Chugach National Forest Avalanche Center
2020 - 2021 Annual Report

Glide avalanche on Mt. Marathon in Seward in April. Seen from town.

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Aleph Johnston-Bloom
Wendy Wagner
Andrew Schauer
Graham Predeger
Eric Roberts (CNFAIC Intern)
Message from the Director

It was November 23, 2020 when I found myself looking up historical records to find the earliest dates the Chugach National Forest had enough snow to open Turnagain Pass to motorized use. As it turned out, it was 9 years ago. It opened on Thanksgiving weekend...and we were going to match that! Snow really began to fall in early-November, our first advisory was November 22nd, and by January 18th there was 11 feet of settled snow on the ground. Mountain goers were begging for a clear day to enjoy the white landscape and buried alders. Be careful what you wish for, they say. Not only did we get a clear(ish) day, we had over 30 of them. Thanks to a wonderfully cold winter, most of the snow stuck around for our enjoyment and many folks were able to explore regions that are often inaccessible.

Internal operations at the CNFAIC began with the welcoming of Andrew Schauer as our new third forecaster, rounding out the team of Aleph Johnson-Bloom and myself. Andrew cut his teeth in Montana working with the Gallatin NF Avalanche Center and the West Central MT Avalanche Center. He is no stranger to Girdwood or Turnagain pass, however, and is working now on terrain complexity maps for our region. Aleph, the lead forecaster, just finished up her sixth season. Aleph took on a plethora of behind-the-scenes work, as usual, and much of our success can be attributed to her efforts. Graham Predeger stepped back to an ambassador role, pinch hit a couple forecasts and assisted with several education and outreach events.

Our first order of business was to resolve how to fully operate under COVID-19 safety protocols. I’m grateful to say that we were successful in our plan, which was compiled in large part by Aleph. Next was keeping up with the impressive snowfall, avalanche activity, virtual meetings, clear spell, working with our non-profit Friends group, and more. It was wonderful to see over 150 people tuning in to our special topic virtual outreach events through the early winter!

The season wound down quickly with an exciting springtime avalanche cycle and excellent corn harvesting that continues into May, as I write this. We had many highlights, some impressive stats and as always, a herculean effort from our community to not only support the avalanche center, but allow us to thrive. Please take a moment to read through this snapshot of our season. Thank you to all of the people who have supported this avalanche center, both from outside our framework and within. It is an honor to work with such a dedicated and professional team of forecasters. A sincere thank you to our team, the US Forest Service, and the community as a whole for their longstanding support and dedication.

-Wendy Wagner, CNFAIC Director
Acknowledgements

Staying safe in avalanche terrain is a community effort!

From the public user, to the avalanche professional, to those who have submitted observations, to industry and corporations, and all of you that have become members of our non-profit Friends of CNFAIC, donated, or simply read our daily advisories, THANK YOU immensely!! This is the foundation we continue to build upon. We could not do this without our nonprofit arm, the Friends of CNFAIC. Their tireless work is a conduit to the community. Please see the “Finances and Fundraising” section at the end of the report for specifics on the Friends group!

Getting down to business at the Avalanche Center means assessing snow stability and avalanche conditions, forecasting the weather, recording data endlessly and assimilating professional and public observations. The entities listed below are absolutely critical for producing accurate avalanche forecasts. We would like to extend a special thank you to the following organizations and individuals for sharing their valuable information and insight:

- Alaska Avalanche School
- Alaska DOT&PF
- Alaska Railroad
- Alaska Guide Collective
- Alaska Pacific University
- Alyeska Ski Patrol and Snow Safety
- Chugach Powder Guides
- Chugach Electric
- The over 200 public users who submitted snow/avalanche observations through our website!!

Zoom meetings left and right! This one is with the all the USFS avalanche center directors for a Spring catch-up session.

HUGE Thanks to our local guiding operations for their longtime support and information sharing!!
Partnerships

Forecast accuracy is directly related to our Partnerships, providing resources and data.

Resources: Having the proper gear to perform the job safely is vital. We are grateful for support from Black Diamond (avalanche safety equipment), Alaska Mining and Diving Supply (AMDS – snowmachine gear, support and the machines themselves), A2D Sledworks (snowmachine parts and labor), Ski AK and Powderhound Ski Shop (skis and ski gear).

Data: Avalanche science is based on data. We rely heavily on our partners at the National Weather Service (who provides tailored mountain weather forecasts and issues avalanche warnings), BeadedStream/KCI (provides the equipment and hosts snow temperature data on Tincan), and Alaska Pacific University Snow Science Program (installs and monitors snow study equipment and observations).
COVID-19 Safety Protocol

The CNFAIC forecasting staff was happy to operate at full capacity this season. Last spring, on March 28th, 2020 the CNFAIC made the very difficult decision to suspend our avalanche forecasting products for the remaining two weeks of the season. After a summer of uncertainly, by fall 2020 it was clear that our Forest Service leadership would assist the avalanche center with ‘risk assessment’ tools and support our proposed COVID-19 protocol. Here are the measures we put in place:

- Telework was implemented for regular office time
- Forecasters were assigned a vehicle for the season to be used solely by that employee
- Field partners were required to provide a COVID-19 screening form on the morning of field days
- No field partners/volunteers were allowed in vehicles unless they were part of the employee’s household
  - In the spring, one field partner was allowed in a vehicle if both individuals were fully vaccinated
- Masks were worn anytime employees were indoors or within 6 feet outdoors
- Outreach events and meetings were accomplished virtually

As many can attest, we all became quite proficient in ‘Zoom’ and ‘Teams’. And, although it was a different working environment without office chatter and a lot of face time, it was a big success to end the year with healthy staff and field partners!

Aleph assessing the snowpack on a sunny day at Turnagain Pass
Forecasts and Statistics

The first weather and avalanche Conditions Summary of the season was posted on October 28th. CNFAIC staff issued these every few days in November as the snow started to stack up. The first forecast was issued on Nov. 22nd with CONSIDERABLE avalanche danger and daily forecasts started November 28th. Daily forecasts continued until April 18th and then transitioned to 4 days a week until May 1st, when the center staff posted the Springtime Avalanche Tips and closed up shop for the 20/21 season.

Turnagain Pass Forecasts: **151**  Avalanche Warnings: **3**  Special Avalanche Bulletin: **1**

**Turnagain Pass Forecast**

*Archived Forecast - All forecasts expire after 24 hours from the posting date/time.*

**Avalanche Warning**

*Issued: January 11, 2021, 7:00 AM*

Travel in avalanche terrain is not recommended. Avoid being on or beneath all steep slopes.

The Bottom Line

We have extended the Backcountry Avalanche Warning through the National Weather Service today. With heavy snowfall, rain, and strong winds the avalanche danger remains HIGH in the mountains surrounding Turnagain Pass, Girdwood Valley, Portage Valley, and areas on the Kenai including Summit Lake and the Seward/Lost Lake zone. Dangerous avalanche conditions are expected on all slopes 30° and steeper – including runout zones. Large avalanches are expected to release naturally, be easily triggered by people and send debris to valley floors. **Travel in and below avalanche terrain is NOT recommended.** Areas with steep slopes above should be avoided, such as the Byron Glacier Trail and the Seattle Ridge Uplink. Even small terrain features could act as deadly terrain traps.

The National Weather Service has issued a Special Weather Statement with this storm.

**Website Stats:**

May 2020 through April 2021

- Unique Visitors: **128,194**
- Total Visits: **499,132**
- Page Views: **2,826,594**

Remote triggered avalanche in Grandview, no one caught, 3.12.21, Photo: Andrew Schauer
Forecasts and Statistics (Cont.)

Social Media

Facebook: Friends of CNFAIC
Followers: 7781

Instagram: @chugachavy
Posts this season: 100
Followers: 7924

YouTube: ChugachAvalanche
Videos this season: 32

Traditional Media Appearances

TV/Online News/Print/Radio: 12

CNFAIC Director Wendy Wagner on Talk of Alaska: https://www.alaskapublic.org/2020/11/30/is-the-pandemic-pushing-more-people-into-avalanche-zones/
Observations

We really can’t say thank you enough to all the people who take the time to submit observations. We greatly appreciate all the information and photos submitted to the Chugach National Forest Avalanche Information Center. This crowd-sourced data significantly elevates the quality and accuracy of the forecast and provides a platform for information in areas outside of our forecast zone.

Observations per Region

Total: **671**  
Chugach National Forest: **443**  
Hatcher Pass: **161**  
Chugach State Park: **67**

*Skier triggered avalanche in the Library caught on camera from Center Ridge on 1.31.21 by public observer Andy Moderow.*
Public Outreach

As with most public in-person events during COVID times, the CNFAIC transitioned all the public outreach to Zoom for the 2020/21 season. Each staff member hosted a forecaster chat with a special guest (or two). We hope these can be back in person next season!

CNFAIC Forecaster Chat # 1 – Weather. Avalanche center director Wendy Wagner was first off with special guest Kyle Van Peursem from the National Weather Service. Wendy took a quick look at the current weather and snowpack situation and then handed it over to Kyle for Online Weather Resources: Tools and Tips for Finding the Perfect Powder Day and the 2020/2021 Winter Weather Outlook.

CNFAIC Forecaster Chat # 2 – Persistent and Deep Persistent Slabs. Lead forecaster Aleph Johnston-Bloom gave an overview of how persistent weak layers form and a few notable Persistent Slab/DPS avalanche cycles from the Turnagain Pass forecast area. Special guests HPAC forecasters Allie Barker and Jed Workman talked about these avalanche problems at Hatcher Pass.

CNFAIC Forecaster Chat # 3 – How the Sausage is Made: What goes into an avalanche forecast? Forecaster Andrew Schauer talked about everything that goes into writing the avalanche forecast and discussed the North American Avalanche Danger Scale with National Avalanche Center Director Karl Birkeland.

CNFAIC Forecaster Chat # 4 – Snowmachine Specific: Head on a Swivel! CNFAIC ambassador Graham Predeger led a snowmachine specific discussion on good riding habits with snowmachine educator and rider Tim Thomas from Haines
Southcentral Alaska Avalanche Workshop (SAAW)

This year’s Southcentral Alaska Avalanche Workshop (SAAW) was held virtually on Zoom. We were recipients of the American Avalanche Association’s Snow and Avalanche Workshop Grant again this season. We are grateful for their continued financial support of the Alaskan avalanche community and making our 8th SAAW possible, even during tough financial times for non-profits. The SAAW organizing committee was thrilled to be able to still provide a continuing education opportunity for the community and get the 20/21 avalanche season off to a great start.

2021 Speaker Line up:

Mike Janes, Alaska Electric Light & Power in Juneau: Applying Technology to Remote Avalanche Forecasting

Laura Maguire, Research Engineer Ohio State University: Cognition in the Wild: A closer look at the complexity and challenge of avalanche forecasting


Mike Buck, Alaska Avalanche Information Center & Alaska Avalanche School: Avalanche Evaluation on Deep Backcountry Snowmachine Trips

Katreen Wickstrom-Jones, Cryosphere Hazards Scientist: Community Snow Observations

Avalanche Near Misses

A near miss is defined by OSHA as an incident where ‘no personal injury was sustained, but where, given a slight shift in time or position, damage or injury easily could have occurred’. In the world of snow and avalanches, we think of a near miss as an accident that does not result in a fatality, but very easily could have. They typically involve people being caught, carried, and partially or fully buried by an avalanche. We received multiple reports of near misses in Chugach State Park and two on the Kenai. These all fell outside of our advisory area. We did have one such incident within our advisory area, which occurred on the back side of Seattle Ridge in late December. Luckily, the group was able to self-rescue and nobody was injured in the incident. Of the many other human triggered avalanches in our advisory area, no other incidents resulted in partial or full burials.

Warm-up Bowl (Seattle Ridge)
Non-fatal incident, 12.23.2020

Synopsis:
A snowboarder, who was the 5th person on the slope, triggered a very large and connected fresh wind slab avalanche. The boarder was caught and carried approximately 500 vertical feet. They deployed their airbag and when the debris came to rest, they were buried up to their neck. The boarder was dug out by their partner(s) and was OK. The group had accessed the area by snowmachine. The debris buried one snowmachine 5-7' deep, and partially buried another machine. Both machines were at the bottom on the slope when the avalanche occurred. No other group members were caught.

This was a very large wind slab that failed on a layer of precipitation particles at the new/old snow interface from a storm on 12/22. The storm deposited around 3' of moist sticky snow, which was blown into large wind slabs by 50-100mph winds the prior day. The winds were so strong that much of the loading occurred mid-slope, rather than closer to the top of the slope. The average crown depth was 2', but there were sections with a depth of up to 4' or deeper. The avalanche propagated approximately 1000' wide and ran roughly 800 vertical feet.

More information: https://www.cnfaic.org/observations/seattle-ridge-warm-up-bowl-1-bowl/
Fatalities

Southcentral Alaska had two separate fatal avalanches this season, resulting in four deaths. Neither incident occurred within the CNFAIC operational area. The first accident occurred on February 2nd in Chugach State Park, claiming the lives of three climbers as they were caught in an avalanche while ascending a 2,500’ steep gully. The second occurred on March 27th, when a skier was caught in an avalanche in the mountains close to the toe of the Matanuska Glacier. In addition to these avalanche accidents, five people lost their lives in a helicopter crash near the Knik glacier on March 27th. This accident was a tragic loss to our outdoor community as it occurred during a heliskiing operation claiming the lives of two well-known and well-respected ski guides. Our condolences go out to the families and friends of those that perished.


More information from the Matanuska Glacier accident in this media article: https://www.adn.com/alaska-news/2021/04/01/others-in-heli-ski-group-witnessed-avalanche-that-buried-fairbanks-skier-near-matanuska-glacier/


February 2021 was the deadliest month for U.S. avalanche accidents going back as far as records have been maintained. There were many contributing factors at play, including an unusually dangerous snowpack in the lower 48, and a marked increase in backcountry traffic - which we absolutely experienced here in Alaska. By May 1st, 2021 the U.S. has seen 36 avalanche fatalities, tying the 2007/08 and 2009/10 seasons for the most fatalities since 1925/26. With 4 fatalities in Alaska, our season is slightly above our historical average of 3.5 deaths per year.
Snowpack and Weather Summary

Season Snowfall*: 389” | H2O*: 42.4” | % Normal Snowpack**: 102.9% | Snow Climate: Intermountain
*Data from the Turnagain Pass SNOTEL (1880’) from Oct 21 - April 30
*Based on median peak SWE value, 1981-2010

2020/2021 – WINTER SNAPSHOT

This season felt like feast or famine, with alternating periods of very dry or very stormy weather. Winter started in late October, with a few inches of snow followed by two weeks of cold temperatures, leaving us with a weak, faceted base to start the season. Heavy snowfall in November left us dealing with deep slab avalanches at the end of the month, which is unusually early for that type of avalanche problem. Snowfall continued through December and January. Though some of these storms brought mixed snow and rain as high as 2500’, most of our precipitation came in the form of snow, which provided some of the best mid- and low- elevation coverage that our area has seen in close to 10 years. Then along came February and March, when the faucet was abruptly shut off and we traded abundant snowfall for relentless winds. Alternating periods of clear, cold weather followed by modest storms left us dealing with multiple persistent weak layers in the upper snowpack that were slow to heal. Luckily, the great coverage from the beginning of the season provided good riding conditions despite the dry weather. In mid-April spring made a dramatic appearance with a storm that brought 2-5’ of snow over the course of four days, which was followed by sunny skies and temperatures that reached into the 40’s and 50’s F in the mountains. This period was marked by a widespread avalanche cycle which featured dry slabs, wet and dry loose, wet slabs, cornice fall, wind slabs, and glide avalanches. As of April 30th, our feast or famine season has left us with an accumulated snowpack that is almost exactly equal to the historical average.
**November**  
Monthly snow = **120”** Monthly H2O = **11.7”**

November started out dry before the weather really ramped up in the last two weeks of the month, bringing 92” of snowfall in 10 days. This impressive storm cycle built thick slabs on top of weak snow that had been developing facets in the beginning of the month, which led to large natural and human-triggered avalanches failing at or near the ground.

*The parade of Thanksgiving storms continues... avalanches have, and are likely to occur naturally... Slabs could be anywhere from 2-6’ thick. 11.28.2020.*

*Skier-triggered avalanches on Eddies (top) and on Tincan’s Hippy Bowl (bottom), 11.22.2020.*
December
Monthly snow = 72” Monthly H2O = 8.2”

December started with a warm storm that brought rain up to 2500’, which formed a crust that would remain a concern well into January. Most of the month was fairly quiet weather-wise, with a series of modest storms bringing consistent snowfall. The 12/21-12/22 storm was one of the most intense storm events of the season, bringing over 3.4” SWE with recorded gusts up to 133 mph. The storm led to a widespread natural cycle, and one large snowboarder-triggered avalanche that resulted in a partial burial (see ‘avalanche near miss’ section.

Yesterday’s powerful storm brought feet of snow to the mid and upper elevation terrain, inches of rain to sea level and multiple hours of sustained winds at ridgetops blowing 60-90 mph (with gusts as high as 129 mph on Max’s and 133 mph on Sunburst). 12.23.2020

Skier-triggered deep slab avalanche on Tincan Proper, 12.04.2020. Skier was able to ski off slab and avoid being caught.

January
Monthly snow = 131” Monthly H2O = 14.5”

January was snowy. A weeklong storm brought 8-10’ of snow to the upper elevations, equaling 8.8” SWE at the Center Ridge SNOTEL station. There were two days in January (12/11 and 12/18) where 24-hour storm totals exceed total snowfall and SWE for the entire month of February. All of the new snow resulted in several widespread natural avalanche cycles. A weak layer of near-surface facets and surface hoar that formed during the end of the month and was buried on 1/28 would present problems well into February.

Snow and rain have been falling on and off for the past few days. Large avalanches (1-4’ deep) are expected to release naturally, be easily triggered by people and could send debris to valley floors. (Taken from the 1/18 advisory, but applicable to a good chunk of the month of January).

CNFAIC intern Eric Roberts breaking trail on a storm day, 01.11.2021.

Aleph standing in an impressive snowpit, dug by all-star public observer and field partner Andy Moderow, two days later, 01.13.2021.
February
Monthly snow = 15” Monthly H2O = 1.9”

It seemed as though somebody shut off the faucet at the end of January, leaving us with consistent winds and a slight trickle of snow. Multiple wind events, most of them northwest outflow events, during the month resulted in at least 5 different avalanche cycles during which we saw natural and human-triggered avalanches throughout the advisory area. Due to the lack of new snow, we saw very few large avalanches. However, two persistent weak layers of buried surface hoar and near-surface facets that were buried in the last days of January and the second week of February would remain a stubborn concern through the entire month, contributing to a handful of larger avalanches following some of the wind events.

The winds will be at it once again. By noon today ridgetops will be seeing east winds averaging 30-40mph with stronger gusts. That’s pretty good wind for the small weather system skirting us by to the south… Unfortunately, the wind will only be accompanied by 2-4” of new snow, at best.

This natural avalanche on Comet was one of the larger ones from the month. It occurred during or immediately following the 2/9-2/11 storm, which brought most of the month’s snow and sustained 40 mph winds with gusts over 80 mph.

Multiple persistent weak layers in the upper snowpack in a snowpit from mid-February.
March
Monthly snow = 27” Monthly H2O = 2.7”

March never responded to our letter from the 3/1 advisory, though we did see slightly more snow than February. The month was largely dominated by high pressure and westerly winds, bringing clear skies, cool temperatures, and a plethora of persistent weak layers in the upper snowpack. These layers contributed to multiple skier-triggered avalanches immediately following wind and snow events, resulting in wide-propagating wind slab avalanches failing on buried facets and surface hoar.

Dear March Weather,
Please send lots of snow our way. The few inches in the forecast today won’t cut it and enough with the February wind events… We could use a good old crush n’ flush storm to get rid of the persistent weak layers and some powder would be lovely! Remember January? Just do that again. Thanks, Everyone
3.1.2021

Skier-triggered avalanche on Raggedtop, 03/21 (top), natural avalanche on 3/26 immediately adjacent to the 3/21 event (center), and a third natural avalanche on the same path on 04/01 (bottom).
April
Monthly snow = 17” Monthly H2O = 2.5”

April gave us a little taste of everything. The cold and windy weather from March and February lasted through the middle of the month, with an average daytime high temperature of 15°F and average low temperature of 5°F from 4/1-4/11. Then spring made a dramatic appearance, with a 4-day storm event leaving 2-5’ of snow at upper elevations between 4/11 and 4/15. Things really started getting interesting immediately following the storm, as skies cleared and temperatures rose into the 40’s and 50’s F at ridgetops. This abrupt transition to warm springtime weather immediately following a major storm event resulted in widespread natural activity, including storm slabs, wind slabs, wet slabs, dry loose, wet loose, and glide avalanches reported across the advisory area between 4/15 and 4/22. By the end of the month, the snowpack had settled into a springtime freeze/thaw cycle and avalanche activity subsided while corn harvesting was plentiful!

Evolution of the spring shed cycle on the south-facing slopes on Tincan Ridge.

Glide avalanche near the Seattle Ridge up track.
04.18.2021
Finances and Fundraising - Friends of the CNFAIC

**Thank you, Friends!** The CNFAIC is funded over 50% by the backcountry recreation community. Established in 2003, our nonprofit partner Friends of the CNFAIC works together with the US Forest Service to bridge the gap between federal funds and the actual expenses of operating the avalanche center. **Volunteers and generous donations are essential to funding the forecast!** When our website users, local businesses, and partners give to Friends of the CNFAIC, those dollars help save lives in Southcentral Alaska. We truly appreciate and rely heavily upon this community support.

Donations to Friends of the CNFAIC support avalanche forecasters’ salaries and equipment, as well as maintenance of our website and network of weather stations. It’s easy to donate online, through Pick.Click.Give., and employee giving programs, by purchasing memberships and raffle tickets, or by joining us at fundraiser events.

### CNFAIC Total Operating Budget

- **FS Volunteer hours:** $12,000
- **FS (vehicles, office, in-kind):** $13,580
- **Friends (Equipment, Weather Stations, In-kind):** $52,000
- **FS (forecaster salaries):** $65,000
- **Friends Volunteer hours:** $35,000
- **Friends (forecaster salaries):** $47,250

*Friends of the CNFAIC is instrumental to our operation as they provide over half of our total annual budget!*

**Note** the combined $47,000 value of volunteer time!

**Friends of the CNFAIC Also:**
- Owns and maintains **7 weather stations** throughout many of Southcentral Alaska’s most popular recreation areas from Lost Lake to Turnagain Pass, Glen Alps, Arctic Valley, and Hatcher Pass.
- Awarded **4 educational scholarships** for beginner to advanced avalanche safety training.
- Engaged **1,000+ community supporters** at virtual events like Snow Stories III.
Friends of the CNFAIC (Continued)

Industry sponsorships are instrumental in supporting CNFAIC products and programs. The following are Friends of the CNFAIC Platinum and Gold Level Sponsors of 2020/2021. Thank you to all our Sponsors!

**Platinum Level Sponsors (over $5,000)**

![](Image1)

**Gold Level Sponsors ($1,000 - $4,999)**

![](Image2)

**Gold Level Sponsors ($250 - $999)**

![](Image3)
THANK YOU from the CNFAIC Team!!

The forecasters would like to thank everyone who has extended such incredible support to the Avalanche Center. This service would not be possible without such a strong community desire to make it happen. Have a great summer everyone and we look forward to seeing you next fall!!

Until next season!
Thank you to Paul Wunnicke for this photo of Andrew skinning into the winter sun.