

# Eastern Sierra Avalanche Center

## Annual Report

### 2010-2011



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## Introduction

Welcome once again to the Eastern Sierra Avalanche Center (ESAC) annual report. We are happy to provide readers with more information on another successful season. The Forest Service ESAC has operated successfully for the last several years through the combined efforts of the Forest Service and the Friends of the Eastern Sierra Avalanche Center (FOESAC) non-profit. Over the lifespan of the ESAC, the Friends of organization has willingly borne the bulk of the funding burden, through fund-raising events and membership drives. FOESAC has also played a key role in setting the strategic vision for the center as a whole.

Sustainability is central to the operation of ESAC and is the biggest challenge facing the center in the face of a changing economic climate. A big success this year was surpassing education goals and developing working relationships with other government agencies while at the same time providing a great product and service to the public. The Forest Service revised and implemented a well-defined operation plan consistent with Forest Service National Avalanche Center guidelines. We hope the federal budget will provide a reasonable expectation of continued funding levels and a commitment to staffing. Towards these ends, FOESAC and the Forest Service will work diligently through the summer and fall to help bring more formality to ESAC operations, chart long-range strategies and make a commitment to our staff for the 2011-2012 season and into the future.

FOESAC upgraded the ESAC website to address a number of concerns raised by the public. Notably, a new volunteer observer program resulted in a dramatic increase in snowpack observations. An observation page was created for the public to post their information.

Significantly, the Forest Service and FOESAC worked to convert our seasonal, temporary forecaster position to a term position; a significant step towards sustainability of the Center. We were fortunate to receive applications from several qualified potential future forecasters, and were able to select a strong candidate. Unfortunately, due to an unfortunate climbing accident the term forecaster was unable to accept the position.

As a result the Center got a later start on the 2010-2011 season than expected and Sue Burak, lead Forest Service forecaster, started work late at the end of December. The FOESAC contracted with Josh Feinberg. Josh graciously agreed to start working at the end of November and worked alone until Sue came on board. The addition of a 2<sup>nd</sup> forecaster improved the Center's ability to back up advisories with more field observations.

The Avalanche Center's education program expanded from a few events during the 2009-2010 season to a well rounded program including presentations in Bridgeport and Lone Pine. ESAC also gave talks to Level 1 AIARE avalanche classes and professional

AIARE guide training courses. ESAC, along with Mono County Search and Rescue organized an avalanche awareness presentation in Mammoth.

ESAC traveled from Bridgeport to Lone Pine giving talks, showing the latest avalanche education movies and was invited to speak to the Bishop Rotary club. An Interagency meeting was also offered and attended by Caltrans, the Mammoth Police Chief, Mono and Inyo County undersheriffs and emergency coordinators.

As a result, avalanche information was shared between the Forest Service and the Lee Vining office of Caltrans. Caltrans road supervisors requested wet snow avalanche danger assessments from the ESAC on two occasions during the Tioga Pass road clearing operations at the end of April and early May.

The avalanche center advisory covers a large area of about 180 square miles. The avalanche center is limited by having adequate staffing to collect snowpack data from the four main watersheds covered by the avalanche advisory. To remedy this situation, ESAC organized an observer program in January. Fourteen people signed up and seven observers posted more than half of the 146 snowpack and avalanche observations displayed on the website. Trip reports from nine Sierra peak ski descents were included on the observation page. The vast majority (90%) of observers collected snowpack information from the colder, north facing aspects. North facing slopes are preferred by skiers because they are more likely to hold dry powder snow.

The avalanche rose made a debut on the ESAC website this year. The avalanche rose, a popular graphical display of avalanche conditions, is utilized by most Forest Service Avalanche Center's to provide a graphical display of the avalanche conditions described in the avalanche advisory. Forest Service avalanche specialists use the avalanche rose to identify elevations and aspects that lack snowpack information and schedule their field work accordingly. A challenge for next season will be to encourage observers to collect snowpack observations on southeast to west facing slopes so all elevations and aspects represented on the avalanche rose can be filled out with substantive data. Also for next year, improvements to the ESCA website will be aimed at adding regional danger ratings for each of the four areas covered by the advisory along with an avalanche rose to describe avalanche conditions.

The FOESAC held a very successful January event. Over 200 people attended the 5th annual Season Kickoff Event, helping FESAC raise over \$7,500! The event was truly amazing - filled with incredible people who were interested in the extreme skiing exploits of Chris Davenport.

Seventy five people attended both of the free daytime seminars offered during the January event, and over 40 people were present for FOESAC Board Member, Howie Schwartz's presentation on Terrain Recognition and Neil Satterfield's avalanche rescue training. Many thanks go to Neil & Howie, both of Sierra Mountain Guides for donating

their time to these daytime events. We hope you all learned something and will continue to expand on your knowledge through more avalanche education.

We couldn't do what we do without the support of our members, and the generous financial support of Mono County, the Town of Mammoth Lakes, Mammoth Mountaineering Supply, The Little-Kittinger Foundation and the Donald M. Slager Sunset Foundation. It's the community support that powers this organization both financially and in spirit.



Sue Burak, ESAC avalanche specialist. Pine Creek avalanche debris, March 22, 2011.

## Season Highlights

- The winter of 2010-2011 was a big snow year, the biggest snow year since 2006. Seventy two (72) advisories were issued from mid November to May 15.
- ESAC website use increased by 15% this year, primarily in visits to the advisory page. Views of the avalanche advisory increased by about 4,000 views from the previous winter. More than half the people visiting the avalanche center website read the avalanche advisory. The avalanche advisory remains the centerpiece of the service provided by the ESAC.
- FOESAC started an informal observer program. Over 80 observer posts provided general and specific snowpack and avalanche observations. The program has potential to provide avalanche specialists with detailed snowpack information from a variety of locations. This season, many of the observers provided useful information that resulted in informative avalanche and snowpack discussions in the advisory.
- ESAC offered seven formal avalanche awareness presentations including outreach for the first time to the communities of Lone Pine and Bridgeport. Collaboration between the Forest Service and Neil Satterfield of Sierra Mountain Guides and Eric Diem, ski patrol director at June Mountain resulted in several public presentations and avalanche rescue training for Forest Service field employees. The public benefited from their combined experience and expertise.
- ESAC gave presentations to AIARE L3 and ski guide professional training courses.
- For the second year, ESAC and Neil Satterfield of Sierra Mountain Guides, provided avalanche awareness training for agency partners including CalTrans, the chief of the Mammoth Lakes Police Department, Inyo and Mono County undersheriffs and emergency services personnel from both counties. Increased communication and collaboration between ESAC, SCE, Caltrans and Inyo County were a direct result of the presentation.
- Caltrans requested avalanche assessments from ESAC on two occasions in April and May for road crews working to open the Tioga Pass Road.
- Region 4 utilized ESACs expertise and funded her to provide avalanche awareness education to the public in Bridgeport. The Humboldt-Toiyabe National Forest also provided funding for Sue to conduct avalanche terrain assessment and mapping for field biologists studying Red Fox populations.

### **Looking Forward: Future Opportunities and Needs**

During the 2010-2011 season, ESAC followed through on its commitment to education and public offerings. The Center increased the number of educational offerings for partner agencies. Based on the Center's educational success this year, we will continue to provide education for outlying areas of Inyo and Mono Counties. We will also work with partners to offer more education presentations for snowmobilers and other backcountry visitors.

The Center gave thoughtful consideration to opportunities such as increasing the number of advisories, or expanding the area covered by advisories. Several opportunities were identified for future development and a few key challenges were clarified into specific needs.

Volunteer observers were critical to Center's operations this year and the Forest Service plans to work with FOESAC to grow and improve the volunteer observer program ESAC. Forest Service avalanche specialists hold the public trust and reputation of their profession. We ask ourselves the question, "Am I tracking the snowpack properties well enough to confidently provide a danger rating?" Well trained observers can raise the level of confidence and assist in providing a better service to the public.

A professional observer program will assist in collecting information necessary to fill out the Avalanche Rose graphic in a credible way. Most people ski where the snow will be dry and light so west and southern aspects are rarely visited during the winter. Filling out the avalanche rose with enough information to support danger ratings assigned to these aspects will provide a better more credible service to the public.

Real time weather and snowpack data is essential for tracking day to day changes, storm events and seasonal trends needed to integrate weather forecasts into timely avalanche information. The advisory area only has four remote weather stations in a 160 mi<sup>2</sup> area. There is no wind data available from these stations and is a serious limitation to assessing avalanche danger due to wind loaded slopes. Wind loading is responsible for all of the recent backcountry avalanche fatalities with the possible exception of the Lone Pine fatality in November.

The Forest Service submitted a proposal to Mammoth Mountain to explore funding options with ESAC to provide a weather station at the top of June Mountain. Weather data from the top of June Mountain would make a tremendous improvement in June Mountain Ski Patrol avalanche control efforts while at the same time providing essential weather and snowpack information pertinent to the popular sidecountry areas adjacent to June Mountain.

## Advisory Area

The eastern Sierra Nevada lies between 36° and 38° N and is the largest single mountain range in the contiguous United States. The range contains nearly as much area as the French, Swiss and Italian Alps combined. The abrupt eastern escarpment ranges from 3,000 ft of vertical relief in the Mammoth Lakes area, 2500 ft in the Rock Creek area and 5500 ft in the Tioga Pass area.

The area covered by advisory danger ratings extends from the June Mountain region south to the Bishop Creek drainage, a distance of about 55 miles. The easily accessible winter front country of the Mammoth Lakes area is the focus of the majority of winter skiing activity. The steep avalanche terrain of the Negatives is easily accessible from the June Mountain ski area. Rock Creek is included in the advisory area and though Rock Creek is more remote, many people stay at the Rock Creek Resort and access steep cirques and bowls from the resort. Trailheads provide access to east side canyons ranging from 2-6 miles in length, resulting in a total area of about 160 square miles.



The advisory area is divided into areas defined by watershed boundaries. Avalanche terrain is easily accessible from numerous roads and trailheads. Snowmobiles are prohibited in wilderness areas but the new machines make it possible to ride extreme terrain outside wilderness boundaries. They also enable skiers and snowboarders easier access into avalanche terrain in and outside the wilderness.

The area covered this season by advisories was intentionally limited to provide better coverage for four specific drainages. These were Bishop Creek, Rock Creek, Mammoth Basin and June Lake/San Joaquin Ridge. This focused field data collection strategy ensured that ESAC provided the best possible product for the public and our partners. ESAC worked hard to develop a thoughtful strategy that resulted in regularly scheduled visits to these drainages and better information in support of advisories. In addition, ESAC selected study plots at 9,600 ft in Rock Creek Canyon and on Red Mountain and utilized reports from well trained weather and snowpack observers on the June Mountain Ski Patrol and well trained observers in Bishop Creek. These resources and field work enabled ESAC to track the Martin Luther crust evolution in and between each

area. This is an important step in aiding ESACs long-term understanding of Eastern Sierra snowpack.

Coverage for the June Lake area relied largely on the daily snowpack and weather data from June Mountain's ski patrol weather plot, snow study pits and control results at June Mountain. For the second year in a row, June Mountain Ski Patrol sent daily weather and snowpack observations from their study plot via a Google documents. This data critically augmented data from forecaster field visits.

### **Avalanche Advisories**

The avalanche advisory provides a single source and often the only source of information for people before going out to ski or snowboard. The avalanche advisory is the most visible service provided by the avalanche center. The purpose of the advisory is to give general ideas on what type of terrain might be safe and the type of terrain that might be avalanche prone. Ben Pritchett, avalanche forecaster for the Colorado Avalanche information center and a certified AIARE trainer, provided a template for avalanche advisory writing during the January L3 AIARE course. The template and Janet Kellum, of the Ketchum Avalanche Center's, snow stability worksheet helped organize and guide avalanche advisory writing at ESAC.

The avalanche advisory is a condensed version of the process of integrating many different pieces of information. Our theories may be proved or disproved by natural and skier triggered avalanche activity and weather and snow property measurements.

This season, advisories were issued by 7 AM on Wednesday, Friday and Sunday mornings. During storms and in the spring when conditions changed rapidly, daily advisories were issued. Record amounts of snowfall and windloading required avalanche advisory updates for many consecutive days in December, February and March.

Seventy four (74) advisories were issued from the end of November to May 15. Avalanche advisories are also posted on a daily basis during rapid changes in weather in the spring.

The Snowpack and Avalanche Discussion section gives a summary of current snowpack conditions, observations and provides the reasoning for the avalanche danger rating for the day. Advisories expire in 24 hours unless explicitly stated in the advisory.

The most direct information comes from observations of the snowpack, including recent natural and human triggered avalanches, cornice drops and ski cuts. Snowpit information can be useful but represents a snapshot of the snow on a very limited scale. Snowpit data is not representative of snowpack conditions over a region. Forecaster

confidence is low if observations are limited. We simply cannot assume limited observations represent region wide snow conditions and communicate this to the public by the wording of the danger ratings.

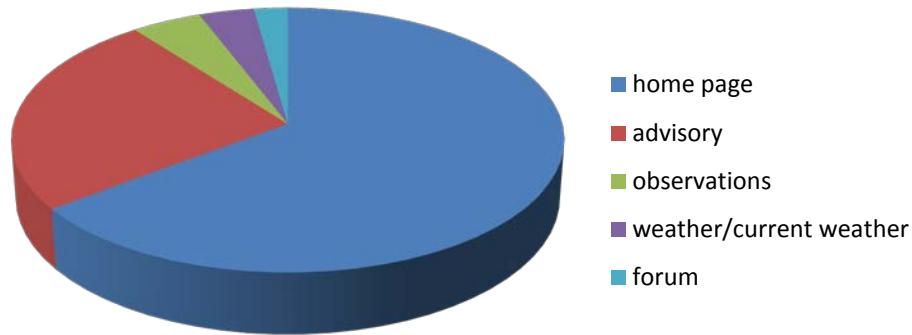
The primary limitation of the advisory is the amount of data available to the forecaster. Advisories are generally limited to areas the forecaster has visited unless qualified observers call, email or post observations on the website.

During winter storms when high rates of snowfall and wind loading occur, avalanche danger develops rapidly and access to the backcountry is limited by logistical and Forest Service safety protocols. Weather model output, current and forecasted jet stream analyses, remote weather station data and avalanche control results from June and Mammoth Mountain comprise necessary information in formulation of backcountry avalanche danger ratings.

The public accesses the advisories in the following ways:

- Printed advisories at the Mammoth Lakes Forest Service Welcome Center.
- 24 hour recorded telephone message (760.924.5500 and 760.873.2495)
- Local radio station KMMT broadcasted the avalanche danger rating three times a week all winter until the end of April.
- The avalanche advisory on the ESAC website, [www.esavalanche.org](http://www.esavalanche.org) was accessed over 21,000 times this season. This represents a 15% increase from the 2009-2010 season.
- Other parts of the website, including the observation page received only 3,800 visits this year. On average, visitors spent 30 seconds looking through observations and snowpit graphs. Over 51,000 visits to the home page were recorded, an increase of 13% over the 2009-2010 season. These website statistics are an important tool for planning and website development.

## 2010 - 2011 Website Statistics



### Avalanche Education

While the avalanche advisory is the most visible service provided by the Avalanche Center, avalanche awareness presentations provide background information required to understand the advisory and the avalanche danger rating. Introducing avalanche awareness to local emergency response groups and groups that lead organized ski tours or snowshoe tours, often leads them to take a professional avalanche education offered by local guide businesses.

Many recreationalists live outside the forecast area, but travel on weekends to the Inyo National Forest. ESAC's avalanche specialists stepped up efforts to provide educational offerings for visiting skiers, interagency personnel, and isolated areas of both counties.

Education is a way for the public to meet the avalanche specialist in a relaxed and interactive setting. Neil Satterfield, AMGA and AIARE certified instructor and local ski guide with an international guiding resume, joined ESAC for the second year as co-host of several avalanche awareness presentations.

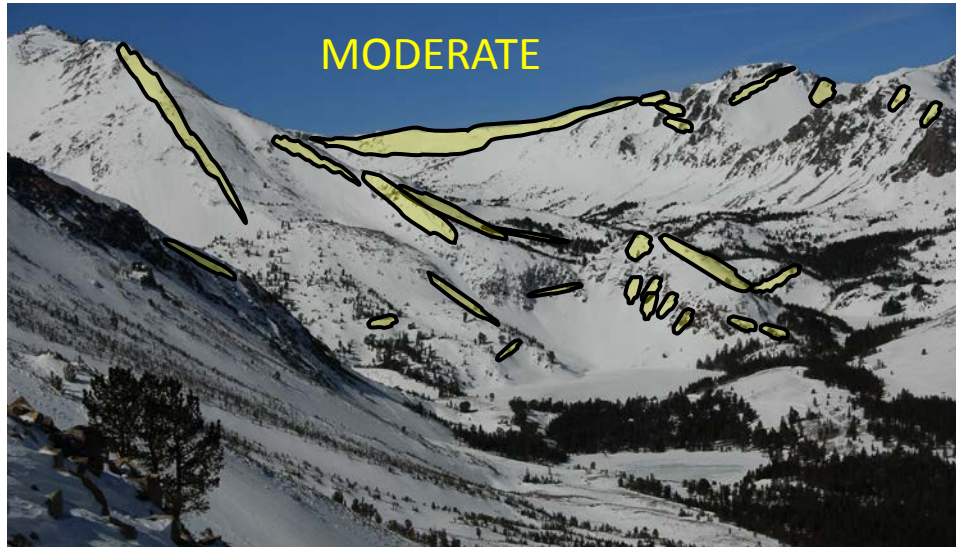


McGee Mountain wet slab avalanche, April 6 2011.

ESAC presentations included:

<b>June Lake</b>	<ul style="list-style-type: none"> <li>• AIARE L3 Professional Course</li> <li>• Two Level 1 presentations on interpretation of the U.S. Avalanche Danger rating scale</li> <li>• June Lake Community Center annual presentation</li> <li>• Avalanche Rescue training, June Mtn Ski Patrol with USFS and NPS</li> </ul>
<b>Lone Pine</b>	<ul style="list-style-type: none"> <li>• Avalanche awareness, high school</li> </ul>
<b>Bishop</b>	<ul style="list-style-type: none"> <li>• Avalanche awareness, high school</li> </ul>
<b>Mammoth</b>	<ul style="list-style-type: none"> <li>• Mammoth Avalanche Awareness Night</li> <li>• Mammoth Interagency Training</li> <li>• Avalanche awareness for snowmobiles, USFS, NPS &amp; BLM training</li> <li>• Season Snowpack Summary, AIARE Professional Ski Guides course</li> </ul>
<b>Convict Lake</b>	<ul style="list-style-type: none"> <li>• Splitfest Avalanche Awareness (second year)</li> </ul>
<b>Bridgeport</b>	<ul style="list-style-type: none"> <li>• Avalanche Awareness</li> <li>• Bridgeport Ranger District Staff Training</li> <li>•</li> </ul>

An example of the innovative approach used by the forecaster in her education programs is shown in the two graphics below. This graphic was used to help general public form a picture of how different avalanche danger ratings relate to familiar terrain.



Depiction of terrain mapped hazardous for a moderate advisory rating.



Depiction of terrain mapped hazardous for a considerable advisory rating for the same watershed.

## Finances & Funding

Most avalanche centers in the Western US spend 90% of their budgets on salary for forecasters, and ESAC is no different. A forecaster's job is multifaceted and includes many different tasks including, but certainly not limited to:

Forecaster job duties	% time
Field work and advisory writing	90%
Public education	Up to 4hr/day per presentation
Email /phone responses to public	10-15%
Collaboration w/ SCE, Caltrans, NWS	Variable, depends on weather
Relationship building w/ local businesses	Variable
FS administrative requirements	Variable, can be up to 8 hr/wk
Consultation w/ NAC, CAIC, UAC, etc.	Variable, 1-4 times per month

## Friends of Eastern Sierra Avalanche Center

The Eastern Sierra Avalanche Center is closely partnered with a non-profit 'Friends of' organization, whose responsibility is to fundraise, assist with outreach, and provide support to Center operations where necessary and appropriate. The organization is comprised of a completely volunteer Board of Directors who are local guides, business people, and working professionals that share a common interest in providing a public service focused on keeping people informed while travelling in the backcountry.

The 2010-2011 Board of Directors included:

**Nate Greenberg**

Vice President

**SP Parker**

Treasurer

**Howie Schwartz**

Secretary

**Forrest Cross**

Membership Director

**Allan Pietrasanta**

Director

**Scott Quirsfeld**

Director

Though the actual dollar amounts vary from year to year, the Friends of Eastern Sierra Avalanche Center (FoESAC) plays a vital role in keeping the Center going through annual financial contributions. During the 2010-2011 season, FoESAC provided funds to a second contracted forecaster (Josh Feinberg), who worked with the Forest Service forecaster, Sue Burak. This approach was chosen in lieu of contributing funds directly to the Forest Service in order to get a second forecaster working within the Center. Josh worked at the same capacity as Sue, and received direction from Forest Service supervisors over the course of the season. While this approach expanded the capacity of the Center, it was not without some issues, and will likely not be pursued as an approach in the future.

The Friends organization receives money through a variety of different sources, including grants from local agencies, events, merchandise sales, and a steady pool of members. Without the support of the local community, our efforts would not be possible.

### 2010-2011 Friends of Budget

<b>INCOME</b>	
Donations	\$5,000.00
Event Income	\$10,069.76
Grants	\$3,212.02
Membership	\$3,614.85
Other	\$199.75
<b>TOTAL INCOME</b>	<b>\$22,096.38</b>
<b>EXPENSES</b>	
Contract Forecaster	\$16,904.00
Beacon Basin	\$318.00
BOD Meeting Expense	\$391.33
Event Expenses	\$1,584.13
FoESAC Insurance	\$2,090.00
IRS, State of CA	\$10.00
Other Office	\$42.00
Merchandise	\$252.70
Website	\$523.45
Bank Fees	\$28.64
<b>TOTAL EXPENSES</b>	<b>\$22,144.25</b>
<b>NET INFLOW/OUTFLOW</b>	<b>(\$47.87)</b>

## Season Summary

The winter of 2010-2011 will be remembered as the winter of extremes- extreme snowfall, extreme dry spells and an extremely long and cold spring. The Eastern Sierra had a record three avalanche fatalities this year and the unusual weather and snowpack conditions this spring caught many people by surprise.

As the fall season came to an end, dire predictions of an unusually dry winter for Southern and Central California flooded the media. During La Nina episodes, the jet stream usually steers storms on a more northerly trajectory and northern California and the Pacific Northwest receive the majority of snowfall, leaving the eastern Sierra and Southern California dry.

The first indication this winter was going to be an unusual one occurred near the end of October. A warm subtropical storm dropped 4 to 6" of rain in the mountains. The Owens Valley picked up close to annual precipitation from the storm. An ice layer formed on Mammoth Mountain and isolated areas in the backcountry. Many full depth avalanches ran on this ice layer two months later during the huge Dec. 19-22 storm.

The next indication La Nina was affecting weather patterns in an unexpected way occurred before the Thanksgiving Day holiday. Mammoth Mountain was able to open on natural snow for the first time in many years and front country skiing in the Mammoth area was possible to the delight of everyone. The first fatality of the winter occurred in November when a climber descending a steep series of ledges off the North Fork of Lone Pine Creek, was found days later with a skull injury, face down under a foot of snow.

By the middle of December, meteorologists at the National Weather Service office in Reno were buzzing with excitement as they showed me satellite images of a subtropical stream of moisture curving across the entire Pacific Ocean, heading to central California. Several days later, snow started falling and the fire hose was aimed directly at Mono County.

Snow came in waves of intense precipitation and snowfall rates. December 19, 2010 stands out as the day when precipitation intensities averaged 0.3" an hour for 5 to 7 hours and 24 hour Snow Water Equivalent totals ranged from 3-5". Several days later, on December 22, occasional patches of blue sky were a welcome sign the storm was mostly over. It was time to assess impacts from the most powerful winter storm since February 1986.

The Eastern Sierra received 10 to 16 inches of water and 110 to 120 inches of snow in five days. The high precipitation intensities and strong wind resulted in several avalanche cycles during the storm. The high precipitation intensities on December 19 probably resulted in the largest avalanches. Surface sluffing was widespread once skies

cleared and the 10 foot deep snowpack was an early Christmas present for skiers and riders, provided they could shovel their way to the last known location of their cars.

After such a huge powerful storm, it took some time for high pressure to build back into the area. Postfrontal winds raged after a cold storm dropped another foot of snow over the higher elevations. The first reported near miss occurred during a subsequent the wind event that brought sustained ridge top winds of 40-60 mph. A well-known local skier was ascending a steep wind scoured slope when he reached a wind-loaded convexity and decided to turn around. He triggered a soft slab that carried him about 250 vertical feet and deposited him right above a stand of trees.

The first ten days of January were cold, windy, and unsettled. A local party changed their ski plans when snow plumes obscured the ridgetops and their skiing objective for the day. They selected what they believed to be a safer alternative- a steep, committing north facing line they believed would be sheltered from wind loading. The first skier down triggered a slab avalanche that broke above him and he cart wheeled down 1,500 vertical feet. He was shook up, bruised, and lost some gear but fortunately otherwise escaped injury.

After the excitement of early January, the traditional January dry spell overextended its welcome and lasted until the middle of February. On the Martin Luther King holiday weekend, high dew points and above average air temperatures resulted in surface melt, a 5-10 cm thick melt freeze crust (see picture below), and spring snow skiing on south aspects up to 13,000 ft.



Melt Freeze Crust

Once the next round of multiday storms began, a month of cold temperatures had transformed the crust to a coarse, faceted and disintegrating layer- the most prominent feature in the Sierra snowpack.

The extreme dry spell ended with 5 to 6 feet of snow falling in a couple of days. Widespread whumping, planned and unplanned skier triggered slides and consistent fracture and propagation on the Martin Luther King crust were clear indications the snowpack was going to take a while to adjust to the new load.

After a long dry spell, the lure of powder skiing drew many locals to leave the June Mountain ski area boundaries during the height of the storm when visibility was low due to strong winds and heavy snowfall. June Mountain's ski patrol director lectured several experienced groups as they left the boundaries because ski patrol is responsible for avalanche rescue in the side country. Such is the lure of powder skiing.

March came in, but not like a lamb, with two storms in the first week dropping 12-20 inches of dense snow over the eastern Sierra. By now, snowpacks were already above average for the winter. La Nina was capricious and unpredictable this time around.



Pine Creek avalanche, March 22, 2011.

The next siege of winter storms hit the area the third week of March dropping another 3-5 ft over the region followed by another 2-4 feet the last week of March. This time around, March sun was stronger and elevations up to 7500 to 8,000 ft melted out in a day or so. As happened with earlier storms, these ones came in with sustained winds and wind loading that triggered a few rare class five avalanches in the Pine Creek drainage south of Mammoth. Though starting zones were 12,000 ft and higher and slabs were triggered by wind loading, by the time the avalanches reached 7500 ft the debris was a wet dense mass of channels and runnels and covered several football fields' worth of terrain with 10-15 ft debris piles.

Unusual weather results in unusual snowpack conditions and avalanches. The cold windy spring continued through April. Despite strong solar radiation, north-facing aspects above 10,000 ft remained cold due to a combination of high albedo (reflectivity of the snow) , cold temperatures, and the ever-present wind helping keep snow surfaces firm.

Two fatalities occurred at the end of April when two out of area skiers attempted a steep ski descent on Split Mountain. Strong winds prior and during the ascent of the couloir created an unstable wind slab the skiers most likely triggered on their ascent. Winds were so strong helicopters were unable to retrieve the bodies for four days.

It's going to be a long spring skiing season here in the Eastern Sierra, one lasting well into June and possibly July. ESAC hopes visitors will continue to be aware of weather and snowpack conditions and plan ski routes accordingly. It has been both the best and worst of winters- powerful storms, great skiing at times, an interesting and complex snowpack, and unfortunate losses.

### **Acknowledgements**

ESAC and our Friends organization FOESAC acknowledge the following people who freely donated their time and expertise and made the 2010-2011 season successful in many ways.

#### **Neil Satterfield**

Neil went out of his way to keep ESAC apprised of patrol control results despite his hectic schedule. Neil's expertise as a guide and his dynamic AIARE presentations inspired ESAC to improve the organization and content of our avalanche awareness presentations and the collaboration provided a high quality education experience for the public. Judging snow stability is like putting the pieces of a puzzle together for a puzzle that always has missing pieces and Neil helped fill in the missing pieces.

#### **Eric Diem**

Eric Diem's knowledge and experience with the snowpack around June Mountain was priceless this winter. Always energetic and eager to talk about current conditions, Eric always delivered the latest weather and snow observations from June Mountain and the surrounding side country. Eric volunteered many hours to advertise local avalanche events and traveled to Mammoth to give his lively presentation to a group who traveled over one hundred miles for a Forest Service education event. Eric and Neil supported the center by providing detailed coverage of control results on June Mountain and tracked wind loading and persistent weak layers that could be tracked in the popular backcountry areas accessible from the resort.

#### **Howie Schwartz**

Thanks to Howie, for his invitation to talk to his Level 3 AIARE course and transforming Sue's ideas about AIARE. Howie and Neil inspired ESAC forecasters to become AIARE avalanche educators.

#### **Contributors**

Many people, local agencies and local businesses contributed financially to the success of the Eastern Sierra Avalanche Center. We extend a hearty thanks to all of them and specifically want to note the contributions of Mono County, Inyo County, the Humboldt-Toiyabe National Forest and , the Town of Mammoth Lakes Measure R Fund, Town of

Mammoth Lakes Tourism and Recreation Department, the Little-Kittenger Foundation, The Sunset Foundation, as well as all of our individual donors and members.

## Supporters

- Town of Mammoth Lakes, Measure R Grant Funding
- County of Inyo
- County of Mono
- Donald M. Slager Sunset Foundation



- A countless number of members and local businesses who provided financial and in-kind contributions