

SURVEY OF US AVALANCHE CENTERS

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ABSTRACT: In the fall of 2009 I became interested in when offices are staffed by forecasters at the various centers and what time of day products are issued. In other words are the hours inhumane at all the centers? How much do product issuance times vary between the centers? I decided to survey the various centers regarding this and a few other topics. Later I learned of a similar survey compiled by Knox Williams in 1998. So I added some questions to my survey in order to update his work. My survey turned out to have more questions than I originally imagined; but later I thought of more questions I could have asked.

So the results of this survey include various topics such as administration, pay, forecast area size, budget, hours of operation, weather stations, weather and avalanche product information, dissemination methods, product issuance days and times, avalanche education, and length of seasonal employment. I hope the results are informative and useful to any interested persons.

I would like to emphasize that I did not undertake this survey in order to show any particular results. Rather the work was undertaken out of interest in similarities and differences between the various centers.

1. INTRODUCTION

The survey was emailed to the US Avalanche Centers shown on the Westwide Avalanche Network home page (www.avalanche.org). This paper presents partial results due to the 8 page limit for the ISSW 2010 Proceedings. Further or full results may be published later such as in the Avalanche Review or may be obtained by contacting the corresponding author. An occasional comparison may be made to the earlier work of Williams (1998).

2. RESULTS

The partial results will be summarized in this section and readers are welcome to draw their own conclusions.

2.1 *Sources*

Sources of information are listed in Table 1. There are now about twice as many avalanche centers in the US as indicated in Williams (1998).

2.2 *Mid winter staff and pay/grade*

Staffing ranges from volunteers or a couple to a

few paid staff up to the 8 to 15 paid staff at Utah and Colorado respectively as shown in Table 2. Of the 7 centers listed by Williams (1998) 4 centers had an increase in staff (Colorado, Utah, Bridger-Teton, Sierra), 2 stayed the same (Central Idaho/Sawtooth, Gallatin) and 1 center had a decrease (Northwest). Pay is mostly in the federal GS7 to GS9 range with annual pay up to \$60,000 to \$80,000 or GS12 at the Colorado, Southeast Alaska and Northwest Centers.

2.3 *Forecast area size and elevations*

Forecast area sizes shown in Table 3 range widely from the 2 km² at Mt Washington to the 120,000 km² in Colorado. Of the centers listed by Williams (1998) the only significant change indicated in forecast area size has been a doubling of the forecast area in Colorado. The smallest forecast elevation range is also at Mt Washington and most of the rest are in the range of several thousand feet. Not surprisingly the lowest elevations are at the Alaska centers, and the Northwest and Mt Washington Centers. The higher elevations are in the interior and at the southern centers.

2.4 *Approximate budget*

Most of the centers make do with less than \$100,000. Four centers fall into the \$100,000 to \$332,000 range and Colorado with the largest staff has a budget of \$825,000 (Table 4). Direct and in-kind contributions to the budgets are primarily governmental, especially USFS, but there are also contributions from Friends groups, ski areas, small

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towns and a couple of universities. Two centers get contributions from their state DOT programs (Colorado, Northwest).

2.5 Weather forecasts

Most of the centers issue a weather forecast; about half of them daily around 7 am (Table 5). Forecasts are mostly made out to 1 or 2 days. Three centers (Colorado, Northwest, Utah) are located in NWS offices and the NWS issues products specifically for three other centers (Bridger-Teton, Glacier Country, Payette). Only Colorado indicated that they run an in-office model which is an orographic precipitation model.

2.6 Avalanche forecasts

About half the centers issue avalanche forecasts daily and the others 1 to 4 days a week (Table 6). The majority issue the avalanche forecast in the morning around 7 am and use a 1 day range. The predominant forecast technique is conventional; this was also the case in Williams (1998). See that paper for a definition of conventional forecasting technique. The Mt Shasta and Sawtooth Centers noted some worthwhile variations in their forecasting technique. The Cordova Center issues on an as needed basis; the Kachina Peaks Center hosts an information sharing system; and the Wallowa Center offers weekly summaries. Only Bridger-Teton and Eastern Sierra Centers indicated that a model is used; a nearest neighbors and occasionally a nearest neighbor for Mammoth Mountain ski area respectively.

3. Hindsight

Other questions I could have asked might have been: How long has your center been in operation? Or: How long is your forecast season?

4. References

Williams, Knox, 1998. An Overview of Avalanche Forecasting in North America. ISSW 1998 Proceedings, 161-169.

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Table 1. Sources of Information

Contact	Center	Email	Phone
Bob Comey	Bridger-Teton National Forest Avalanche Center	comey@wyom.net	307-690- 4527
Carl Skustad	Chugach National Forest Avalanche Information Center	cskustad@fs.fed.us	907-754- 2346
Ethan Greene	Colorado Avalanche Information Center	ethan.greene@state.co.us	303-204- 6027
Steve "hoots" Witsoe	Cordova Avalanche Center	hoots@ctcak.net	907-424- 4668
Sue Burak	Eastern Sierra Avalanche Center	sb@snowhydrology.com	760-935- 4129
Doug Chabot	Gallatin National Forest Avalanche Center	dchabot@fs.fed.us	406-587- 6984
Stan Bones	Glacier Country Avalanche Center	sbones@fs.fed.us	406-758- 5284
Kevin Davis	Idaho Panhandle Avalanche Center	kevingdavis@fs.fed.us	208-265- 6686
BJ Boyle	Kachina Peaks Avalanche Center	bj.boyle@kachinapeaks.org	928-814- 6006
Eric White	Mount Shasta Avalanche Center	ewhite@fs.fed.us	530-926- 9617
Christopher Joosen	Mount Washington Avalanche Center	cjoosen@fs.fed.us	603-466- 2713 x215
Mark Moore	Northwest Weather and Avalanche Center	mark.moore@noaa.gov	206-526- 6164
John Groom	Payette Avalanche Center	jgroom@fs.fed.us	208-315- 2988
Janet Kellam	Sawtooth National Forest Avalanche Center	jkellam@fs.fed.us	208-622- 0095
Brandon Schwartz	Sierra Avalanche Center	Brandon@sierraavalanchecenter.org	530-414- 4505
Tom Mattice	Southeast Alaska Avalanche Center	Tom_Mattice@ci.juneau.ak.us	907-586- 0419
Bruce Tremper	Utah Avalanche Center	bruce@utahavalanchecenter.org	801-231- 4744
Keith Stebbings	Wallowa Avalanche Center	director@wallowaavalanchecenter.org	603-340- 5381
Steve Karkanen	West Central Montana Avalanche Center	skarkanen@fs.fed.us	406-329- 3752

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Table 2. Mid Winter Staff and Pay/Grade

Center	Staff Level	Pay Grades or Pay
Bridger-Teton	4 FT, 2 PT	2 GS-9, 4 GS-8
Chugach	3 FT, 1 PT, 1 FT intern	1 GS-9, 1 GS-7, 1 GS-6
Colorado	14 FT, 1 PT	Physical Scientist/Research Scientists 1-5, about \$60k-\$80k not including benefits
Cordova	1 FT, 1 PT	FT \$4,000/month, PT \$1,000/month
Eastern Sierra	1 FT, 1 120 hour OT employee.	FT is GS-8
Gallatin	3 FT	1 GS-9 permanent seasonal, 1 GS-7 permanent seasonal, 1 GS-7 temporary seasonal
Glacier Country	2 PT (approx. 3 days/week each)	1 GS-10, 1 GS-9
Idaho Panhandle	7 PT	2 GS-9, 4 GS-7, 1 GS-5
Kachina Peaks	All volunteer based staff.	
Mount Shasta	2	1 GS-7, 1 GS-6
Mount Washington	4 FT	1 GS-11, 2 GS-8, 1 GS-7
Northwest	3 FT	3 GS-12, all are professional meteorologists
Payette	2 FT	1 permanent year round GS-7, 1 winter seasonal GS-6
Sawtooth	3 FT	1 GS-9 (Director and Forecaster) Permanent 13/13, 1 GS-8 (Lead Forecaster) Term 13/13, 1 GS-8 (Forecaster) 1039 Seasonal approx. 4 ½ months
Sierra	2 FT staff, 2 PT field observers	Forecasters are GS-8, Observers are contracted at \$130/day.
Southeast Alaska	1 FT, 1 PT seasonal, office assistant as needed	FT \$65,000/year, PT seasonal at \$14 per hour.
Utah	8 FT	1 Director GS-9, 7 Forecasters GS-8
Wallowa	2 volunteers	
West Central Montana	1 FT Director/Forecaster, 1 PT Forecaster/educator, 6 PT observers	Director is GS-9 permanent FT, Forecaster/educator is \$30 per hr, PT observers are GS-7 to GS-11. Observers are paid from contributed dollars (home unit programs cover their salary to collect snow data once a week).

FT = Full Time, PT = Part Time, OT = Overtime, some respondents chose to offer permanent and seasonal information.

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Table 3. Forecast Area Size and Elevations

Center	Forecast Area	Size	Elevation Range (feet)
Bridger-Teton	Western Wyoming	5,000 mi ² (13,000 km ²)	5,500 - 10,500
Chugach	Kenai and Chugach	233,590 acres (945 km ²)	0 - 6,000
Colorado	Colorado Rocky Mountains	120,000 km ²	7,000 - 14,440
Cordova	SE Chugach Mountains	3,000 km ²	0 - 4,000
Eastern Sierra	Eastern Sierra Nevada		7,000 - 13,000
Gallatin	Bridger, Gallatin, Madison, Henry, Washburn Ranges, and the area outside Cooke City, MT	10,000 km ²	7,000 - 11,000
Glacier Country	NW Montana, seven mtn ranges	5,000 mi ² (13,000 km ²)	3,000-7,500*
Idaho Panhandle	Selkirk, Cabinet, Bitterroot, St. Joe		3,000 – 7,600
Kachina Peaks	Kachina Peaks Wilderness	15000 acres (61 km ²)	9000 - 12600
Mount Shasta	Mt. Shasta and Castle Crags to Mt. Eddy	1000 km ²	5400 - 14,000
Mount Washington	A portion of the Presidential Range in the White Mountains	2 km ² - a high use area with ratings for 16 snowfields and gullies.	3850 – 5400
Northwest	Olympics, Washington Cascades, Mt Hood	50,000 km ²	3000 - 7000*
Payette	West Central Mountains	300,000 acres (1214 km ²)	5000 – 9000
Sawtooth	Pioneer, Smokey, Boulder, Sawtooth, White Cloud, Ranges, foothills of the Wood River Valley	4,000 km ²	5,000 - 10,000
Sierra	Central Sierra Nevada Mountains	4000 km ²	6,000 - 10,700
Southeast Alaska	Southeast Alaska Coast Range.	20 mi ² (52 km ²)	0 - 4,000
Utah	Wasatch Range, Bear River Range, Manti Skyline, La Sal Mountains	12,500 km ²	5,000 - 12,000
Wallowa	Wallowa Mountains of NE Oregon	350,00 acres (1,400 km ²)	6500 – 10000
West Central Montana	Bitterroot, Rattlesnake, south Mission, south Swan Mountains.	25,000 km ²	5000 ft – 9000

*Higher mountains exist.

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Table 4. Approximate Budget

Center	Annual Budget	Financial Contributors	In-kind Contributors
Bridger-Teton	250	USFS 75, Friends 100	Jackson Hole Mountain Resort 75
Chugach	50	USFS 38	Friends 12
Colorado	825	USFS 20, Ski Industry 30, CDOT 400, other city and county and private donations	NWS 100, CDOT 100, CGS 100, USFS 10, Town of Breckenridge 10
Cordova	30	City of Cordova	
Eastern Sierra	32	USFS, Mono County.	
Gallatin	130	USFS 84, Montana FW&P 22, Gallatin County SAR 4, Friends 19	40
Glacier Country	28	USFS 20, Montana Dept of Fish, Wildlife, Parks 6, Friends 2	NWS 5, Volunteers 8
Idaho Panhandle	30	USFS 25, Idaho Parks and Recreation 5	
Kachina Peaks	3 - 5	No financial support from other agencies.	USFS and volunteers administer permit system to enter Wilderness in Winter
Mount Shasta	50	USFS 40, Friends 10	NWS 20
Mount Washington	100	USFS 100, Friends 1	Mount Washington Volunteer Ski Patrol 38
Northwest	332	USFS 105, NPS 17, State Parks and Recreation 88, DOT 45, Ski Areas 25, Friends 5, private 47	NWS 70, also USFS, NPS, DOT, Ski Areas
Payette	50	USFS 26, Idaho Department of Parks and Recreation 5, RAC 18, City of McCall 1-2, Friends 1-2	Idaho Dept of Parks and Recreation snowmobiles, USFS vehicle
Sawtooth	117	USFS 49, BLM 5, Idaho Dept Parks & Recreation 5, Friends 50	USFS 8, Sun Valley Company 5, NWS, SNOTEL special ftp site
Sierra	70	USFS 25, Friends 38	USFS 7
Southeast Alaska	100	City and Borough funds its own forecast	NWS and University of Alaska Southeast 10
Utah	280	Friends 100, Utah State Parks 82, USFS 63, Utah Public Safety 25, Salt Lake County 23, United Fire Authority 15	NWS 20
Wallowa	4	Community and Sponsors 2, SAR 1, Donors 1 - 2	
West Central Montana	31	USFS 5, MT FWP 16, Friends 10	USFS 44, NOAA 15, U of M 5, other 3

Figures in dollars in nearest thousands.

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Table 5. Weather Forecasts

Center	Issuance Days	Issuance Times	Range	Comments
Bridger-Teton	2 daily	200, 1400	8 hours, 48 hours resp.	NWS runs model in Riverton, WY specifically for us.
Chugach				
Colorado	3 daily	600, 1300, 1400	36 hours (3 12 hr periods)	NWS AWIPS access. We collaborate to run MM5.
Cordova	1-3/week	800	1-3 days	w/in avi forecast
Eastern Sierra	3/week	700	1 day winter, 1-2 days spring	
Gallatin	Daily	730	24 hours	
Glacier Country				NWS 1 day forecast issued 1430 daily.
Idaho Panhandle				
Kachina Peaks				
Mount Shasta	3/week (every advisory)	700	Specific for 1 day and general for next 4 days	Also indicated NCEP, Cansac MM5, Nexlab, CPC, Cal/Nev River Forecast Center sources.
Mount Washington				
Northwest	Daily	700	2 day detailed, 3-5 day extended	NWS AWIPS access.
Payette				NWS produces spot forecast for us
Sawtooth	Daily	730	1 day with outlook	Also indicated NWS Pocatello and Boise information is used.
Sierra	Daily	7am	2 day	Also indicated Penn State, Unisys, NCAR, U of WA model data is used.
Southeast Alaska	Daily	7am	24 hours	We do not produce but we share NWS data.
Utah	2 daily	700, 1200	24 hours with summary extended	NWS AWIPS access.
Wallowa				
West Central Montana				

All centers that indicated a weather forecast also indicated NWS and Internet sources. Only Colorado indicated that they run an in-office model which is an orographic precipitation model. Colorado, Northwest, and Utah have NWS AWIPS computer access as they are co-located with NWS offices. Many centers issue their weather forecast with the avalanche forecast.

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Table 6. Avalanche Forecasts

Center	Issuance Days	Issuance Times	Range	Forecasting Technique	Comments
Bridger-Teton	Daily	700, 1800	700 1 day, 1800 next day.	Conventional	Tested immediately via expl., obs
Chugach	Daily	700	1 day	conventional	
Colorado	Daily	730	24 hours	conventional	
Cordova	1-3/week	800	1-3 days	conventional	As needed
Eastern Sierra	3/week	700	1 day winter, 1-2 day spring	Conventional	
Gallatin	Daily	730	24 hours	conventional	
Glacier Country	Tue, Fri	700	1 day	conventional	
Idaho Panhandle	Fri	730	24 hour hazard rating and Sat, Sun outlook	conventional	
Kachina Peaks					Information sharing.
Mount Shasta	3/week	700	1 day plus 4 day trend on Sunday	Conventional plus charts by Stetham from ISSW 2008.	
Mount Washington	Daily	800	1 day with discussion of tomorrow	Conventional	
Northwest	Daily	1200	2-3 day	Conventional	
Payette	Mon, Wed, Fri, Sat	730	24 hours	Conventional	
Sawtooth	Daily	730		Forecaster and team information sharing	
Sierra	Daily	700	1 day	conventional	
Southeast Alaska	Daily	700	24 hours.	conventional	
Utah	Daily Wasatch, 3/week other areas.	700	2 or more days.	Conventional	
Wallowa	Fri	600			Weekly summaries
West Central Montana	Mon, Fri as needed	700	2 day with hazard rating first 12 hours.	conventional	

Only Bridger-Teton and Eastern Sierra Centers indicated that a model is used; a nearest neighbors and occasionally a nearest neighbor for Mammoth Mountain ski area respectively.