

# 2016-17 Annual Report



## Shasta/Trinity National Forest MOUNT SHASTA AVALANCHE CENTER



## Sponsors



## **Reported by:**

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*Cover: Natural Avalanche on Casaval Ridge/Photo: Eric Rideout*

# Mount Shasta Avalanche Center

## *Season Summary*



The US Forest Service Mount Shasta Avalanche Center just finished its 19<sup>th</sup> season of operation. The region experienced one of the wettest winters on record, with Mount Shasta City receiving 56.81 inches of water between October 1, 2016 and April 17, 2017. Normal precipitation by this time of year is 37.16 inches, which puts Mount Shasta City at 153% of normal. The significant statewide precipitation received this winter season ended California's five-year drought. Early season snowfall in October laid the foundation for the deep and mostly stable snowpack that consistently grew throughout the winter. Frequent precipitation events occurred December through April, often with snow levels dropping to town at 3500ft.

The MSAC had 3 employees this season, the most number of employees the Avalanche Center has ever had. Nick Meyers returned for his 8<sup>th</sup> season as the Director and Lead Forecaster. Andrew Kiefer filled a USFS position as a second full time Avalanche Forecaster for the Avalanche Center. Aaron Beverly started with the MSAC this season as well, filling a part time Professional Observer position funded by the Friends of the Mount Shasta Avalanche Center.

The Avalanche Center is happy to report that no avalanche fatalities occurred this season within the advisory area. Snowpack stability was quick to improve after storms with wind slab, storm slab, and cornice fall avalanches being the primary concerns. The most notable avalanche of the season occurred naturally on December 17<sup>th</sup> off of Casaval Ridge on Mount Shasta. The size 3 wind slab avalanche put 20-30 feet of debris on Lake Helen, a popular camp for climbers in Avalanche Gulch. It certainly was impressive, and one of the most destructive avalanches that has occurred in Avalanche Gulch in the last 20 years.

The outreach and educational components of the avalanche center kept us busy, and we were able to provide 27 avalanche trainings to a total of 567 people throughout Northern California and Southern Oregon. An additional 708 people were reached through our climbing specific REI presentations in Sacramento and the Bay Area.

The Friends of the Mount Shasta Avalanche Center is essential to our operations, and its members coordinate several events and fundraisers throughout the season including the Backcountry Ascension Race and the Annual Snow Ball. We could not do our work without them, and we extend a huge thank you for their support.

## ***Statistics***

### Website/Social Media

2016-17 Number of MSAC Avalanche Advisories: 137

Total Number of Website Users: 28,836

Total Number of Website Sessions: 74,276

Average Session Duration: 2 minutes 15 seconds

Number of Facebook Followers: 3,699

Number of Instagram Followers: 214

### Education

Number of People Reached: 567

Number of Avalanche Presentations Delivered: 27

### Avalanches 2016-17 Season

Number of National Avalanche Fatalities: 12

Number of Fatalities in the MSAC Advisory Area: 0

Number of people caught in avalanches in the MSAC

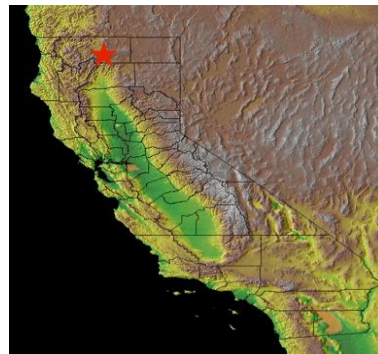
Advisory Area: 3

## Avalanche Advisories



Issuing daily advisories is the MSAC's primary focus throughout the winter. The 2016-17 winter season was the second winter in a row the avalanche center was able to issue daily avalanche advisories. This season, 137 advisories were published on our website, [www.shastaavalanche.org](http://www.shastaavalanche.org), between December 1<sup>st</sup> and April 16<sup>th</sup>.

The advisory area is 60 square miles and encompasses Mount Shasta, the McCloud area east of Mount Shasta, and the Castle Lake/Mount Eddy areas west of I-5.



Beginning December 1<sup>st</sup>, advisories were published daily by 7am in order for recreationalists to be able to check the report before heading out into the backcountry. Mornings began early for us, and were followed by engaging days in the field to gather avalanche, snowpack, and weather observations for the following day's report. By mid December, snow coverage above 4500ft was excellent, and avalanche activity occurred in all zones throughout the advisory area.

The MSAC website experienced noticeable growth in the number of users and page visits this season. The number of website users for the 2016-17 winter was 32,782, an increase of 8,138 users, or 33% growth compared to the 2015-16 season. There were 83,829 website sessions this season, and the average session duration was 2 minutes and 13 seconds. Of website visitors, 62% were returning while 38% were new.

### Avalanche Danger Ratings 2016-17 Season

Overall Avalanche Danger Rating	LOW	MODERATE	CONSIDERABLE	HIGH	EXTREME
Number of Days Issued	29	54	38	16	0



## ***Avalanche Incidents***

Thankfully, there were no avalanche fatalities within the MSAC avalanche advisory area during the 2016-17 season. In the U.S., there were 12 avalanche fatalities this winter, far fewer than the national annual average of 27.

Three skiers were caught in avalanches within our advisory area this season in two separate incidents. The first incident occurred on December 17<sup>th</sup>, the same day a large natural avalanche occurred on Casaval Ridge. That afternoon, two skiers triggered and were caught in an avalanche in Sun Bowl, a popular ski run on the south side of Mount Shasta. The skiers were carried 800 vertical feet, remained on top of the snow surface, and were uninjured. The two people involved were not carrying any rescue gear and were incredibly lucky to have not been buried in the avalanche. The second avalanche incident this season occurred on March 6<sup>th</sup>, on Left Peak in the Castle Lake area. The skier who was caught triggered the avalanche, was carried 100 vertical feet into trees, and was partially buried but uninjured.

## ***Avalanche Education***

The Mount Shasta Avalanche Center delivered 27 avalanche presentations reaching 567 people throughout northern California and southern Oregon this season. The MSAC provided four basic avalanche awareness and companion rescue clinics, free of charge to the public, on the first Friday and Saturday of each month, December through March. There were several internal Forest Service employee avalanche trainings that also focused on basic avalanche awareness and avalanche rescue. A training was given to the Crater Lake National Park Ski Patrol in early December. We were able to reach several local school groups including the Mount Shasta High School Ski Team as well. Finally, similar presentations and clinics were held in Ashland, Oregon and the MSAC held a free, one full day, snowmobile specific avalanche awareness and companion rescue workshop.



<b>Date</b>	<b>Instructor</b>	<b>Group/Topic</b>	<b>Participants</b>
12/3/16	Meyers/Kiefer	Crater Lake Ski Patrol/Rescue and Field Observations	35
12/6/16	Meyers	Medford REI/Avalanche Awareness	28
12/9/16	Meyers/Kiefer	Mount Shasta Public/Avalanche Awareness	30
12/10/16	Meyers/Kiefer/Beverly	Mount Shasta Public/Companion Rescue	32
12/13/16	Kiefer	Mount Shasta High School Ski Team/Avalanche Awareness	30
12/14/16	Beverly	Golden Eagle Charter School/Avalanche Awareness	14
1/6/17	Meyers/Kiefer	Mount Shasta Public/Avalanche Awareness	30
1/7/17	Meyers/Kiefer/Beverly	Mount Shasta Public/ Companion Rescue	15
1/14/17	Meyers/Kiefer	Trinity Snow Survey Crew/Avalanche Awareness and Companion Rescue	8
1/18/17	Beverly	USFS Fort Jones/ Avalanche Awareness	13
1/26/17	Beverly	Medford RCC/Avalanche Awareness	13
1/26/17	Meyers/Kiefer	USFS SMMU/Avalanche Awareness and Companion Rescue	25
2/3/17	Meyers	Mount Shasta Public/ Avalanche Awareness	3
2/4/17	Meyers/Beverly	Mount Shasta Public/ Companion Rescue	4
2/7/17	Meyers	Mount Shasta Rotary Club/ MSAC overview	35
2/11/17	Meyers	Ashland Public/Avalanche Awareness	42
2/12/17	Kiefer/Beverly	Ashland Public/ Companion Rescue	25
2/14/17	Kiefer	USFS SMMU/ Avalanche Awareness	50
2/18/17	Meyers/Kiefer/Beverly	Mount Shasta Snowmobile Specific Training/ Avalanche Awareness and Companion Rescue	10
2/21/17	Kiefer/Beverly	USFS Klamath Snowmobile Training/ Avalanche Awareness and Companion Rescue	15
2/24/17	Beverly	Mount Shasta Nordic Center School Groups/ Avalanche Awareness	20
3/3/17	Meyers	Mount Shasta Public/Avalanche Awareness	15
3/4/17	Beverly	Mount Shasta Public/ Companion Rescue	10
3/10/17	Beverly	Mount Shasta Nordic Center School Groups/ Avalanche Awareness	20
3/16/17	Meyers	Mount Shasta Elementary School/ Avalanche Awareness	20
3/17/17	Beverly	Mount Shasta Nordic Center School Groups/ Avalanche Awareness	20
3/22/17	Kiefer	Redding Boy Scouts/ Avalanche Awareness	15

## ***Finances of the MSAC***

The Shasta Trinity National Forest funded 32% of the MSAC's total operating costs for the 2016-17 season. The MSAC was awarded a CA state OHV grant (other agency cash) that provided 41% of the total cost for this season, and the FMSAC funded 27%.

Shasta Trinity National Forest Service cash	\$23,640
Shasta Trinity National Forest Service in-kind	\$4,728
Other Agency Cash	\$36,245
Friends of the Mount Shasta Avalanche Center Cash	\$12,170
Friends of the Mount Shasta Avalanche Center in-kind	\$11,300
<b>Total - \$88,083</b>	

## ***Friends of the Avalanche Center***

The friends group is a nonprofit that was created in 2002, and is an essential piece of the Avalanche Center. FMSAC funds Aaron Beverly's position as the Professional Observer. The Friends operates 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, Dave Brown, Jason Coster, Nicole Dove, Terra Yaeger, Nick Caselli, Nick Joslin, and Brian McCall.

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.



*On Giving Tuesday, the FMSAC raised \$5,182 dollars! / The Mt Shasta Ascension backcountry ski race*



## ***Snowpack, Weather and Avalanche Summary***

Many areas in California experienced the wettest season on record during the 2016-17 winter. Although we did not break the record books for precipitation here in Mount Shasta, it was certainly a winter to remember. A few large early season storms in mid October laid a solid snowpack foundation in areas 7000ft and above, and made for some of the best early season skiing and riding conditions in years. The winter really turned on by early December, and the advisory area rarely went longer than a week without receiving precipitation all the way through April. The avalanche danger was quick to rise and fall with storm events.



*Photos of the Old Ski Bowl Weather Station at 7600ft on December 9, 2016 and April 14, 2017. By April 16<sup>th</sup>, the Old Ski Bowl was measuring 222 inches of snow on the ground!*

December in Mount Shasta often produces the coldest temperatures and some of the most interesting snowpack layers of the season. That was certainly the case this winter. One of the most impressive avalanches on Mount Shasta in recent history occurred on December 17<sup>th</sup>, two days after a storm deposited 20 inches of snow and 2 inches of SWE in a 48-hour period. A major NW wind event occurred from the 14-17<sup>th</sup> of December, and was very productive in loading SE aspects, especially after precipitation ended. In the early morning hours on the 17<sup>th</sup>, a natural wind slab avalanche occurred off of Casaval Ridge. The avalanche was 1500 feet wide, ran for 2000 feet, and put 20-30 feet of debris on Lake Helen, a popular camp for climbers in Avalanche Gulch.



*December 17<sup>th</sup>, 2016 Casaval Ridge avalanche crown*

That same afternoon, 2 skiers triggered, and were caught in the Sun Bowl avalanche. The MSAC forecasters happened to be in the same area, and were able to respond to the scene of the avalanche within 30 minutes of the 911 call. Upon arrival, we were relieved to find both skiers involved to be uninjured.

On December 23-25, a cold storm brought 1 foot of snow, 1.5 inches of SWE, and snow down to town level. This storm buried the 12/23 snow surface – a layer of near crust facets. This layer was very reactive in stability tests for two weeks, but was isolated in its distribution and never produced an avalanche. A rain on snow event on January 8<sup>th</sup> erased the 12/23 layer completely, and was the final confirmation that our one and only persistent weak layer of the season was no longer a concern.

January brought the largest storm event of the season. For 7 days in a row between the 17<sup>th</sup>-23<sup>rd</sup>, areas 6000ft and above received 7-9 feet of snow. This period also brought the most widespread avalanche cycle of the season with several wind slab and cornice fall avalanches running naturally during the storm. The big January storm brought our height of snow to 3+ meters in areas 6000ft and higher. Mount Shasta City picked up 4-5 feet of snow as well, and exhausted all snow removal efforts for local plows. The storm closed the Everitt Memorial Highway and the

Castle Lake Road for over a month, limiting access to the primary backcountry recreation trailheads in the area.

February was characterized by smaller storms and regular avalanche activity. Several storms came in wet with high freezing levels and significant rain on snow events. One wet storm on February 7<sup>th</sup> added 6 inches of snow to a slick old snow surface. During the tail end of this storm, a natural wet loose avalanche ran and triggered a storm slab avalanche on a steep slope above Castle Lake. The flowing avalanche debris hit Castle Lake and fractured the lake ice.



*Storm slab avalanche on February 7<sup>th</sup>, 2017*



*February 20<sup>th</sup> natural wind slab crown / March 11<sup>th</sup>, natural storm slab in Castle Crags Wilderness {Photo: R.Kohn}*

The snow kept falling in March and April with bursts of sunny spring weather in-between storms. Towards the tail end of the season, avalanche events became far less destructive. Many size 1 avalanches occurred during storms or on very warm sunny days, but there were very few size 2 or larger avalanches in March and April. The corn skiing came in waves, and the powder skiing continued. Coverage on the mountain is looking great and we are gearing up for an amazing climbing season here on Mount Shasta.

Mt. Shasta Area Snow Survey - April 2017

