



# PACIFIC REGION TECHNICAL NOTES

79-015

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EXAMINATION OF THE PWC MOUNTAIN FORECAST PROGRAM QPF

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## INTRODUCTION

The Mountain Forecast program consists of 2 forecasts per day covering 8 mountain regions. The prime forecast concern has been snow amounts along with a number of other pertinent parameters. The objective quantitative precipitation forecast (QPF) support has been provided by;

- a. CMC QPF output
- b. NWS QPF output (FOUS 76)
- c. FWC MDA numerical output for Rogers Pass
- d. Synoptic study for Rogers' Pass
- e. FWC statistical output for South Coast Mountain stations
- f. History

To examine the forecast method, a comparison was made of the actual forecast amounts against the FWC statistical guidance program output implemented in January of 1978 for the South Coast Mountains.

## METHOD

The actual forecast values of snowfall issued were based on all available numerical guidance, history, and the Meteorologists appraisal of the situation for the various regions.

The FWC statistical guidance derived for the South Coast Mountain stations were based on precipitation and predictor data for:

Grouse Mountain- since 1972  
Whistler Mountain- since 1973  
Allison Pass- since 1974

Numerous predictors were tested but the best were found to be thickness(1000mb- 500mb), 850mb. wind speed and 850mb. direction.

These predicted values of thickness, speed, and direction were inputted daily. The computer program screened the data base for each station and tabulated the percentage frequency occurrence at each station for 8 ranges of precipitation amounts. Percentages were displayed for the following categories;

0; .1-10; 11-20; 21-50; > 50 (m.m)

The category amount is a 24 hour value centered on the predictor forecast time ie. 12Z of the following morning.

The fixed range around the predictors are:

Thickness (H)- 3 decameters

Wind direction- 20 degrees

Wind speed- 5 knots

## RESULTS

1.- Figures 1 & 2 show contingency Tables of the statistical guidance forecasts for 1978/79 against the actual amounts for Grouse & Whistler respectively. Allison was not considered due to the sparsity of verifying reports.

- Figures 3 & 4 show contingency Tables of the issued forecast amounts (6 a.m. forecast) for 1978/79 against the actual snowfall for Grouse & Whistler respectively. In this case the verified period was the 24 hours from 8 a.m. ( just after time of issue) to 8 a.m. the following morning.

2. Figures 5& 6 show contingency Tables of the issued forecast amounts for 1977/78 against the actual snowfall for Grouse and Whistler respectively.

3. Figures 7 & 8 show contingency Tables of the issued forecast amounts for 1976/77 against the actual snowfall for Grouse and Whistler respectively.

4. Figures 9 & 10 show contingency Tables of the issued forecast amounts for 1975/76 against the actual snowfall for Grouse and Whistler respectively.

5. Figure 11 summarizes the categories for the four seasons 1975/76, 1976/77, 1977/78, & 1978/79.

**CONTINGENCY TABLES OF STATISTICAL GUIDANCE FORECAST  
AGAINST ACTUAL AMOUNTS  
1978/79**

**FIG. 1 GROUSE**

ACTUAL	FORECAST					TOTAL
	0	.1-10	11-20	21-50	>50	
0	22	8	2	2		34
.1-10	14	19	10	3		46
11-20		3	5	3		11
21-50			1	3	1	5
>50				1		
TOTAL	36	30	18	12	1	97

Hits - 16 i.e. 44.6%  
 Near Miss - 37 i.e. 35.9% (adjacent category)  
 Miss - 20 i.e. 19.6% (outside adjacent category)

**FIG. 2 WHISTLER**

ACTUAL	FORECAST					TOTAL
	0	.1-10	11-20	21-50	>50	
0	24	12	5	3		44
.1-10	7	15	11	11		44
11-20	1	2	2	3		8
21-50			2	5		7
>50						
TOTAL	32	29	20	22		103

Hits - 19 i.e. 50.5%  
 Near Miss - 41 i.e. 42.2%  
 Miss - 7 i.e. 7.2%

**CONTINGENCY TABLES OF ISSUED FORECAST VALUES  
AGAINST ACTUAL AMOUNTS  
1978/79**

**FIG. 3 GROUSE**

ACTUAL	FORECAST					TOTAL
	0	.1-10	11-20	21-50	>50	
0	43	8				51
.1-10	16	16	4	1		37
11-20	5	6	4			15
21-50	1	2				3
>50						
TOTAL	65	32	8	1		106

Hits - 63 i.e. 59.1%  
 Near Miss - 31 i.e. 32%  
 Miss - 9 i.e. 8.1%

**FIG. 4 WHISTLER**

ACTUAL	FORECAST					TOTAL
	0	.1-10	11-20	21-50	>50	
0	41	2	1			44
.1-10	14	21	5			40
11-20	1	3	3			7
21-50		2	2	1		5
>50						
TOTAL	56	28	11	1		96

Hits - 66 i.e. 68.7%  
 Near Miss - 26 i.e. 27.1%  
 Miss - 4 i.e. 4.1%

**CONTINGENCY TABLES OF ISSUED FORECAST VALUES  
AGAINST ACTUAL AMOUNTS**

**FIG.5 GROUSE  
1977/78**

ACTUAL	FORECAST					TOTAL
	0	.1-10	11-20	21-50	>50	
0	44	7	2			53
.1-10	3	17	3			23
11-20	2	3	1			6
21-50		4	1			5
>50						
TOTAL	49	31	7			87

Hits - 62 i.e. 71.2%  
Near Miss - 17 i.e. 19.5%  
Misses - 8 i.e. 9.2%

**FIG.6 WHISTLER  
1977/78**

ACTUAL	FORECAST					TOTAL
	0	.1-10	11-20	21-50	>50	
0	40	6				46
.1-10	11	24	4			39
11-20	1	8	6			15
21-50		1	2			3
>50		1				1
TOTAL	52	40	12			104

Hits - 70 i.e. 67.3%  
Near Miss - 31 i.e. 29.8%  
Misses - 3 i.e. 2.8%

**FIG.7 GROUSE  
1976/77**

ACTUAL	FORECAST					TOTAL
	0	.1-10	11-20	21-50	>50	
0	75	7	3			85
.1-10	9	11	2			22
11-20	2	3	2			7
21-50						
>50						
TOTAL	86	21	7			114

Hits - 88 i.e. 77.2%  
Near Miss - 21 i.e. 18.4%  
Misses - 5 i.e. 4.3%

**FIG.8 WHISTLER  
1976/77**

ACTUAL	FORECAST					TOTAL
	0	.1-10	11-20	21-50	>50	
0	44	10	1			55
.1-10	11	13	2			26
11-20	1	4				5
21-50			4			4
>50						
TOTAL	56	27	7			90

Near Miss - 31 i.e. 34.4%  
Misses - 2 i.e. 2.2%

CONTINGENCY TABLES OF ISSUED FORECAST VALUES  
AGAINST ACTUAL AMOUNTS  
1975 / 76

		FIG. 9 GROUSE				
		FORECAST				
ACTUAL	0	.1 - 10	11 - 20	21 - 50	>50	TOTAL
0	32	15	3			50
.1 - 10		16	8			24
11 - 20	2	9	6	1		18
21 - 50		4	2	2		8
>50						
TOTAL	34	44	19	3		100

Hits - 56 i.e. 56%  
Near Miss - 35 i.e. 35%  
Misses - 9 i.e. 9%

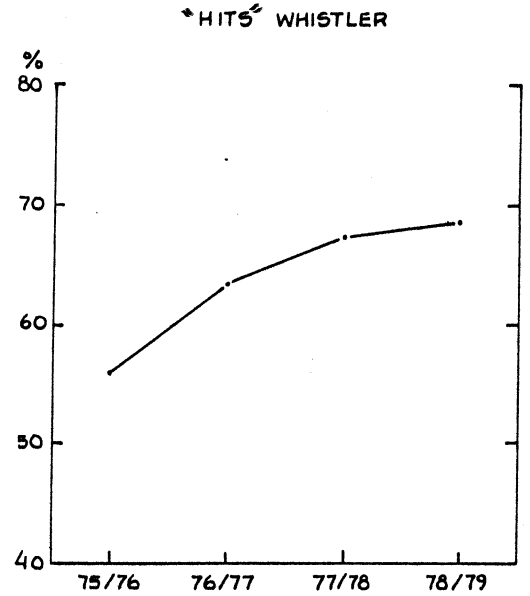
		FIG. 10 WHISTLER				
		FORECAST				
ACTUAL	0	.1 - 10	11 - 20	21 - 50	>50	TOTAL
0	32	11	2	1		46
.1 - 10	9	27	12			48
11 - 20	2	9	5			16
21 - 50	1	3	6	1		11
>50				2		2
TOTAL	44	50	25	4		123

Hits - 65 i.e. 52.8%  
Near Miss - 49 i.e. 40.0%  
Misses - 9 i.e. 7.2%

WHISTLER

FORECAST VALUES VS ACTUALS BY YEAR

	75/76	76/77	77/78	78/79
HITS	56%	63.3%	67.3%	68.7%
NEAR MISSES	40%	34.4%	29.8%	27.1%
MISSES	7.2%	2.2%	2.8%	4.1%



GROUSE

FORECAST VALUES VS ACTUALS BY YEAR

	75/76	76/77	77/78	78/79
HITS	52.8%	77.2%	71.2%	59.4%
NEAR MISSES	35%	18.4%	19.5%	32.0%
MISSES	9%	4.3%	9.2%	9.0%

