# 2019-20 Annual Report



# Shasta/Trinity National Forest MOUNT SHASTA AVALANCHE CENTER





#### **Sponsors**



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

Cover: Mount Shasta's Eastside viewed from Ash Creek Butte

# **Mount Shasta Avalanche Center**

#### Season Summary



The Forest Service Mount Shasta Avalanche Center just finished its 22<sup>nd</sup> season of operation. The 2019-20 winter was characterized by below-average precipitation. February, with only 0.12 inches of water recorded, was the driest on record, the prior record being set in 1971 with 0.21 inches. Though we made some gains in late March and early April, they did not provide the miracle needed to get us back on track. Overall, during the wet season (October-April) Mount Shasta City received 17.17 inches of water which is 47% of the historic average of 36.68 inches. Snow surveys completed in April also reveal that the region's snowpack heights are near half the historical average and contain 45% of the water content.

For the 4<sup>th</sup> season in a row, the MSAC had 3 full-time employees. Nick Meyers returned for his 11<sup>th</sup> season as director, forecaster, and ranger, Aaron Beverly worked his 4<sup>th</sup> season as a professional observer and forecaster, and Ryan Sorenson worked his 2<sup>nd</sup> season as an avalanche forecaster and ranger. The USFS funds the forecasters' salaries, while the Friends of the Mount Shasta Avalanche funds the professional observer's salary.

Avalanches were not a common occurrence this season due to below-average precipitation. We recorded 11 avalanches within our forecast area. Considerable avalanche danger was issued 7% and moderate was issued 31% of this season's avalanche forecasts. The MSAC is happy to report that no one was injured or killed in an avalanche in our forecast area during the 2019-20 winter.

# **Statistics**



#### Sacramento, Shasta and Trinity Watersheds\*

Course	Elevation(ft)	Last Month Snow(in)	2020 Snow(in)	2020 Water(in)	2019 Snow(in)	2019 Water(in)	Hist. Average Snow(in)	Hist. Average Water(in)
Horse Camp	7900	60.6	69	22.5	145.6	61.6	118.1	52.8
Sand Flat	6800	49.8	57	24	153	54.5	98.31	40.9
North Fork	6900	N∕S	26	7	111.6	42	59.47	24.16
Grey Rocks	6200	N∕S	57	21.5	N/S	N/S	104.8	45.62
Sweetwater	5850	20.4	13.5	5	68.4	24.2	37.02	13.57
Parks Creek	6700	47.5	37	14	109.6	38.6	86.83	34.61
Deadfall Lakes	7200	41.5	45	15.5	117	-	74.14	31.76
			2020 Snow(in)	2020 Water(in)	2019 Snow(in)	2019 Water(in)	Hist. Average Snow(in)	Hist. Average Water(in)
Averages of Courses Sampled			44	15.6	117.5	44.2	82.7	34.8
Percent (%) of Historic Average			53	45	142	127		

#### Website/Social Media/Email

The MSAC website experienced steady use this season. For the 2019-20 winter, www.shastaavalanche.org received 75,199 total visits, of which 27,969 were unique users. The average session duration was 2 minutes and 28 seconds. Of website visitors, 24% were returning while 76% were new.

2019-20 Number of MSAC Avalanche Advisories: 135 Number of Unique Website Users: 27,969 (+22%) Total Number of Website Visits: 75,199 (+17%) Mobile Users: 16,854 Average Session Duration: 2 minutes 28 seconds Number of Facebook Followers: 5,546 (+31%) Number of Instagram Followers: 2,326 (+315%) Number of Advisory Email Subscribers: 194 (+64%) Time of Day of Visits: 7 a.m. Education Number of People Reached: 181 Number of Avalanche Presentations Delivered: 15 Avalanches 2019-20 Season Number of National Avalanche Fatalities: 21 Number of Fatalities in the MSAC Advisory Area: 0 Number of people caught in avalanches in the MSAC Advisory Area: 1

# Avalanche Forecasts

The primary goal of the MSAC staff is to communicate current avalanche, snowpack and mountain weather information through our avalanche forecasts. The 2019-20 season was the fourth year in a row we were able to issue daily advisories. A total of 135 advisories were published between November 30, 2019 and April 12, 2020 on our website www.shastaavalanche.org. **MSAC's 800 Square Mile Advisory 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 advisory area

#### Avalanche Danger Ratings 2019-20 Season

Overall Ava- lanche Dan- ger Rating	LOW	MODERATE	CONSIDERABLE	HIGH	EXTREME
Number of Days Issued	83	42	9	1	0

#### Avalanche Incidents

Fortunately, no avalanche fatalities occurred in our advisory area during the 2019-20 season, though one partial burial was reported. The snowboarder in this incident was not injured. In the U.S., there were 22 avalanche fatalities this winter which is below the national average of 27.

Avalanches were not a common occurrence in our forecast area this season due to below aver-age precipitation. We recorded 11 avalanches. Of these, five were large enough to bury or kill a person (D2) and one was large enough to bury a car (D3). The D3 avalanche occurred on the east facing aspect of Casaval Ridge after a wind event deposited new storm snow along the ridge. The wind slab that released was ½ mile long and deposited snow up to 10 feet deep in the gully below. Avalanche Gulch and Gray Butte produced the majority of observed avalanches.



12/21/19 - SS-N-R1-D1.5 Natural wind slab avalanche on Green Butte



1/16/20 - SS-AC-R1-D2 cornice triggered storm slab avalanche on Gray Butte



03/29/20 - WS-ASu-R1-D1.5 skiertriggered avalanche on Gray Butte



04/05/20 - SS-ASu-R1-D1.5 skiertriggered avalanche on Gray Butte East Ridge





04/05/05 - HS-N-R2-D3-S Natural wind slab avalanche on Casaval Ridge 04/05/05 - SS-ASu-R2-D2 skiertriggered and partial burial near Scott Mountain

### Avalanche Education

The Mount Shasta Avalanche center delivered 15 avalanche presentations this season reaching 181 people throughout northern California and southern Oregon. The MSAC provided free avalanche awareness and companion rescue clinics the first Friday and Saturday of December, January, February, and March. These clinics were held in the Shasta Mountain Guides' storefront and at Bunny Flat trailhead and were open to the public. A training was also given to 15 elementary and middle school kids at the Northern United Charter School. There were two internal Forest Service employee avalanche awareness and companion rescue workshops.



12/11/19 - Northern United Charter School Avalanche Awareness



1/4/20 - Bunny Flat Companion Rescue Clinic

Date	Speaker	Group/Topic	Participants
12/6/19	Meyers	Mount Shasta Avalanche Awareness	8
12/7/19	Meyers/Sorenson	Mount Shasta Companion Rescue	4
12/11/19	Sorenson/Beverly	Northern United Charter School Ava- lanche Awareness	15
12/18/19	Meyers	Medford REI Avalanche Awareness	20
1/3/20	Meyers	Mount Shasta Avalanche Awareness	30
1/4/20	Meyers/Sorenson	Mount Shasta Companion Rescue	22
2/7/20	Meyers	Mount Shasta Avalanche Awareness	17
2/8/20	Meyers/Sorenson	Mount Shasta Companion Rescue	22
2/12/20	Sorenson	Avalanche Awareness Scott River Rang- er Station	10
2/20/20	Beverly	MSAC Snowmobile Avalanche Work- shop	20
2/26/20	Sorenson	USFS Fire/Snow Survey Avalanche Awareness	4
3/6/20	Sorenson	Mount Shasta Avalanche Awareness	1
3/7/20	Meyers/Sorenson	Mount Shasta Companion Rescue	2
3/13/20	Beverly	Avalanche Awareness for WHS Biology	6

# Finances of the MSAC

The Shasta Trinity National Forest funded 52% of the MSAC's total operating costs for the 2019-20 season. The MSAC was awarded a CA state OHV grant (other agency cash) that provided 31% of the total cost for this season, and the FMSAC funded 17%.

Shasta Trinity National Forest Service cash	\$47 <i>,</i> 353
Shasta Trinity National Forest Service in-kind	\$5 <i>,</i> 800
Other Agency Cash	\$32,800
Friends of the Mount Shasta Avalanche Center cash	\$17,862.53

Total - \$103,815.53

# Friends of the 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 the 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, Justi Hansen. FMSAC members include Hanne Meyers, Sean Malee, Stacia Anderson, Dave Brown, Jason Coster, Molly Breitmun, Nick Joslin, Clayton Coles, Bill Gellor and Nate Parker.

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.



12/03/2019 - FMSAC North State Giving Tuesday Party

01/18/2020 - FMSAC working it at the 18th Annual SNOW BALL



01/18/2020 - 18th Annual SNOW BALL and 7<sup>th</sup> Annual Shasta Ascension Race



# Snowpack, Weather and Avalanche Summary

The wet season began just before Thanksgiving when a bomb cyclone blasted in from the north bringing 22 inches of snow and shutting down highways to holiday travelers. This barely made a dent in the numbers set by a dry autumn and we started our season at 31% of normal precipitation. Several storms came to the area in December, the biggest one from 12/5-12/8, which brought close to 5 inches of precipitable water. Unfortunately warm temperatures kept this mostly as rain below 6,000 ft. A stout ice crust formed from this wet layer near and above treeline and persisted for quite some time. By the end of December, Mount Shasta had received 89 inches of snow, but hosted a snowpack that was only 44 inches deep. We had improved our numbers, though, and were at 60% of normal precipitation (8.93 inches measured, 14.96 inches normal). Avalanche danger was reported as moderate for 14 days and considerable for 2 days.



12/31/2019 Rain crust still existed at the snow surface.

12/23/19, heading up toward the Old Ski Bowl, near treeline.

Regular storms continued to come in January and cold temperatures brought their precipitation as snow to lower elevations. The relatively shallow snowpack, crust layers and cold temperatures led to a persistent weak layer forming in the upper snowpack. This is somewhat unusual for our climate and led to some lively discussions and in depth snowpack analysis. No avalanches occurred on this layer that we know of. At the end of January, the season total for snowfall was 152 inches and the snowpack depth was 69 inches. No gains in our numbers were achieved - 58% of normal precipitation (12.78 inches measured, 22.06 inches normal). The avalanche danger was reported as moderate for 13 days, considerable and high for 1 day each.



Old Ski Bowl - 1/10/2020 and 1/26/2020 - Regular storms continued to bring fresh snow to Mount Shasta in January.

The faucet turned off at the end of January and we received virtually no precipitation (0.12 inches) throughout February. It was the driest February ever recorded. The last record was hit in 1971 at 0.21 inches. Avalanche danger remained low throughout the month.

Things turned back on in March, though we received no miracle. By the end of the month, snowfall totals increased by 42 inches to 197. The snowpack depth was 83 inches. Precipitation amounts dropped to 43% of normal (15.03 inches measured, 35.33 normal). Avalanche danger was reported as moderate for 10 days and as considerable for 2 days.



3/16/2020 - A wintery storm in midmarch brought light density, deep snow.

Early April brought an unusually cold storm that produced 2 inches of precipitable water and 22 inches of snow. Snow levels dropped below 3,000 ft. This storm and wind events during and shortly after led to several skier-triggered and natural avalanches occurring, including the largest avalanche of the season which slid into Avalanche Gulch off the east side of Casaval Ridge.

Overall, from November 26, 2019 though April 12th 2020, the Old Ski Bowl on Mount Shasta received 220 inches of snow. The maximum snowfall in 24 hours was 22 inches. The snow water equivalent (SWE) measured was 21.28 inches. The maximum average wind recorded was 56 mi/ hr and the maximum wind gust was 80. Temperatures have averaged 29 °F. The minimum and maximum recorded were 6.5 °F and 55 °F, respectively. We are currently at 47% of normal precipitation.



The MSAC installed a beacon checker at the base of Gray Butte. This location is a popular portal for backcountry ski access via the Mount Shasta Ski Park.



The MSAC received a California State OHV grant that allowed the purchase of all new weather station telemetry upgrades. This spring, all five weather stations will be upgraded with the latest and greatest!





# THANK YOU!