



# **PACIFIC REGION TECHNICAL NOTES**

82-007  
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The Southwestern Coast Snowfall Verification  
1981/82

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## INTRODUCTION

The verification of snowfall forecast amounts for Grouse, Whistler, and Allison Pass has been carried on for some years at the PWC. It had been hoped that the verification program would be expanded to encompass more areas of the province, but time constraints have worked against this plan. Data for Rogers Pass is presently being processed, and results should be available for publication in this series.

## THE WINTER OF 1981/82

In contrast to the previous year, the past winter was a "snow-rich" one on the coastal mountains. A solid base of snowcover was laid down in November. Transitory warm spells occurred during the first half of December, but the arctic front slipped across the coast in the third week, bringing more snow. The new year began on a clear and cold note. The remainder of January consisted of snowy periods, with only two brief mild spells. Heavy snows occurred near the middle of the month, when falls of near 50 cm. per 24 hours were recorded at several of the sites. February and the first half of March consisted of a normal winter pattern. Snowy periods were interrupted by brief occurrences of rain in advance of progressive Pacific fronts. The rain was generally confined to elevations below 1800 metres. The snowdepth continued to build up during this period. The third week of March was clear and cold. The last week was once again snowy.

## THE VERIFICATION

The verification procedure is unchanged from years past. Amounts have been separated into ranges of 0, 0.1-10, 11-20, 21-50, and greater than 50 cm. per 24 hours. With the statistical guidance, water equivalent millimetres are considered. Occurrences and forecasts have been compared in contingency table form.

### THE STATISTICAL GUIDANCE

Figures 1, 2, and 3 represent the contingency tables of the statistical guidance (MTNP1) versus the recorded 24 hour precipitation (water equivalent). It is seen that 38 to 41% of the statistical amounts fall in the correct category, and are labelled as "hits". Events where the occurrence and forecast are in adjacent categories, account for between 36 & 40% of the cases. The remaining cases fall into the "miss" category.

It is seen from the contingency tables that the MTNP1 program has a significant tendency to overforecast. In particular, the large number of predictions in the 21-50 mm. column are not reflected in the occurrence row. In fact, there is a predominance of recorded precipitation values in the 0.1 to 10 mm. range.

### THE SUBJECTIVE SNOWFALL FORECASTS

Figures 4, 5, and 6 represent the verification of the snowfall predictions issued with the 5 AM PWC Mountain Forecasts. The percentage of "hits" range from 56% at Allison to 64% at Whistler. "Near misses" add another 30 to 39%. Missed forecasts account for the remaining 5 to 7% of the cases.

Trends over the past 7 years at Grouse and Whistler are depicted in Figures 7 and 8.

### CONCLUSIONS

The percentage of "hits" at Grouse Mountain is down considerably from that of the last winter, but is on par with those of 1978/79 and 79/80. Scores at Whistler and Allison are down marginally from the previous years. The decline in scores was primarily caused by the increased snowfall this past winter. Dry periods were infrequent and relatively short-lived. See Figure 9 for a comparison of the recorded snow depths (in centimetres) at Grouse, Whistler, and Allison Pass over the past two winters. The difference is most graphic at Grouse. It is understandable that higher scores are achieved during drought periods than when complex precipitation events are occurring.

In any event, the results of the verification of snow amounts during the winter of 1981/82 confirms, once again, superiority of subjective forecasts over the objective guidance.

REFERENCES

- |               |             |   |
|---------------|-------------|---|
| Gigliotti, T. | PRTN 79-015 | Examination of the PWC Mountain<br>Forecast Program QPF.                    |
| Puss, V.      | PRTN 80-020 | Verification of the Forecast Snow<br>Amounts Over the South Coast Mountains |
| Puss, V.      | PRTN 81-015 | Snowfall Forecast Verification 1980/81<br>Over Southwestern B.C.            |

CONTINGENCY TABLES OF STATISTICAL GUIDANCE FORECAST OF  
PRECIPITATION AGAINST ACTUAL AMOUNTS  
1981/82

**FIG. 1 GROUSE**

	FORECAST					
ACTUAL	0	.1-10	11-20	21-50	>50	TOTAL
0	16	6	4	2		28
.1-10	7	13	7	16		43
11-20	3	4	7	9	1	24
21-50		1	2	3		6
>50		1				1
TOTAL	26	25	20	30	1	102

Hits 39 = 38%  
Near Miss 36 = 36%  
Miss 27 = 26%

**FIG. 2 WHISTLER**

	FORECAST					
ACTUAL	0	.1-10	11-20	21-50	>50	TOTAL
0	15	2	4	1		22
.1-10	7	17	20	7	4	55
11-20	1	6	7	6	2	22
21-50		2	1	4		7
>50						
TOTAL	23	27	32	18	6	106

Hits 43 = 40%  
Near Miss 42 = 40%  
Miss 21 = 20%

**FIG. 3 ALLISON**

	FORECAST					
ACTUAL	0	.1-10	11-20	21-50	>50	TOTAL
0	18	6	2	3	1	30
.1-10	8	17	16	15		56
11-20		7	5	6		18
21-50				4		4
>50						
TOTAL	26	30	23	28	1	108

Hits 44 = 41%  
Near Miss 43 = 40%  
Miss 21 = 19%

CONTINGENCY TABLES OF ISSUED FORECAST SNOW AMOUNTS  
AGAINST ACTUAL AMOUNTS  
1981/82

**FIG. 4 GROUSE**

	FORECAST					
ACTUAL	0	.1-10	11-20	21-50	>50	TOTAL
0	22	16				38
.1-10	2	38	6	1		47
11-20		9	10			19
21-50		4	3	1		8
>50		2	1			3
TOTAL	24	69	20	2		115

Hits 71 = 62%  
Near Miss 36 = 31%  
Miss 9 = 7%

**FIG. 5 WHISTLER**

	FORECAST					
ACTUAL	0	.1-10	11-20	21-50	>50	TOTAL
0	23	13				36
.1-10	2	43	8			53
11-20	2	7	9	1		19
21-50		4	4	1		9
>50			1			1
TOTAL	27	67	22	2		118

Hits 76 = 64%  
Near Miss 35 = 30%  
Miss 7 = 6%

**FIG. 6 ALLISON**

	FORECAST					
ACTUAL	0	.1-10	11-20	21-50	>50	TOTAL
0	18	13	4			35
.1-10	5	40	12	1		58
11-20		13	5			18
21-50		1	3	2		6
>50						
TOTAL	23	67	24	3		117

Hits 65 = 56%  
Near Miss 46 = 39%  
Miss 6 = 5%

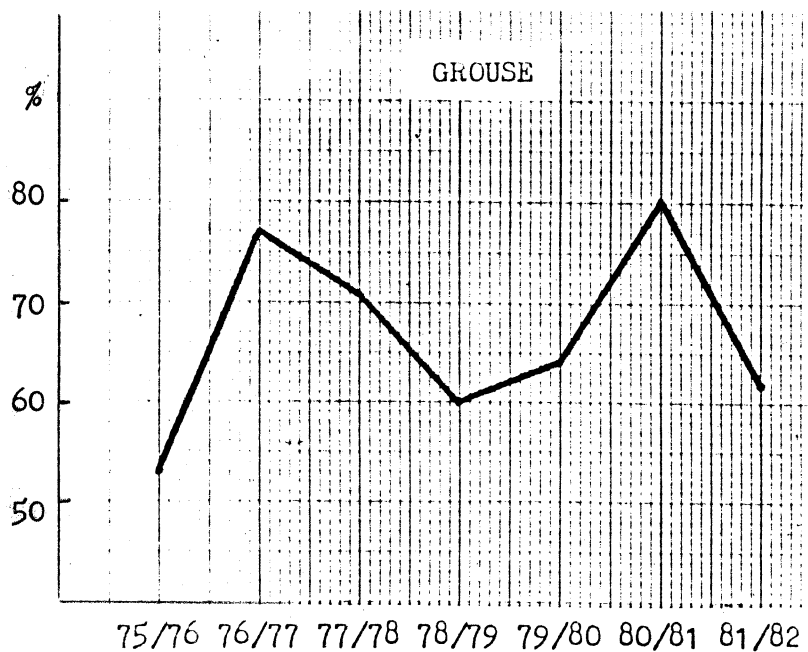


Figure 7.  
Percentage of "Hits" at  
Grouse Mountain over the  
past 7 winters.

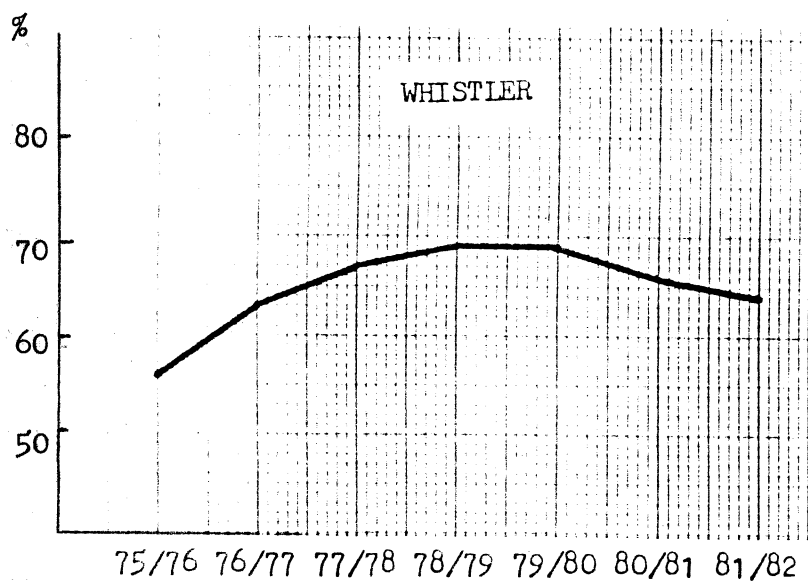


Figure 8.  
Percentage of "Hits" at  
Whistler over the past  
7 winters.

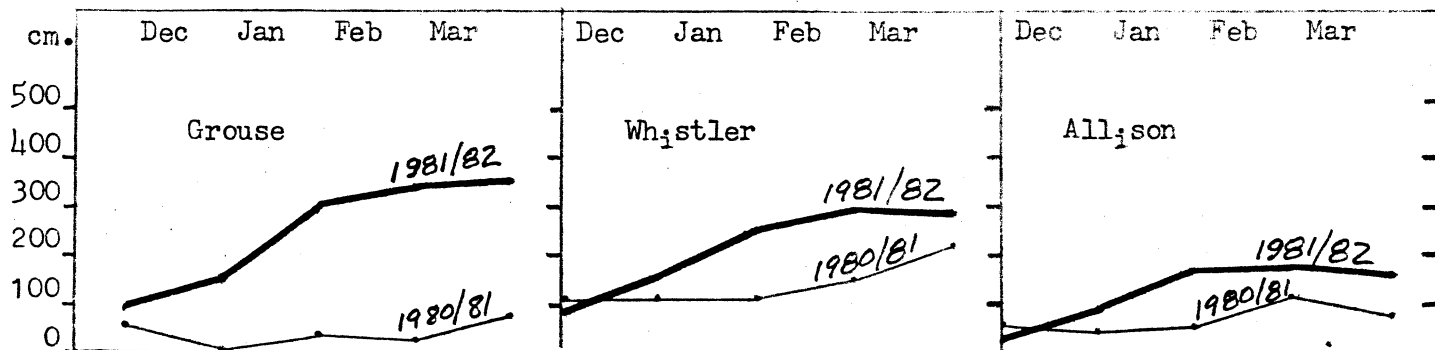


Figure 9. Depth of snow at the three sites during the past two winters.