

## AVALANCHE HAZARD STUDY OF THE LA SAL MOUNTAINS, UTAH

Prepared for Colorado Outward Bound School

by Rod Newcomb, March 1987

### DESCRIPTION OF AREA

The La Sal Mountains rise abruptly out of Canyonlands Country from the Colorado River to 12,721 feet, a verticle rise of 8,000 feet. The formation is a laccolith, with the overlying strata largely eroded away exposing granite which is fractured and not good for climbing. Timberline is between 11,000 and 12,000 feet. The canyons are glaciated with spectacular cirques. There are three massives: the northern (Haystack Mountain); the central (Mt Mellenthin, Mt Peale, and Mt Tuhunikivatz); the southern (Lough Mountain). Geysers Pass separates the northern and central massive and La Sal Pass separates the central and south massive.

### PURPOSE OF STUDY

The purpose was to compare the snowpack with the Wasatch and San Juan Mountains, take a close look at some of the avalanche paths, and look at the terrain with the purpose in mind of moving patrols through the mountains.

### DESCRIPTION OF THE CLIMATE AND AVALANCHE PATHS

This winter the snow pack is similar in structure to that of Colorado. The depth in Gold Basin is 130 cm, with the bottom 40 cm composed of depth hoar formed during the December drought. From the geographical location of the La Sal, it can be assumed that the snowpack is usually similar to the Colorado Rockies and/or the Wasatch. Both of these areas have some degree of structural weakness in the snowpack from temperature gradient snow.

Snow depths this year as measured by the USFS in Moab are greater than normal with March 1 measurements of 68.5 inches (water content of 18.1 inches) at 9600 feet. This is 140% of normal. At 8800 feet depth there is 30.4 inches (water content of 8.9 inches). The difference in precipitation with increase in elevation is very large, pointing out the orographic effect of the storms moving over the mountains.

Avalanche paths vary from large to small and can be found at all elevations. Vegetation damage below tree line indicates maximum size avalanches run approximately every 100 years. Some paths loaded by prevailing winds most likely run as small to moderately sized avalanches every year.

Weather records at Miners Basin (elevation approximately 10,000 feet) are included from 1973 to 1983. This data was gathered by Liam Fitzgerald and Peter Schorey in June 1983 for the Exxon Gold Basin Drilling Project - see charts #1 through #4. This data indicates relatively low snow fall amounts, mild days and cold nights, and enough clear weather to produce a typically weak temperature gradient snowpack.

#### FEASIBILITY OF MOVING PATROLS THROUGH THE LA SAL MOUNTAINS WITH REGARD TO AVALANCHES

For a two day tour, I, [redacted], COBS Course Director, and [redacted] of [redacted] Basin as our objective as a special cirque. It is encircled by Mt. [redacted] 12,483 feet, and several unnamed peaks, of which point 12,240 has been named Mt. Laurel by the locals. The second day, Mar 7, we climbed Mt. Laurel and could see much of the proposed terrain and some of the possible passes the courses could traverse.

There was extensive avalanche activity in Gold Basin from two storms about March 15-16 and March 24-25. Browns were observed up to four and five feet and were continuous throughout most of the upper basin. The avalanches did not run long distances. Avalanche activity was on north to east facing slopes. Fracturing and collapsing of the snowpack without avalanching was observed to have taken place during the last storm on many slopes up to about 35 degrees. On the morning of the ascent of Mt. Laurel, the snow on the south facing slopes was frozen 1 inch thick from warm weather the previous few days. No unstable snow was encountered during our tour.

From the summit of Mt. Laurel we could see the approaches to Geyser Pass which appears to be a safe route in any avalanche condition. Careful route finding should be used to avoid steep side gullies and small steep slopes. The pass from Dark Canyon to Horse Creek should only be traversed with a patrol under very stable conditions with a strong snowpack. In general, the view from Mt. Laurel confirms what the map indicates, that in most avalanche conditions with safe routefinding a complete circumnavigation

can be made of the Central Massive using La Sal and Geysir Passes.

RECOMMENDATIONS FOR LA SAL WINTER COURSES

1. Keep a diary of the winter weather (Mark Yates is currently doing this). This will help determine the evolution and strength of the snowpack. Evaluate the snowpack with a snow pit and record the data once a month at the 10,000 foot elevation. A profile of the hand hardness test is all that is necessary. In the event of litigation, these records will help to convince a jury that you are doing everything possible to avoid accidents.
2. Make sure the instructors are experienced in the art of making stability evaluations in the field and use proper judgement in route finding according to snow conditions. Snow pits should be dug on various exposures during the courses to evaluate snow stability.
3. During periods of instability, conservative routes that avoid avalanche paths should be picked by instructors.
4. Prior to taking control over a steep pass, check out snow stability first with instructors.

MONTHLY TOTAL SNOWFALL IN INCHES

Season	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total Snowfall For Year
78-79	40"	28"	48"	75"	76"	65"	29"	29"	353"
80-81	39"	26"	10"	25"	22"	57"	18"	19"	216"
81-82	48"	29"	34"	59"	22"	61"	8"	17"	278"
82-83	33"	57"	59"	17"	50"	60"*	18"*	21"*	302"***
Average	40"	35"	37.5"	44"	42.5"	60"	18"	21"	287"

\* No records available for these months.  
Average from previous years used.

\*\* Estimated total.  
Actual total probably considerably higher.

MONTHLY AVERAGE HIGH-LOW TEMPERATURES AT 10,000'

Season	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	
78-79	Hi	41°F	26°F	23°F	29.5°F	36.1°F	45.7°F	49.1°F	
	Lo	16.7°F	3°F	1.5°F	6.8°F	12°F	19.1°F	26.8°F	
80-81	Hi	48°F	38°F	34.5°F	35.2°F	37.1°F	48.2°F	49°F	
	Lo	22.9°F	16.4°F	13.1°F	9°F	10.5°	25.0°F	26.1°F	
81-82	Hi	42°F	38.4°F	31°F	32.9°F	32°F	34.9°F	49°F	
	Lo	22.6°	17.6°F	9.5°F	3.7°F	7.3°F	12.5°F	18.2°F	26.2°F
82-83	Hi	41°F	31.4°F	37.4°F	31°F	29.5°F			
	Lo	20.9°F	12.4°F	7.8°F	10.4°F	11.0°F			
Average Temp.	Hi	43.5°F	37.2°F	31.4°F	30.3°F	31.5°F	36°F	45.4°F	49°F
	Lo	22.1°F	16.2°F	6.7°F	7.1°F	8.5°F	11.6°F	20.7°F	26.3°F

Chart #3

Month	# of Clear Days	# of Days With Snowfall of 1" or more	# of Days With * High Winds
Jan. 79	7	16	4
Feb. 79	10	11	3
March 79	6	13	4
April 79	11	5	2
May 79	12	6	2
Oct. 80	19	7	0
Nov. 80	18	4	0
Jan. 81	14	6	1
Feb. 81	13	7	1
March 81	2	17	2
April 81	6	5	4
May 81	5	7	0
Oct. 81	9	11	3
Nov. 81	11	7	4
Dec. 81	9	8	5
Jan. 82	11	9	0
Feb. 82	12	6	5
March 82	5	15	2
April 82	7	4	3
May 82	10	3	2
Sept. 82	4	4	7
Oct. 82	7	6	2
Nov. 82	11	12	0
Dec. 82		8	2
Jan. 83	10	9	4
Feb. 83	6	11	4

\* Wind conditions monitored at 10,000', not at ridge tops,  
where winds would be stronger and more constant.

AVERAGE SNOW DEPTH PER MONTH AT 10,000'

November 1978	10"
December 1978	31"
January 1979	55"
February 1979	70.5"
March 1979	76"
April 1979	76"
May 1979	41"
October 1980	13"
November 1980	15"
January 81	25"
February 1981	31"
March 1981	37"
April 1981	35"
May 1981	3"
September 1982	5"
October 1982	10"
November 1982	20"
December 1982	44"
January 1983	51"
February 1983	64"
May 1983	100"