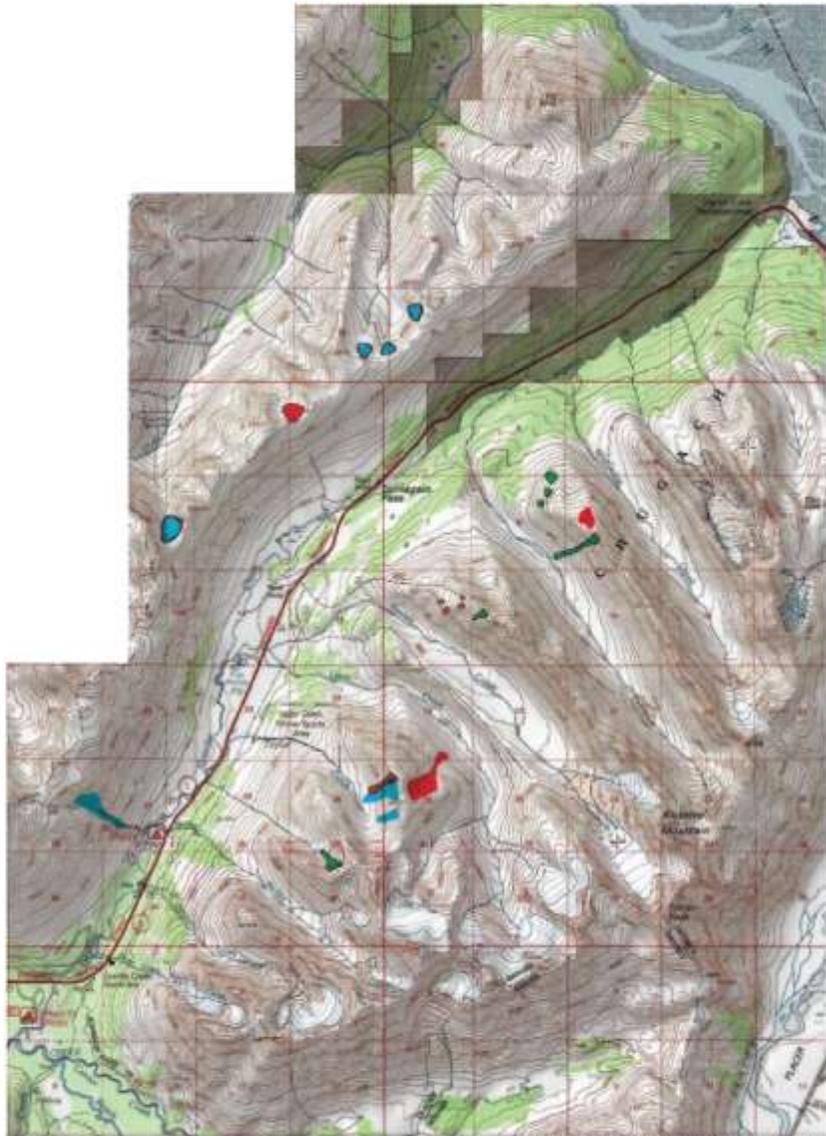
- Accumulation of 16-18" of snow onto a late January melt freeze crust.
- Average wind speed near 60mph from the East
- Natural, human, and remotely triggered avalanches occurred from Feb. 7 to Feb. 10, during which time minimal snow accumulations and insignificant wind loading were observed

Feb. 14 - 18 Storm Cycle

- Feb 14: Accumulation of 12-14" of snow.
- Feb 16 - 18: Accumulation of an additional 12-14"
- Average wind speeds near 70mph
- Natural avalanche activity likely occurred during storm but could not be observed due to low visibility
- Human, and remotely triggered avalanches occurred between Feb. 14 to Feb. 17

Feb. 22 - 23 Avalanche Cycle

- Winds picked up with averages from 26 - 38mph and gusts up to 67mph.
- Rapid wind loading was observed, with subsequent natural and human triggered avalanche activity.



Map produced by CNFAIC Intern Katie Johnston

** Human triggered avalanches outlined in black**

March

Although March began with 9 days of mostly sunny skies and melt-freeze conditions, on the 10th Winter Part III began with a vengeance. A classic Chugach storm deposited 5 feet of sticky medium density snow in 5 days. This fell on a variable crust formed earlier in the month and initial bonding was poor. Several D3 and some D4 avalanches occurred at the tail end of the storm. On the first sunny day after the storm a handful of remotely triggered avalanches released by both skiers and snowmachiners. One of these was a D3 that covered snowmachine tracks lower on the slope from just moments prior (photo below).

The stability improved fairly quickly after the March 10-14 cycle. From the 17th through the remainder of the month, a blocking high pressure allowed for travel into our classic steep terrain with only sluffs reported. This period of good snow, good stability and sunny skies brought some much needed mental health after a challenging season thus far.

Water – 5.9 inches

Snow - 58 inches



D3 avalanche in motion, remotely triggered from a party on the ridge. (Photo: Mike Davis)



Observed Avalanche Activity During March 2014 Turnagain Pass, Kenai Mountains, AK

March 10 - 16 Weather

- A warm, wet weather system deposited 3 - 5' of snow in the Turnagain Pass region.

- Winds averaged from 20-50mph with gusts over 100mph.

- The rain/snow line fluctuated between 1000ft and 1400ft.

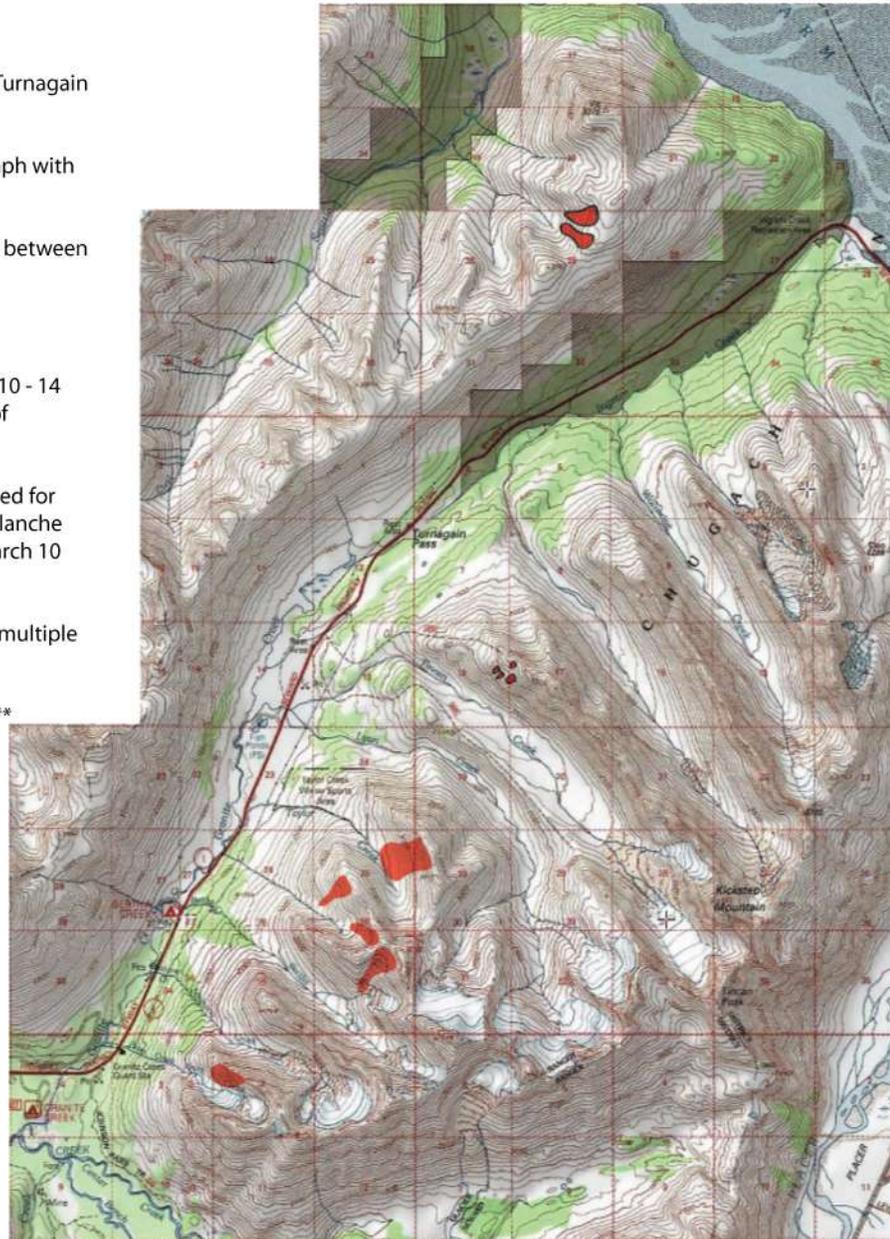
March Avalanche Cycle

- Limited visibility from March 10 - 14 prohibited daily observations of avalanche activity.

- Clear skies on March 15 allowed for observations of the natural avalanche cycle that occurred between March 10 and 15.

- On March 15 there were also multiple remotely triggered avalanches observed.

****Indicated with a black outline****



Map produced by CNFAIC intern Katie Johnston

April

The first ten days of April was a continuation of winter. Despite the growing daylight hours, cold snow and good stability remained. On the 7th and 8th a small system added another 8" to our

meager overall snow depths. This was followed by a bone fide corn cycle for the next two weeks. Just as we were closing up shop for the year another 12" was deposited on the 25th and 26th. April 27th was our final advisory and on April 28th a snowboarder triggered a D2 damp/wet slab. He took a 1,000' ride over rocks and was lucky to come away with no injuries. As of this writing the new snow from the 25/26th is transitioning to corn and a high pressure is setting in as May arrives.

Water – 2.2 inches

Snow – 18 inches



Gorgeous weather and calm winds in April allowed us to fix and quality check the ridgetop weather stations.



Two days after a late April storm brought 10-20" to Turnagain Pass, a snowboarder (second on slope) triggered this damp/wet slab avalanche in the North facing chutes of Tincan. Photo taken by party involved.

Finances and Fundraising - The Friends of the CNFAIC

The Friends of the CNFAIC continues to be instrumental to operations. Fund raising continued to be very successful with a fall slide show and auction, annual memberships, corporate and private donations, and the Pick, Click, Give campaign. The Avalanche Center could not function in its current capacity without the financial and volunteer support of this dedicated group of people.



Thanks for
Another
Safe and
Successful
Year!

L to R: Katie (intern),
Wendy, Graham, Kevin,
and Fitz.