

**EASTERN SIERRA
AVALANCHE CENTER**

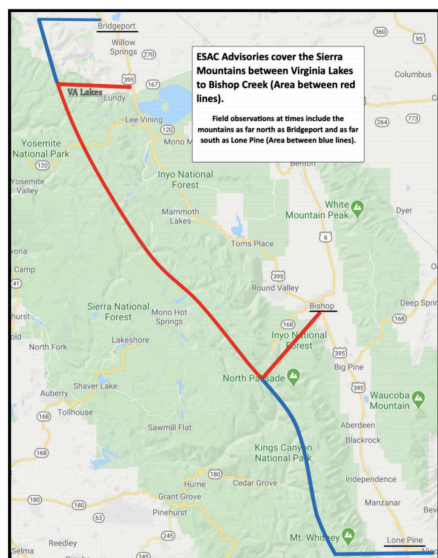
2022-2023 Annual Report

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ESAC Operations

The 2022/2023 season marked the 17th year of operations for the Eastern Sierra Avalanche Center. ESAC is an independent non-profit avalanche forecasting center led by 7 Board of Directors and 4 staff. ESAC has grown immensely over the years and big strides were made this season. Recent milestones include increased staffing, expanded duration of daily avalanche advisories, web enhancements, consistent social media presence, and an expansion of interagency cooperation.



Forecast Region

The Eastern Sierra Avalanche Center covers a 70-mile stretch of California's Eastern Sierra Nevada from Virginia Lakes in the north to the mountains outside of Bishop in the south. This large forecast zone is divided by watersheds into ten distinct regions that make up over 1,000 square miles of skiable terrain. While ESAC's advisories do not officially extend beyond these boundaries, observations often are shared on the ESAC website from as far south as Mt. Whitney and as far north as Bridgeport.

The People of ESAC

Board of Directors

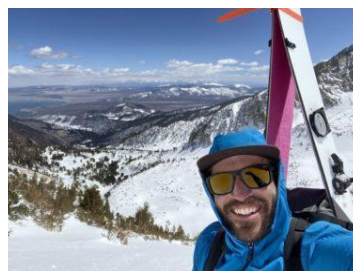
The Board of Directors is composed of dedicated volunteers who oversee the overall policy and direction of the center. Sharing a common passion for promoting safe backcountry travel through the Eastern Sierra, each board member brings unique expertise and perspective to the table. It has been through their tireless efforts that ESAC has blossomed into the center we are today. For the 2022/2023 Season, the Board had seven members including:

- Nate Greenburg - President
- Forrest Cross - Vice President
- Ann Logan - Treasurer
- Neil Satterfield - Treasurer
- Michelle Mather - Director
- Gabe Taylor - Director
- Allan Pietrasanta - Director

At the start of the season, the Board said farewell to outgoing Board members Howie Schwartz and McKenzie Long. ESAC thanks them for their contributions and years of service!

Staff

For the 2022/2023 season, ESAC made significant changes to the staffing structure. Steve Mace took on the role of Center Director and Lead Forecaster, overseeing the responsibility for managing day-to-day operations. Clancy Nelson and Everett Phillips joined the ESAC team as Avalanche Forecasters, bringing a high level of professionalism to the organization. ESAC's Administrative Manager, Rachel Drattler, worked to continue improving the center's financial stability and consistent community presence.



Steve Mace: Center Director/Lead Forecaster

Steve grew up in Golden, Colorado, where he learned to ski at quite a young age. He began to venture outside the gates in his mid-teens and never looked back.

While attending college in Durango, he continued to push his skills and knowledge, earning his turns in the San Juan Mountains. He has skied across the globe, from Japan to the Himalayas, where he helped start a ski school in Gulmarg, Kashmir. Before joining ESAC in 2018, Steve worked as a ski guide in the Wallowa Mountains of eastern Oregon as well as a member of the Snow Safety department at Mt. Hood Meadows. When Steve isn't skiing, he spends his time guiding raft trips on the Colorado River through the Grand Canyon.



Clancy Nelson: Forecaster

Clancy grew up in Mammoth with skis on his feet. His experience with snow safety started in 2007 as a professional ski patroller for Mammoth Mountain Ski Area. He spent 9 years as an observer for ESAC before starting his forecasting career in 2016. Clancy

spent 4 years in Montana worrying about deep slabs and surface hoar for the Flathead Avalanche Center before happily returning home to the East Side and ESAC. His academic background is in environmental science. He has a Level 3 avalanche certification from AIARE, and he's a professional member of the American Avalanche Association. He is an AIARE course instructor and has training from the AMGA in the ski, alpine, and rock disciplines. Clancy prefers to get around on skis, but if it's too warm and dry, you can find him chasing his partner and dog around the mountains in running or climbing shoes.



Everett Phillips: Forecaster

Everett has worked in the avalanche safety field for over a decade. He was lucky to get his start as a ski patroller at Crystal Mountain in Washington, where he discovered backcountry skiing and avalanche science. He has continued to develop those interests professionally as a ski patroller, park ranger, backcountry ski guide, and avalanche educator in

California, Washington, and Colorado. Prior to working at ESAC, Everett led AIARE courses and guided backcountry skiing at Colorado Mountain School. Multi-day ski traverses are his favorite way to spend time in the mountains, especially if there are huts along the way. On his days off, Everett enjoys skiing with his wife Alexa.



Rachel Drattler: Administrative Manager

Rachel spent her early years in the Northeast until she moved to California after graduating college to pursue her passion for climbing. With a degree in Human Ecology, Rachel has dabbled in numerous industries and traveled extensively throughout the U.S. and abroad in

pursuit of remote climbing and skiing adventures. After years of instructing wilderness expeditions for Outward Bound California and Boulder Outdoor Survival School, Rachel has settled into the Eastern Sierra, where she now crunches numbers, sends lots of emails, drinks coffee, and calls June Lake "home."

Website and Social Media

Advisories

The Center's website (www.esavalanche.org) is the primary vehicle for disseminating avalanche advisories. These advisories are composed of a map showing the forecast area color-coded with the day's avalanche hazard rating, the bottom line, a detailed avalanche problem section that includes the likelihood and expected size of certain kinds of avalanches along with travel advice, the weather forecast, an in-depth discussion, and links to recent field observations.

The 2022–2023 season began in early November, with over 60" of snow accumulating in the first 10 days of the month. This early season coverage was enough for the backcountry community to get out for their first turns of the season, and ESAC published a total of 12 Snowpack Summaries during the month of November. The first in a series of atmospheric river events that would become the norm during the season entered the region in late November, bringing heavy mountain snow showers to the forecast area. With adequate snow coverage, ESAC was able to start daily operations much earlier than we ever had in the past. The first daily advisory was issued on December 3rd and continued until May 1st, when the center completed its operations for the season. In total, **146 daily avalanche advisories were issued** with the following danger ratings: 27 days of High, 31 days of Considerable, 67 days of Moderate, and 21 days of Low. In addition to these daily advisories, we issued 12 avalanche warnings and 10 avalanche watches.

Observation Page:

The Observation page is one of the most valuable components of the website. This is where forecasters and members of the public can share point-specific snowpack, weather, and avalanche observations. With only three paid forecasters, volunteer observations play a critical role in developing high-quality avalanche advisories for such a large and variable forecast area. These observations are also visible to the public and help the backcountry community key into specific problems and conditions in different regions within the forecast area.

Observations

We record observed avalanches as quickly as possible, but **DO NOT** assume a lack of reported avalanches means that no avalanches occur avalanche activity due to poor visibility, and we may not record observed avalanches immediately due to our workload.

2021-22 Season All Regions

Avalanches Observed? Signs of Instability?

Showing 1 to 50 of 324 observations

Obs Date	Observer	Region	Location	Avalanches?
April 14, 2022	Key Observer	Mammoth Lakes	The Devil's in the Details	
April 12, 2022	Public	Bridgeport	Matterhorn	
April 10, 2022	Public	Mammoth Lakes	Mammoth Pass and Horseshoe Trees	
April 10, 2022	Key Observer	Mammoth Lakes	Horseshoe Lake Weather Observations	
April 9, 2022	Key Observer	Mammoth Lakes	Sherwin Ridge - Weather Observations and Snow Coverage	

Education:

This page contains a plethora of useful online avalanche education resources, information on local avalanche course providers, and in-depth discussions on how to use the features of ESAC's website.

Online Avalanche Education Resources



CONTINUE YOUR AVALANCHE EDUCATION

AVALANCHE AWARENESS & ONLINE AVALANCHE EDUCATION PROGRAMS

[Know Before You Go](#)

[National Avalanche Center Online Avalanche Safety Tutorial](#)

[AIARE Online Rec 1](#)

[AIARE Online Rec 2](#)

Weather Sensor Application:

This powerful feature allows any user to easily compare remote weather station data from a dozen different stations across our range in graphical or tabular formats. The user can choose to view a specific weather variable such as precipitation amounts, wind speed, direction, or temperature and compare these values through any time and date range that they select.



Website Analytics

- The ESAC website had 260,587 user sessions this season, a dramatic increase from last year's 100,000.
- Total users also increased this season to 153,300, a significant increase from last year's 56,776 user sessions.
- The average session duration decreased slightly this season to 00:01:44 from 00:01:58 last season.

Social Media

In addition to posting information on the website, ESAC leverages social media, including Facebook (@easternsierraavalanchecenter) and Instagram (@esavalanche), to provide timely updates and critical information while connecting more broadly with the backcountry community. Educational videos, avalanche advisories, notable field observations, avalanche incidents, and significant condition updates were pushed regularly to ESAC's social media channels. Community engagement with these posts provided an opportunity for healthy conversation and increased public awareness. ESAC recognizes the value of social media in communicating with our user base, and a significant effort was made to increase the quality and consistency of social posts this season. This effort was particularly effective on Instagram, where we saw significant growth in the number of our followers, views, and engagement.

Facebook: 6,500 followers this season, up from 6,023 followers last year.

Instagram: 16.9K followers this season, up from 10,700 followers last year and 8,051 during the 2020/2021 season.

NOAA/National Weather Service Avalanche Warnings

This was the 5th season that the National Weather Service (NWS) offices in Reno and Las Vegas issued Avalanche Warnings for the backcountry mountains in ESAC's forecast zone. These warnings are issued at the direction of ESAC's forecasting staff when widespread HIGH or EXTREME avalanche hazard is forecasted. The NWS then publishes these warnings through various channels, including local radio stations and online platforms, to heighten the public's awareness of dangerous avalanche conditions. For the 2022/2023 season, ESAC began issuing avalanche watches. An avalanche watch is issued in advance of a warning when a Dangerous avalanche hazard is expected to develop in the near future. Issuing an avalanche watch allows for more advance notice to concerned parties and can be a valuable planning tool for the community. This collaborative effort between the NWS, the National Avalanche Center, and ESAC began during the 2018/2019 season. ESAC issued 12 Avalanche Warnings and 10 Avalanche Watches during the 2022/2023 season. Special thanks to Reno weather forecaster, Zach Tolby, for his extra efforts in making this warning system a reality for ESAC.

Public Observation Network

The Eastern Sierra encompasses a vast amount of mountainous terrain with a very low density of backcountry users compared to other mountainous areas. Getting reliable information on localized weather and the state of the snowpack can be a challenge, and for this reason, ESAC relies heavily on observations from others to develop avalanche advisories. ESAC continues to work on ways to encourage industry professionals and recreationists to submit their snowpack, weather, and avalanche observations. One incentive available to all public observers, thanks to Mammoth Mountaineering Supply and Sage to Summit, is \$5 in-store credit to each observer for every observation they submit through the ESAC website. ESAC appreciates the generous donations of these local retailers.

ESAC introduced our Key Observer program during the 2019/2020 season. This program has proven to be invaluable. This select group of local mountain guides, ski patrollers, avalanche educators, and experienced recreationists are committed to submitting consistent, high-quality observations throughout the season. Together our Key observers submitted **106** observations through the website. We would like to offer our immense gratitude to all of our Key observers for their hard work and commitment to information sharing. Geoff Unger, Ryan Huetter, and Barbara Wanner all went above and beyond this season, offering valuable and timely information via the ESAC website and performing well above our expectations.



Key Observer Ryan Huetter collecting snowpit data.

Over **568** Snowpack and Avalanche observations were submitted through the ESAC website during the operational period this season. Of these observations, **403** were submitted by **176** different individuals in the ESAC public observer network, and **165** observations were submitted by the three paid forecasters.

Special thank you to all Observers!

ESAC would like to recognize the following individuals for submitting at least 3 observations to the website this season. Those who submitted at least **10** observations appear in **bold**, and those who submitted more than **15** appear with an asterisk*. We would like to thank everyone who continues to post their observations; we could not do what we do without you!

- Geoff Unger *
- Ryan Huetter *
- Barbara Wanner*
- Carson Reid*
- Dennis L*
- Alex Lombardo
- Nick Lozica
- Jacob Lipman
- Sascha Von Meier
- Aaron Jones
- Mike Galgay
- Anouk Erni
- Forrest Smith
- Molly Massena
- Bob Harrington
- Jan Czyzewski
- Alex Fruehsamer
- Jeff Montgomery
- Jorel Allegro
- Joshua Sprague
- Matt Duniho
- Rick Ianniello
- Tim De Visser
- Caleb Llop
- Kelly Mull
- Kyle Bradfield
- Michael O'Conner
- Mike Bizinski
- Nico Buxbaum
- Thomas Brudo

We would also like to offer our sincere gratitude to the Mammoth Mountain Ski Patrol's Weather program (Scott Quirsfeld, Neil Satterfield, and Michael Philips) and June Mountain Ski Patrol's Kelly Miller and Doug Johnson, who share their respective early morning avalanche control work results. Also, a special thank you goes out to the local guide companies who encourage their guides to share their field observations and professional snowpack assessments with ESAC as well.

Events: Education & Outreach

ESAC continues to organize events throughout the winter to support our mission of informing and educating the public on avalanche conditions in the Eastern Sierra. ESAC is also committed to maintaining relationships with local agencies and governments who conduct operations within avalanche terrain to support their safe operations. ESAC events were available in person and virtually to accommodate COVID-19 Safety Precautions.

Community Education

ESAC began the season on December 3, 2022, with the annual Kick-Off Event and fundraiser. The event began with the Eastern Sierra Avalanche Workshops in the Village at Mammoth. These workshops consisted of seven presentations by notable avalanche industry professionals throughout the Western U.S. Thank you to the following folks for their presentations.

- Chris Smallcomb, NWS Reno
- Kelly McKeil Ph.D, Eastern Oregon University, Wallowa Avalanche Center
- Alex Marienthal, Gallatin National Forest Avalanche Center
- Gabrielle Antonioli, Bridger Teton Avalanche Center
- Mike Philips, Mammoth Mountain Ski Patrol
- Clancy Nelson, Eastern Sierra Avalanche Center
- Steve Mace, Eastern Sierra Avalanche Center

The event continued at the Tri-County Fairgrounds in Bishop with our keynote speaker, Jeremy Jones, big mountain snowboarder, environmentalist, entrepreneur, and author. The event also featured a book signing of his new publication, “The Art of Shralpinism”.

Throughout the winter season, ESAC staff facilitated the Avalanche Awareness Evening Series throughout the Eastern

Sierra. This was a series of avalanche education events and snowpack history updates that occurred once a month, from December through March. Many thanks go out to Mammoth Brewing Company, Mountain Rambler Brewery in Bishop, and the T-Bar Social Club in June Lake for hosting these avalanche education events.

Agency Education

On December 16, 2022, ESAC hosted our annual Interagency Roundtable Event in Mammoth Lakes featuring presentations from various local agency representatives and ESAC Avalanche Forecasters.

As the 2022/2023 season progressed and the snow accumulation and avalanche hazard grew, ESAC forecasters worked with local emergency services, industry partners, contractor crews, and community organizations to provide targeted season history updates and avalanche awareness presentations. This outreach proved beneficial for crews working in avalanche terrain while working to restore power and access to isolated communities. In addition, ESAC forecasters provided daily avalanche briefings to the emergency management teams in Mono and Inyo counties during the State of Emergency in late February and early March.

Outreach

This spring, ESAC staff worked with Mammoth Mountain and Mammoth Mountaineering Supply to help set up the Caldera Burn Skimo race and set up a table at the event to offer information and inform folks about ESAC services.

ESAC supports continuing avalanche education on all levels. ESAC Forecasters contributed to local avalanche courses by sharing information about avalanche forecasting in the Eastern Sierra and the Snowpack season history to date.



Financial Summary

Expenses \$155,086

Income \$156,604



Promotion \$9,066 Overhead \$18,540 Operations \$127,480

General Donations \$43,038 Grants \$93,000 Fundraising \$20,566

Financial Supporters

ESAC is extremely grateful for the individuals, businesses, foundations, and agencies that have contributed to ESAC this season. Without financial support, we could not provide avalanche forecasting services. ESAC would like to recognize the following:

Key Supporters

\$5k+ cash or \$10k+ in-kind or a combination



Light speed



MAMMOTH LAKES RECREATION



EDISON INTERNATIONAL



Mammoth Lakes

Roussev Foundation

Sustaining Supporter

\$2,500–\$4,999 cash or \$5k in-kind or a combination



**S. Livingston Mather
Charitable Trust**



Select Supporter

\$1k–\$2,499 cash or \$2,500 in-kind or a combination



Supporter

\$500–\$999 cash or \$1,500 in-kind or a combination



**County of Inyo
Sheriff's
Department**

Sarah Thompson



Eben Freeman

**Lucky Seven
Foundation**

Erik Wright

Brian Harvey

Local Businesses and Industry Supporters of Events

ESAC has become known for events with abundant raffle prizes and impressive silent auctions. We would like to extend a huge thank you to the following organizations and individuals for the generous support of ESAC and for making this possible:

Aly Vanko	Indy Coffee Roasting	Owens Valley Distillery
Arcade Belts	International Alpine Guides	Patagonia
Black Tie	Jake's Family Maple Syrup	Profiles' Salon
Blazing Shears	John's Pizza Works and Outlaw Saloon	Ridge Merino
Bluesapalooza	Jones Snowboards	Roberto's
Burgers	June Lake Brewing	Sage to Summit
Cary Clark, L.A.c	Lenny & Larry's	Sierra Mountain Center
Chris Benchetler	Lesley Byberg	Sierra Mountain Guides
Christian VanVeen	Liberty Bar	Sierra Mountaineering International
Claude Fiddler	Lisa Mather, CMT	Sierra Spine & Wellness
Dan Dixon/Level 8	Loony Bean Bishop	Skadi
Designs Unlimited	Mammoth Chevron	Spark R & D
Devil's Creek Distillery	Mammoth Fun Shop	Stellar Brew
Dynafit	Mammoth Mountaineering Supply	Surefoot
Eastern Sierra Green Business Program	Mike Gable, DPT	Tarah Garcia
Eastside Sports	MMSA	Tera Kaia
Elixir	Mountaineers Books	Tom's Place Resort
Footloose	Muhka	Wave Rave
Giovanni's Pizzeria	Nancy Fiddler	Wilder & Beyond
Great Basin Bakery		

Looking Forward / Future Improvements

ESAC will continue to improve operations and produce high-quality information for the public. Heading into the 2023-2024 season, we anticipate a continued increase in backcountry travel in the Eastern Sierra. The center is committed to continuing to produce high-quality avalanche advisories seven days a week to keep the public informed of avalanche conditions. ESAC will focus on the following areas this upcoming season:

- **Staffing:** ESAC has grown considerably over the past few years. Over the years, our operating budget has grown substantially and our user base has continued to grow. The 2022/2023 season marked the 5th season ESAC has operated as a type 1 center issuing daily avalanche forecasts. While these have been positive changes, this has also come with more substantial workloads. For the 2023/2024 season, we hope to expand staffing by bringing in a 4th full-time forecaster. On the condition that funding is secured for this position, we hope to make this hiring in the late summer.
- **Outreach and Education:** ESAC is committed to continue providing educational events to residents and visitors of Inyo and Mono Counties and continues seeking out expansion of our public engagement. In the future, we hope to increase event attendance through community outreach as well as by utilizing social media. We have also identified a need to expand our reach to the motorized backcountry community in the Eastern Sierra and are committed to expanding this outreach.
- **Social Media:** During the 2022/2023 season, ESAC focused efforts on utilizing social media in a more effective and consistent way. As a result, we saw an explosion in our following, specifically on Instagram. With the ever-increasing and changing use of social media products, ESAC will continue to leverage these platforms to communicate with the public. We recognize the power of these platforms for disseminating information and are excited to explore new ways to share pertinent field observations and educational content, as well as encourage backcountry users to visit the website for the forecast.
- **Fundraising and Grants:** Rachel Drattler joined ESAC for the 2020/2021 season as our Administrative Manager.

Over the past three seasons, Rachel has managed ESAC's grant programs and increased the center's ability to identify and procure funding. The center plans to continue to maintain current funding streams as well as explore new avenues of funding to help ESAC maintain financial stability long into the future.

- **Strengthening ties with local and regional agencies:** During the record winter snowfall, ESAC worked closely with local and regional agencies. The center's goal is to continue to foster these close working relations with Southern California Edison, Cal-Trans, California Highway Patrol, Inyo and Mono Counties Sheriff Departments, LA Department of Water & Power, the National Park Service, and US Forest Service. Existing partnerships with Mammoth and June Mountain Ski Areas have proven critical to the Center's success, and we hope to continue and strengthen these relationships.
- **Beacon Basin & Beacon Checkers:** For many seasons, ESAC has partnered with Mammoth Mountain to offer a Beacon Basin free to the public to practice their transceiver search skills. After technical difficulties in the past, ESAC and Mammoth Mountain Ski Patrol have collaborated to implement a new Beacon Training Park at Mammoth Mountain Ski Area for the 2023/2024 season in addition to installing new Beacon Checkers at the resort boundary at the top of both Mammoth and June Mountains.
- **Weather Stations:** There are numerous weather stations located throughout the ESAC forecast area. Remote weather stations are an integral part of producing accurate avalanche forecasts. Installing additional ridgetop wind sensors and making existing snow depth sensors operational again for next winter would be valuable by increasing the accuracy of our forecasting

Detailed Season History

Winter 2022-2023 was the biggest snow year on record in the Sierra Nevada. Precipitation conditions in the Eastern Sierra exceeded the April 1st normal by 305%, and average temperatures were the coldest recorded in approximately 30 years. The snowpack and weather this winter created unusual avalanche stability patterns for the Eastern Sierra, including three extended persistent slab problems following the December, February, and late March persistent weak layer formations. This record winter also resulted in unprecedented infrastructure damage in local communities. Stretches of the main highway (CA Route 395) were closed by avalanche debris for weeks. Unshoveled roofs collapsed, buried propane tanks exploded, and avalanches damaged structures in stranded mountain communities. During this turbulent season, ESAC published daily forecasts from December 3rd through April 30th and made marked improvements in avalanche

center professionalism, public engagement, interagency cooperation, and product quality, accuracy, and consistency. Winter 2022-2023 was the 17th operational season for ESAC, and the 5th season ESAC issued daily forecasts as a Type 1 avalanche center.

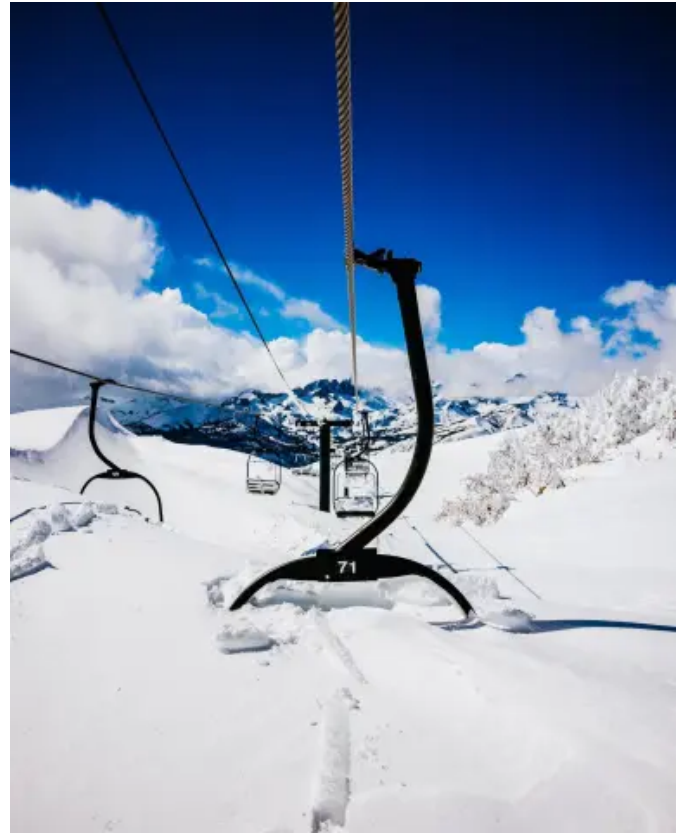


Photo from Mammoth Mountain March 2023.

Our region received the first significant snowfall of the winter on November 5th. The event delivered 5.59 inches of snow water equivalent (SWE), began as rain, and ended as snow, leaving a basal rain crust covered by 48.5 inches of low-density snow. The rest of November was unusually cold, with monthly temperatures ranging from 1 to 8 degrees below average. Field data collection on the shallow early-season snowpack found ubiquitous, persistent weak layers (PWL), including facets around the November rain crust, faceted snow throughout the lower and mid-pack, and combinations of near surface facets and thin temperature crusts at the snow surface. This foreshadowed the increasingly complex snowpack and the historic season of 2022-2023.

Snowfall resumed in earnest on December 1st, 2022, and 25.5 inches of new snow fell by the morning of December 3rd. With this storm, ESAC began daily forecasting operations - the earliest to date in the center's history - with High danger at all elevations. Early-season storms set up a continental-like snowpack. The persistent slab problem associated with the December 1st PWL produced natural avalanche cycles with

each consecutive storm from the beginning of December through mid-January. Avalanche activity on this layer peaked in the period between December 26th and January 17th as one of the strongest and most intense strings of atmospheric rivers (AR) on record in the Sierra Nevada. During this storm cycle, 252.5 inches of snow and 43.64" of SWE accumulated at Sesame. Multiple large and very large natural avalanches were recorded throughout the forecast area. A good example of avalanche activity during this time occurred on January 10 during the second strongest event of the period, when a natural avalanche destroyed one and damaged two unoccupied buildings in the town of Aspendell. This avalanche released when hard, wind-deposited snow failed and stepped down to persistent grains near the ground. The crown was 6 to 8 feet deep and 443 feet wide. The strong early season led to good coverage in the tracks and runouts of avalanche paths which connected lower-elevation start zones with infrastructure, including roads and buildings, for the remainder of the winter.



Natural avalanche that occurred on January 10, 2023 above Aspendell. This avalanche damaged three houses.

From the second half of January to the last week of February, the forecast area experienced an extended period of dry weather and generally stable conditions. With a now deep snowpack and little additional stress, weak layers in the lower snowpack gained strength. Once again, however, the clear weather was accompanied by temperatures significantly below average, and the cumulative effect began to weaken the upper snowpack. In early February, light snowfall and intermittent wind events began to produce small avalanches where wind-deposited snow failed on layers of small-grained facets at the snow surface. These avalanches became indicators of a developing problem. Faceting in the upper snowpack progressed through the end of the month, by which point we consistently observed 1 to 1.5 mm faceted grains at the surface or buried under shallow wind slabs on most aspects at all elevations. When the Pacific stormtrack returned to our region, we introduced our second persistent slab problem of the winter.

In 22 days between February 22nd and March 15th, a series of AR events brought in approximately 18 feet of snow and 24 inches of SWE. We forecasted high danger on nine different days in that time period, and we issued four separate avalanche warnings. Mono and Inyo Counties declared a state of emergency due to extreme snowfall and subsequent flooding concerns. With each round of loading, the February PWL continued to produce very large avalanches.



Large natural wind slab avalanche. Released on the morning of 2/26/23 on a NE aspect at 8700'.

The first round of large and very large avalanches was observed during a short window of clear skies on the morning of Feb. 26th after approximately 5 inches of SWE. Included in this set of avalanches was a near miss when a solo skier remotely triggered a D3 failing on the buried PWL. The window closed that afternoon as winds ramped up ahead of the next AR event and brought on a natural avalanche cycle that blocked Highway 395 north of the town of Lee Vining. It would not re-open for another 26 days due to sustained avalanche hazard, infrastructure damage, and continued accumulation of avalanche debris.

When skies cleared again on March 2nd after four days and 5.3" SWE, historic avalanches connecting multiple start zones were visible on mountainsides up and down Highway 395. Intermittent storms and new snow instabilities continued until the February PWL's final crescendo came during a series of heavy storms between March 9th and March 15th which delivered 11 inches of SWE. This round of heavy loading was accompanied by rising snow levels, each pulse beginning with snow levels up to 9000' (start zones within the ESAC area range from 6,000' to 13,500'). Deep, persistent slab avalanches up to D4 in size released in the still-dry February PWL near and above treeline and then entrained wet snow in lower elevation tracks and runouts. Two such avalanches crossed the already-closed section of Highway 395 near Mono Lake. The highest concentration of notable avalanche activity occurred in the southern half of the forecast area, including

several slides that damaged county roads and ran well beyond the snowline.



Crown of a deep persistent slab D3 avalanche on a N aspect on McGee Mountain on 3/13/23.

The final avalanche associated with the February PWL likely occurred on March 20th when a large natural wind slab avalanche on the east face of Mt. Wood stepped down into the old snow. By this time, the February PWL was buried over 7 feet deep and continually produced avalanches bigger than D3 for three weeks. During late March, Mammoth Mountain surpassed previous records for snow accumulation as they surpassed 700" of snowfall.

Two short periods of cold, clear weather in late March were enough to form near-surface facets and crust-facet combos on SE, E, and NE aspects, which created our final persistent slab problem. While never producing an avalanche larger than D2, this persistent slab problem was responsible for more human-triggered avalanches than the previous two cycles combined. The snowpack remained sensitive to human triggering into the first week of April.

With a winter snowpack still in play, ESAC extended daily forecasts until the end of April, two weeks past the previously

scheduled end of operations. The first significant spring warm-up led to a significant cycle of wet loose avalanches in the second week of April. The snowpack continued to transition, and the discussion shifted to hazards related to wet snow instability using a spring-diurnal mindset. With multiple buried weak layers, warming temperatures, and a record-breaking snowpack driving noticeable glide crack formation, the forecast team was focused on the potential for wet slab and glide avalanche activity. These hazards did not materialize until the final day of the operational season when, on April 29th, a skier-triggered a wet loose avalanche on Mono Jim Peak that stepped down to a D2 wet slab. This avalanche was followed by the first reported release of a glide avalanche (D2.5) on the adjacent avalanche path on May 3rd.



Wet slab avalanche on east aspect on Mono Jim. Skier triggered and stepped down. 4/29/23

While ESAC's operational season wrapped up at the end of April, winter recreationists continued to venture into the backcountry well into the summer months. A handful of avalanche incidents occurred in the months following the end of the forecast, including two fatalities in the Eastern Sierra (Hurd Peak and Split Mountain).

This historic winter and backcountry ski season that extended well into the summer months highlighted that avalanche hazards often continue beyond the operational season, and we at ESAC recognize that this can be a challenge for backcountry users. ESAC is currently employing two staff members year-round as of 2023. Though this will not be enough to continue a daily avalanche forecast into the late spring and early summer, this increased staffing will allow for continued staff presence, website management, general avalanche information updates, and incident investigation. In addition, the observations portal will continue to stay open into the summer for the public to submit and utilize for timely information.