



MOUNT SHASTA AVALANCHE CENTER

Annual Report 2020.21



ANNUAL REPORT 2020.2021



The Mount Shasta Avalanche Center just finished its 23rd season of operation. The 2020-21 winter was characterized by well below-average precipitation. As of December 1st, precipitation was 23% of normal for the wet season. A winter storm on Christmas Day got us back in the game with 14 inches of snow and began an active wet weather pattern that lasted through the



first week of January. Then on January 22nd, a series of major storms began impacting the area bringing around 45 inches of snow over a 12-day period, much of which fell at low elevations. Though we would receive regular precipitation events through the end of March, the series of January 22nd storms brought us the majority of snow for the season. Extended gale force wind events after these storms left the upper regions of Mount Shasta devoid of snow. Lack of snow in late

March and April have not improved the situation. Climbing routes on the south and west sides of the mountain have become dangerous to ascend. At season end (April 11th), we have re-

ceived 47% of normal precipitation in the city of Mount Shasta. There is currently 64 inches of snow near treeline.

There was not significant avalanche activity overall this season, though there was one avalanche fatality just outside our forecast area near Etna Summit. On February 3rd, an experienced snowboarder and skier triggered a (D2) wind slab avalanche as they were transitioning to ride down. Both riders were caught, one was completely buried and pinned against a tree. Though the rescuer was able to dig and recover his friend and perform CPR, the buried individual did not survive.

For the 5th season in a row, the MSAC had 3 full time employees. Nick Meyers returned for his 12th season as director, forecaster, and ranger, Aaron Beverly worked his 5th season as a professional observer and forecaster, and Ryan Sorenson worked his 3rd season as an avalanche forecaster and ranger. The USFS funds Nick and Ryan's salaries, while the Friends of the Mount Shasta Avalanche Center (FMSAC) funds Aaron's.

Last fall, through an OHV grant from the State of California and funding from FMSAC, the six weather stations maintained and used by MSAC forecasters had their components upgraded, pre-programmed, and installed. These new components have allowed more control over the operation of the stations, are more supportable, and are more reliable. And as a side benefit, the technical knowledge needed to maintain the stations are now in-house.



December 23th, 2020



April 8th, 2021

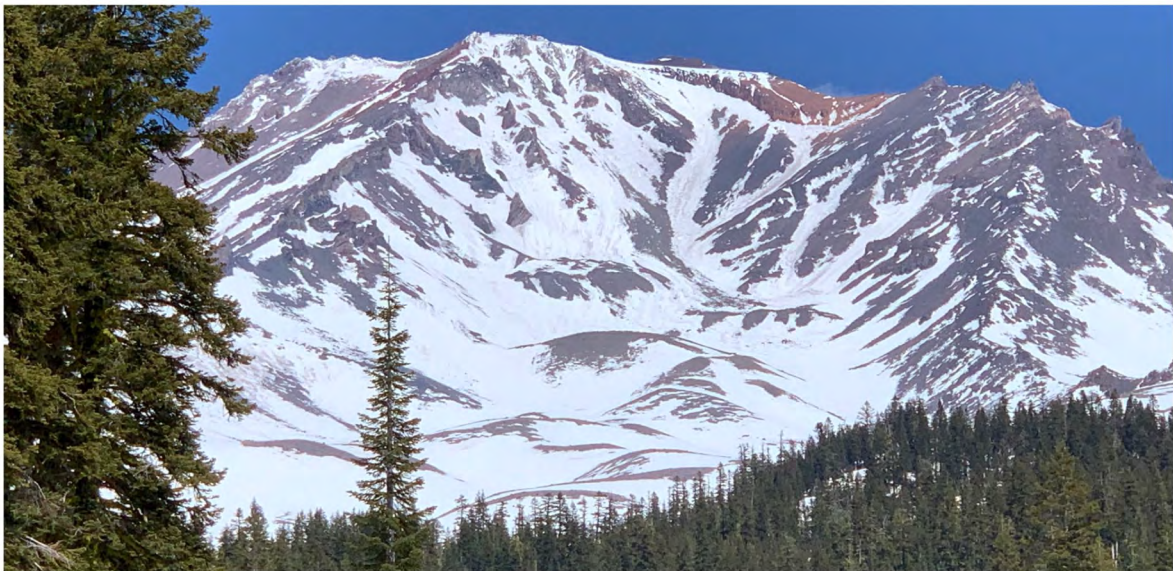
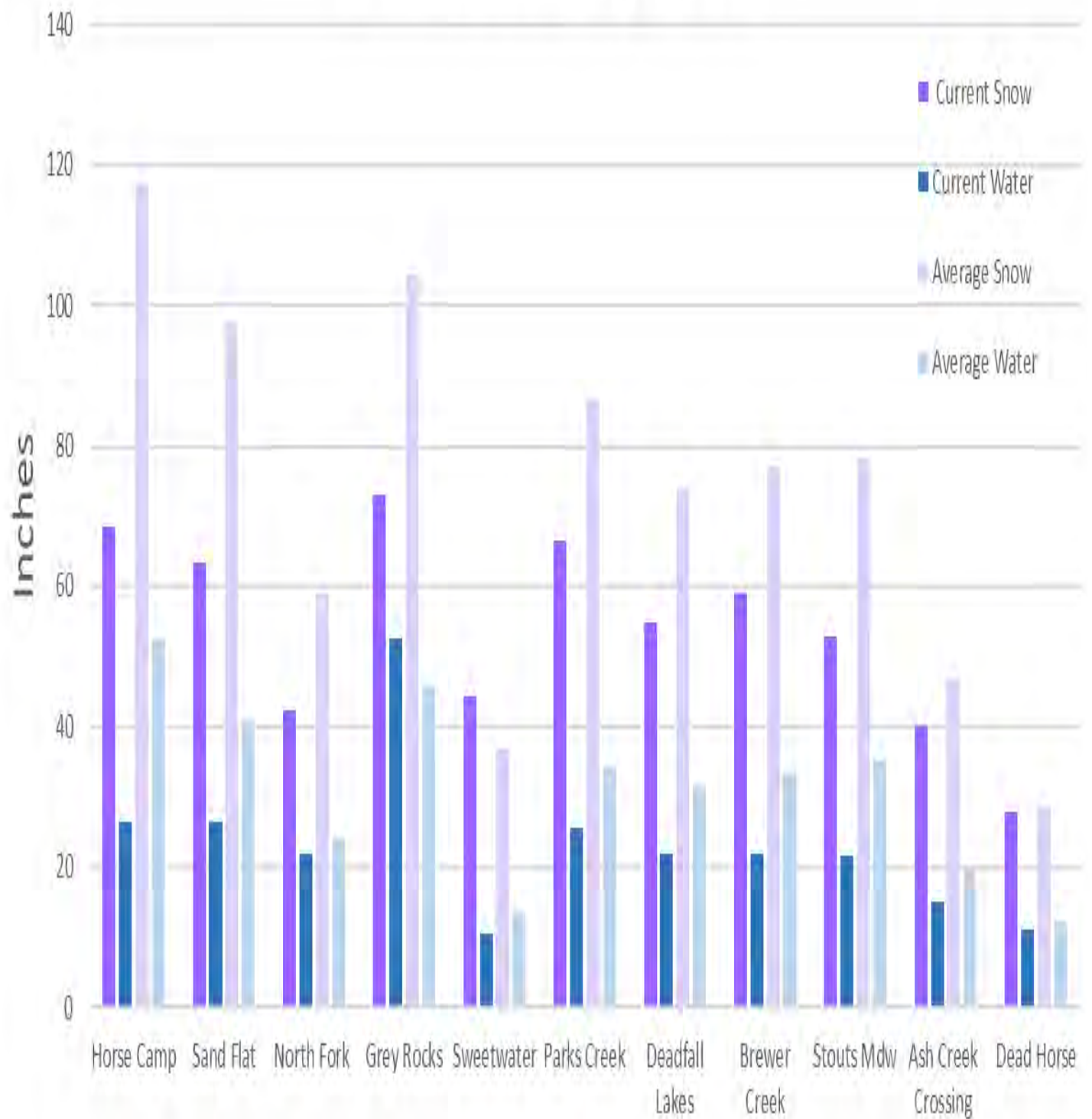


Photo comparison from the beginning and end of the 2020/2021 winter season. While Mount Shasta would turn white during storms, incessant northwesterly wind and wind from other directions would erode the above treeline snowpack all winter long. For the days after a storm, you could watch the snow disappear before your eyes.

Mt. Shasta Area Snow Survey - April 2021



April 15, 2021

MT. SHASTA AREA SNOW SURVEY RESULTS – APRIL 2021

Sacramento, Shasta and Trinity Watersheds*

Course	Elevation(ft)	Last Month Snow(in)	2021 Snow(in)	2021 Water(in)	2020 Snow(in)	2020 Water(in)	Hist. Average Snow(in)	Hist. Average Water(in)
Horse Camp	7900	61	68.5	26.5	69	22.5	117.44	52.5
Sand Flat	6800	63	63.5	26.5	57	24	97.84	40.72
North Fork	6900	NS	42.5	22	28	7	59.28	24.08
Grey Rocks	6200	NS	73	52.5	57	21.5	104.33	45.71
Sweetwater	5850	43.5	44.5	10.5	13.5	5	37.11	13.53
Parks Creek	6700	64	68.5	25.5	37	14	86.57	34.49
Deadfall Lakes	7200	45	55	22	45	15.5	73.87	31.57

	2021 Snow(in)	2021 Water(in)	2020 Snow(in)	2020 Water(in)	Hist. Average Snow(in)	Hist. Average Water(in)
Averages of Courses Sampled	59	26.5	44	15.6	82.3	34.7

Percent (%) of Historic Average	72	76	53	45
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N/S = Not Sampled

McCloud Watershed*

Course	Elevation(ft)	Last Month Snow(in)	2021 Snow(in)	2021 Water(in)	2020 Snow(in)	2020 Water(in)	Hist. Average Snow(in)	Hist. Average Water(in)
Brewer Creek	6250	53.5	59	22	39	16.5	76.97	33.56
Scouts Meadow	5400	50	53	21.5	NS	NS	78.1	35.4
Ash Creek Crossing	5000	NS	40	15	0	0	46.8	19.8
Dead Horse Canyon	4900	NS	28	11	0	0	28.82	12.35

	2021 Snow(in)	2021 Water(in)	2020 Snow(in)	2020 Water(in)	Hist. Average Snow(in)	Hist. Average Water(in)
Averages of Courses Sampled	45	17.4	13.0	5.5	57.7	25.3

Percent (%) of Historic Average	78	69	23	22
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N/S = Not Sampled

By the numbers: Website/Social Media/Email

The MSAC website experienced steady use this season. For the 2020-21 winter (December 1st, 2020 - April 11th, 2021), www.shastaavalanche.org received 96,038 total visits, of which 37,305 were unique users. The average session duration was 2 minutes and 34 seconds. Of website visitors, 22% were returning while 78% were new.

Website

- 2020-21 Number of MSAC Avalanche Advisories: 135
- Number of Unique Website Users: 37,305 (+37%)
- Total Number of Website Visits: 96,038 (+28%)
- Mobile Users: 20,437
- Average Session Duration: 2 minutes 34 seconds

Social Media / Email

- Number of Facebook Followers: 5,546 (+17%)
- Number of Instagram Followers: 2,326 (+22%)
- Number of Advisory Email Subscribers: 218 (+12%)
- Time of Day of Visits: 7 a.m.



Education

- Number of People Reached: 400
- Number of Avalanche Presentations Delivered: 18

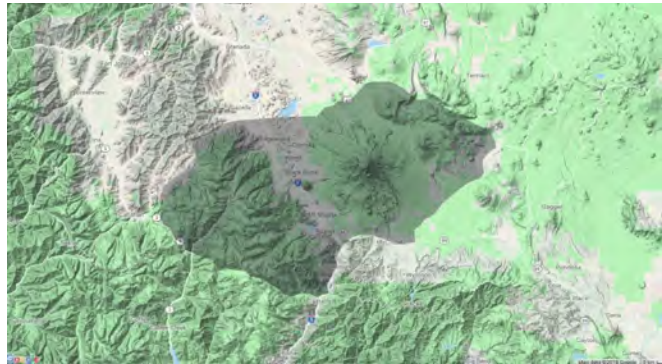
Avalanches 2019-20 Season

- Number of National Avalanche Fatalities: 36
- Number of Fatalities in the MSAC Forecast Area: 1 (outside of area, but near)
- Number of people caught in avalanches in the MSAC Forecast Area: 2

Avalanche Forecasts

The primary goal of the MSAC staff is to communicate current avalanche, snowpack and mountain weather information through our avalanche forecasts. The 2020-21 season was the fifth year in a row we were able to issue daily forecasts. A total of 132 *advisories* were published between December 1, 2020 and April 11, 2021 on our website www.shastaavalanche.org.

MSAC's 800 square mile forecast area



In order to convey the most accurate message to the public, it is critical to get out into the backcountry regularly to gather current information on conditions. Days begin early for us to be able to publish the advisory by 7 a.m. and are followed by field outings on skis and snowmobiles in our 800 square mile forecast area. Forecasters are also responsible for local trailhead maintenance, cleaning and snow removal as well as snow ranger/law enforcement/patrol duties.



A standard snowmobile tour in the Old Ski Bowl, 10,000 feet, with Green Butte Ridge to the right. Conditions in the bowl remained rocky like this throughout the winter.

Avalanche Danger Ratings 2020-21 Season

Overall Ava-lanche Dan-ger Rating	LOW	MODERATE	CONSIDERABLE	HIGH	EXTREME
Number of Days Issued	87	22	19	3	1

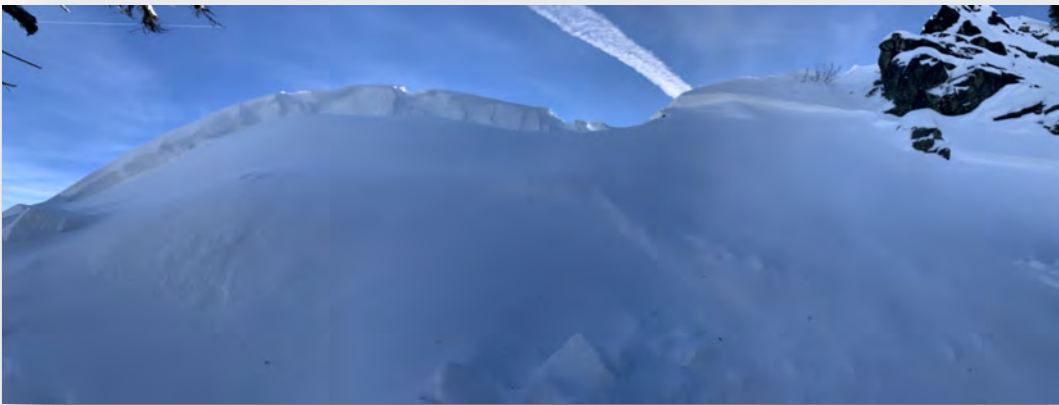


MSAC forecasters out in the field for observations and testing of the snowpack stability.



Avalanche Incidents

Though there were some small avalanches throughout the season, one occurred that was notable. It occurred near Etna Summit, which is outside our forecast area, but was close enough to be relevant. On February 3rd an experienced snowboarder and skier triggered a large (D2) wind slab avalanche as they were transitioning to ride down. The crown was 70 feet wide and 2 feet thick and the slab slid 200 feet. Both riders were caught, one was completely buried and pinned against a tree. The rescuer's beacon malfunctioned, but he was able to locate his friend near his ski pole and unbury him within 30 minutes. CPR was performed but the buried individual did not survive.



The February 3rd Etna Pass fatality avalanche that claimed the life of Brook Golling, 35, of Ashland, Oregon



The Etna Pass incident terrain where the fatality occurred.



Castle Lake, skier triggered wind slab on March 11th. Nobody was caught.

Snowpack, Weather and Avalanche Summary

The 2020-21 winter was characterized by below-average precipitation and a lot of wind. Though the wet season officially starts in October, conditions were dry all fall. As of our first avalanche forecast on December 1st, precipitation was 23% of normal.

A winter storm on Christmas Day got us back in the game with 14 inches of snow and began an active wet weather pattern that lasted through the first week of January. Despite some moderate gains in precipitation, we were still only a dismal 31% of normal.

Then on January 22nd, a series of major storms began impacting the area bringing around 45 inches of snow over a 12 day period, much of which fell at low elevations. Because the existing snowpack prior to these storms was firm and icy, and due to the sheer amount of snow expected, we raised avalanche danger to extreme for the first time in MSAC's history. Despite all indicators that natural avalanches were certain, we did not observe any significant avalanches after the storms cleared. But our numbers had improved: 55% of normal.

Though we would receive regular precipitation events through the end of March, the series of January 22nd storms brought us the majority of snow for the season. Extended gale force wind events after these storms left the upper regions of Mount Shasta devoid of snow. We have received no precipitation in April. As of April 11th and our last published forecast, most routes of the mountain are not considered safe to climb due to the lack of snow and rockfall on the popular routes.

From December 1, 2020 through April 11th 2021:

- The Old Ski Bowl on Mount Shasta received 159 inches of snow.
- The maximum snowfall in 24 hours was 22 inches.
- The total snow water equivalent (SWE) measured was 16.8 inches.
- The maximum average wind recorded was 65 mi/hr and the maximum wind gust was 98.
- Temperatures have averaged 30 °F.
- The minimum and maximum recorded were 7 °F and 56.5 °F, respectively.
- The current snow depth near treeline is 64 inches.
- We are currently at 47% of normal precipitation.

Northwest wind was a common theme throughout the winter, as seen here sublimating snow into the atmosphere off exposed ridgelines.



Small wind slabs on leeward slopes like this one were common this year, but we did not see many large avalanches.





Avalanche Education

The Mount Shasta Avalanche center delivered 18 avalanche presentations this season reaching 400 people throughout northern California and southern Oregon. MSAC provided free KNOW BEFORE YOU GO (KBYG) avalanche awareness and companion rescue clinics the first Friday and Saturday of December, January, February, and March. KBYG avalanche awareness was conducted through online Zoom meetings and companion rescue clinics were conducted at Bunny Flat using facemasks and social distancing standards for COVID-19 precautions. Training was also given to 7 Siskiyou County school groups, a Boy Scout troop, and USFS Klamath National Forest snow survey crews.

Date	Speaker	Group/Topic	Participants
12/4/20	Meyers/Glaubman	Monthly Avalanche Awareness	43
12/5/20	Meyers/Sorenson/ Glaubman	Monthly Companion Rescue	11
1/1/21	Meyers	Monthly Avalanche Awareness	13
1/2/21	Glaubman/ Sorenson	Monthly Companion Rescue	24
1/4/21	Glaubman	Boy Scout Troop - Roseville Avalanche Awareness	20
1/8/21	Meyers	Snowmobile Avalanche Awareness	2
1/9/21	Meyers/Sorenson/ Glaubman	Snowmobile Companion Rescue	2
1/15/21	Meyers	Dunsmuir Elementary Snow School	22
1/19/21	Beverly	Sisson Elementary Snow School	15
1/19/21	Sorenson/ Glaubman	Klamath National Forest Avalanche Awareness	10
2/5/21	Meyers/Glaubman	Monthly Avalanche Awareness	43
2/6/21	Sorenson/ Glaubman	Monthly Rescue Clinic	26
2/24/21	Beverly/Glaubman	Castle Rock School Snow School	12
3/4/21	Glaubman	Delphic Elementary	11
3/5/21	Meyers/Glaubman	Monthly Avalanche Awareness	27
3/11/21	Meyers	School Group Companion Rescue	20
3/16/21	Beverly	Gazelle Elementary	20
3/31/21	Meyers/Glaubman	Sebastopol High Mind of a Scientist	80



Finances of the MSAC

The Shasta Trinity National Forest funded 38% of the MSAC’s total operating costs for the 2020-21 season. The MSAC was awarded a CA state OHV grant (other agency cash) that provided 26% of the total cost for this season, and the FMSAC funded 34%.

Shasta Trinity National Forest Service cash	\$45,349
Shasta Trinity National Forest Service in-kind	\$6,170
Other Agency Cash	\$35,250
Other Agency in-kind	\$0
Non-Profit / Friends Cash	\$42,056.76
Non-Profit / Friends in-kind	\$4,016.44

Total: \$132,842.20



Friends of the Mt. Shasta Avalanche Center

The Friends group is a nonprofit that was created in 2002, and is an essential component of the Avalanche Center. FMSAC funds Aaron Beverly's position as a Forecaster and Professional Observer. The Friends fund and operate the MSAC website and all of our remote weather stations. They also organize all fundraising events, and help with the education and outreach components of the avalanche center.

FMSAC is a volunteer group with one paid position, the Executive Director, Casey Glaubman. FMSAC board members include Hanne Meyers, Sean Malee, Dave Brown, Jason Koster, Nick Joslin, and Clayton Coles.

The group represents the soul of adventure and passion for backcountry mountain recreation in the greater Mount Shasta area. We extend a huge thank you for all of their effort and support this season.

Casey Glaubman, Director



Casey Glaubman, the man with many hats. Casey is stoked to join as director and education coordinator of the Friends of the Mount Shasta Avalanche Center for the 2020-21 season. A few interesting facts about Casey include his dream to own a sushi truck. He completed the Mount Shasta top to bottom ski challenge, that is, sans tops and bottoms. A naked summit to Bunny lap! His only allergy is orange dye, which makes his ears turn red. And from what we understand, he is working on becoming a mobile notary. Casey is a real freestyle individual with a drive to lead, inspire and educate.

Hanne Meyers, President



Hanne Meyers, our fearless president of the Friends of the Mount Shasta Avalanche Center is as local as they come. Born and raised in the Mt. Shasta alpine community, Hanne has snow and skiing in her blood. She became involved with the MSAC in 2012 as another outlet for her passion for skiing and to give back to the community that has provided so much for her and her family. In 2015, she stepped up to the president position after a large turnover in the FMSAC Board of Directors. Hanne has established a career with the US Forest Service as a Fuels Specialist and spends her summer months planning and implementing fire and fuels reductions projects in the greater Mt Shasta area. She still manages to find plenty of time during the year to play and coordinate FMSAC events and activities. Hanne's seemingly limitless energy and commitment are enviable. All adventures Hanne is game for: skiing, climbing, surfing and whatever other adventure her husband Nick has cooked up, she is right there and in good form.

Sean Malee, Vice-President, Director



Dr. Sean Malee, vice-president of the MSAC board, has been referred to as our "tribal elder", and for good reason. He grew up along the banks of the Trinity River, and has continued to call the north state his home. When he is not at the hospital advancing his medical career he is outside slaying it somewhere. Countless adventures on vertical rock walls, steep alpine faces, narrow single track trails, and churning white water rapids have equipped Sean with the knowledge to advise and guide his fellow outdoor thrill junkies. He has been a crucial member of the FMSAC board of directors since almost the beginning, and is a born leader with always a solid opinion.

Clayton Coles, Secretary



Clayton Coles joined the FMSAC board of directors during the 2018/2019 winter season after volunteering for our events for several years. Clayton is an engineering geologist and has been in the far north state community for over 30 years. He represents the southern Cascade contingent of the Board, splitting his backcountry time between Mount Shasta and Mount Lassen.

Jason Koster, Treasurer



Jason Koster first arrived in Mount Shasta from the East Coast (NY) in 2002 and has been an enthusiastic member of the backcountry ski community since. He is often sighted with his two amazing sidekicks, daughters Angelina and Sophia, or working as a Physical Therapist assisting his fellow community members get back out and shred. His persistent jones finds him searching for pow, climbing high, shredding single track, or carving up waves. Jason's support and zest are a welcome addition to the FMSAC Board.

Nick Joslin, Director



Nick is a recent addition to the FMSAC board of directors, but has been a longtime local to area. After graduating from the University of Oregon, Nick made his way out to the San Juan Range in Southwest Colorado where he jumped right into backcountry skiing. The San Juan's have a notoriously dangerous snow pack and offered Nick a crash course in backcountry skier safety. Needless to say, he was pleased to return to the wetter and more predictable snow pack of the West Coast. He is a valuable addition to the FMSAC board, and we're stoked to have his support.

Dave Brown, Director



Dave Brown joined the Friends of the Mount Shasta Avalanche Center during the 2015/2016 winter season. His addition to the ranks of the FMSAC board has reconnected the avalanche center with the Mount Shasta Ski Park ski patrol. Not only does Dave's participation realign the MSAC and ski patrol in spirit, it has also allowed for greater ease in sharing of snow pack observations between the two. Dave's experience and wisdom has been a welcome addition.



Weather Stations

MSAC maintains six weather stations within its coverage area - Castle Lake, Mount Eddy, Gray Butte, Old Ski Bowl, Ash Creek Butte, and Ash Creek Bowl. These stations are important in providing data to inform our daily avalanche forecasts. They provide data such as temperature, relative humidity, snow depth, snow water equivalent, wind speed, wind direction, wind gusts, and wind chill.



The Old Ski Bowl weather station has historically drawn power from a 3rd party operating out of a radio equipment bunker nearby. MSAC made the long term decision this year to become independent of this 3rd party and provide its own power source. Through a cooperative effort with electricians, Pacific Power, forecasters, and volunteers, ditches were dug, conduit was laid, wires were pulled and connected, and power provided.

The components within these stations have become antiquated and manufacturers have been reluctant to provide support for them. Through an OHV grant from the State of California, money was provided to replace the old with the new. Data-loggers, radios, and modems were all replaced with the latest technology. All components were reprogrammed, rewired, and reconfigured to bring the weather stations up-to-date and functioning on the highest level. As a side benefit, the technical knowledge required to maintain these components moved in house, decreasing the need to hire outside contractors to debug malfunctioning stations.



Sponsors

Alpenglow Manor	Alua's Thrive Bar	Bekka Rosenbaum
Bridget Shaw Design & Fine Art	Cafe Maddalena	California Ski Guides
Cheryl Powell	Donna & Brock Meyers	Garmin
Gary Welbourn	Giant Loop	GoPro
Honig Vineyard & Winery	Intuition Liners	Jacklily Floral
Jody Glaubman	Judi Davis	Julbo
Just Tunes / Vinnie Poch	Kari Traa	Kim Coots
Kokatat	Kuhl	Leif Whittaker
Montanaro Vineyards	Mount Shasta Yoga Center	Mountain Provisions
Native Grounds / Garden Tap	Northbound Coffee Roasters	Northwest Nature Shop
O'Reilly Auto Parts	Petals Flower Shop	Pipeline
Point S	Rab	Raven Tree
reBalance Pilates Studio	Redding Sports LTD	Richard Glaubman
Rogue Ski Shop	Sacred Mountain Spa	Scarpa
Shasta Woolies	Siskiyou Muffler	Siskiyou Outdoor Recreation Alliance
Spark R&D	Sundial Collective	Sweet Trinity Guide Service
Wanda Welbourn	Wild Waters Fly Fishing	

Shasta Sponsors



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Summit Sponsors



Reported by:

Nick Meyers

Director/Lead Avalanche Forecaster

Aaron Beverly

Avalanche Forecaster

Ryan Sorenson

Avalanche Forecaster

204 West Alma Street, Mount Shasta, CA 96067
shastaavalanche@gmail.com / 530-926-9613

Additional Photos



A nice lenticular cloud atop Mt. Shasta, view of the north side. Lenticular clouds are a sign of high wind, which we had plenty of.



A skier tops out at Helen Lake this past winter with overhead wind formations looming.



A forecaster's day off somewhere in the Eddy Mountains



One of our bigger dumps of the season on January 27th, the compound showing some signs of avalanches!



**High wind toppled healthy trees
this winter and left our snow-
pack in a state of disrepair .**





Mt Shasta Avalanche Center student intern Zach Koball out near Castle Spire. Zach spent numerous days out with MSAC forecasters learning all about snow, avalanche and weather information.





Avalanche Center employees and volunteers conduct snow survey measurements for the Department of Water Resources, California each month.

Thank You!

