PACIFIC REGION TECHNICAL NOTES

79-037

December 13, 1979

NON-FORECAST OF RAIN OVER SOUTHWESTERN B.C. DECEMBER 5, 1979
(Forecast Investigation #2)

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INTRODUCTION

On the morning of December 4, 1979 the Pacific Weather Centre issued a public forecast for the Lower mainland area calling for a gradual clearing to mostly sunny skies and only cloudy periods for the following day. By the morning of December 5, the lower mainland was under overcast clouds with periods of rain covering the entire length of the coast. This report will investigate the development of the weather pattern over the area in question with a view of finding a plausible explanation for the poor forecast for December 4 and 5.

THE INITIAL SYNOPTIC SITUATION

Figures 1, 2 and 3a show the 500mb chart, surface chart and satellite photos available to the forecaster at forecast time. The 500mb chart has a north-south oriented trough off the west coast near longitude 137 with a strong southwest flow aloft over the south coast. A shortwave ridge to the west of the trough was followed by a strong southwest flow over the Aleutians. The surface chart (Figure 2) indicated quite an active frontal wave passing through the south coast resulting in "generous" amounts of precipitation over southern B.C. A second frontal wave was approaching from the west just south of Alaska. Between these systems a ridge appears to be building with one ship reporting a rise of 4.6mb in 3 hours. The satellite picture (Figure 3a) for 0615Z shows the large area of high and middle cloud associated with the frontal system on the south coast. This is followed by an area approximately 600 miles wide to the north-west which is relatively free of any high and middle clouds. Northwest of this clear area an organized cloud system associated with the second frontal wave can be seen.

DISCUSSION OF THE PROGS

1. The last FX issued by the Duty Prog Analyst at the time of the forecast indicated he felt all the numerical progs were in good agreement, but felt the LFM was best.

2. The PE and spectral progs forecast almost the same 500mb, moisture and precipitation patterns.

3. The LFM 500mb prognosis for December 5 at 12Z (Figure 4) shows the upper trough weakened over the eastern Prairies. Western Canada is shown under a wide band of strong north-westerlies with a small shortwave trough over Vancouver and a second through the Alaskan Peninsula.

4. The surface prog (Figure 7) indicated a low just south of Alaska and a high pressure area over the far northwest U.S. leaving Vancouver in a southwesterly flow at the surface.

5. The LFM moisture and precipitation progs revealed more of the possible weather expected for the lower mainland. The 12Z prog for December 5 (Figure 5) shows the precipitation north of Vancouver Island with positive vertical velocity south to near Seattle. The 00Z prog for December 6 (Figure 6) was even more pessimistic for the afternoon. It shows an area of precipitation covering the entire province of B.C.

6. Using these progs as guidance it would be too optimistic to expect sunny skies for most of December 5. There were no positive indications of good weather. The progs however do give good reasons for at least a cloudy day, especially if all progs agree and the forecaster feels they are reasonable.

7. Figure 8 shows the PWC surface prognosis for December 5/12Z produced by the PWC duty prognostician. It indicates he felt the frontal wave south of Alaska would continue to push eastward into central Alberta keeping the cloud and precipitation north of the lower mainland, the southern edge of the cloud band on his prog chart actually agrees quite well with the LFM precipitation pattern.

THE WEATHER ON DECEMBER 5

Figure 9 shows the 500mb analysis for December 5, 12Z and Figure 10 shows the actual surface analysis for the same time. A comparison with Figure 4 (500mb LFM progs) shows the LFM prog was quite good. The contours are a little higher than forecast and it is difficult to find a significant shortwave near Vancouver, and only a small shortwave is evident just north of the Charlottes. The general flow pattern however fits very well, with a strong northwest flow over the west.

The actual surface chart (Figure 10) however, shows a major difference. Instead of moving east into central Alberta, the initial frontal wave moved down the coast under the north west flow aloft. By December 5/12Z (the time of the other surface chart) cloud and rain had spread to all but the far southeast corner of B.C.

Figure 3 shows the weather sequence on the satellite pictures. Figure 3b shows the cloud associated with the initial wave has moved east just touching the northern Charlottes by December 4/12Z. Notice that the cloud band which extended from the comma head to south of 50 N at 16Z has dissipated giving the forecaster the possible impression that the system was weakening and would head west towards the Alaskan Panhandle.

Figure 3c shows the satellite IR picture for December 5/12Z. This picture shows the entire cloud ribbon which extended across the North Pacific has moved south and the cloud associated with the shortwave has moved south east instead of east.

POSSIBLE CONCLUSIONS

1. Given the synoptic situation and a set of progs which indicated a deterioration in the weather for the day of December 5, the forecast could be considered highly optimistic for the month of December.

2. In forecasting sunny skies for the Fall and Winter months it would probably be wiser for the forecaster to look for a strong synoptic situation that would normally give sunny weather, rather than assume that no significant weather feature at 500mb implies good weather.

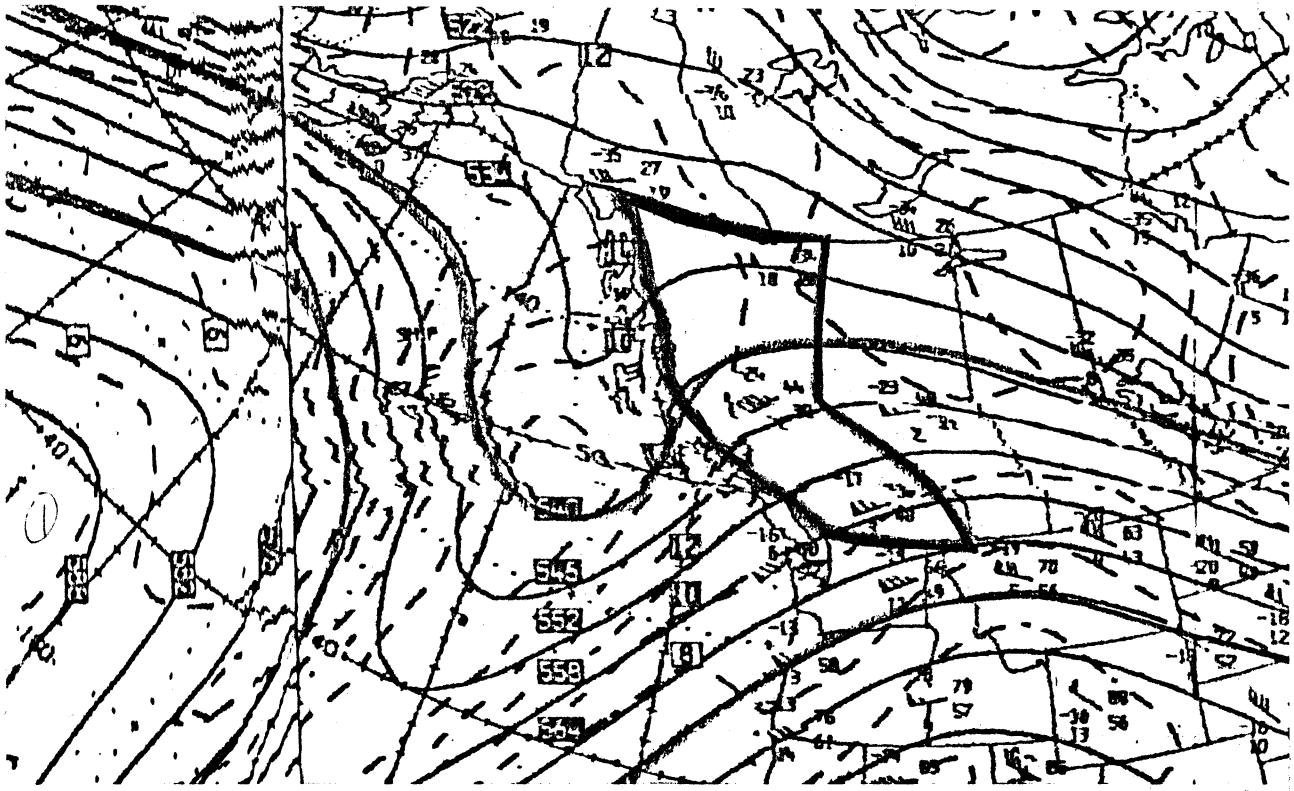

FIGURE 1. CMC 500mb analysis valid 00Z December 4, 1979.

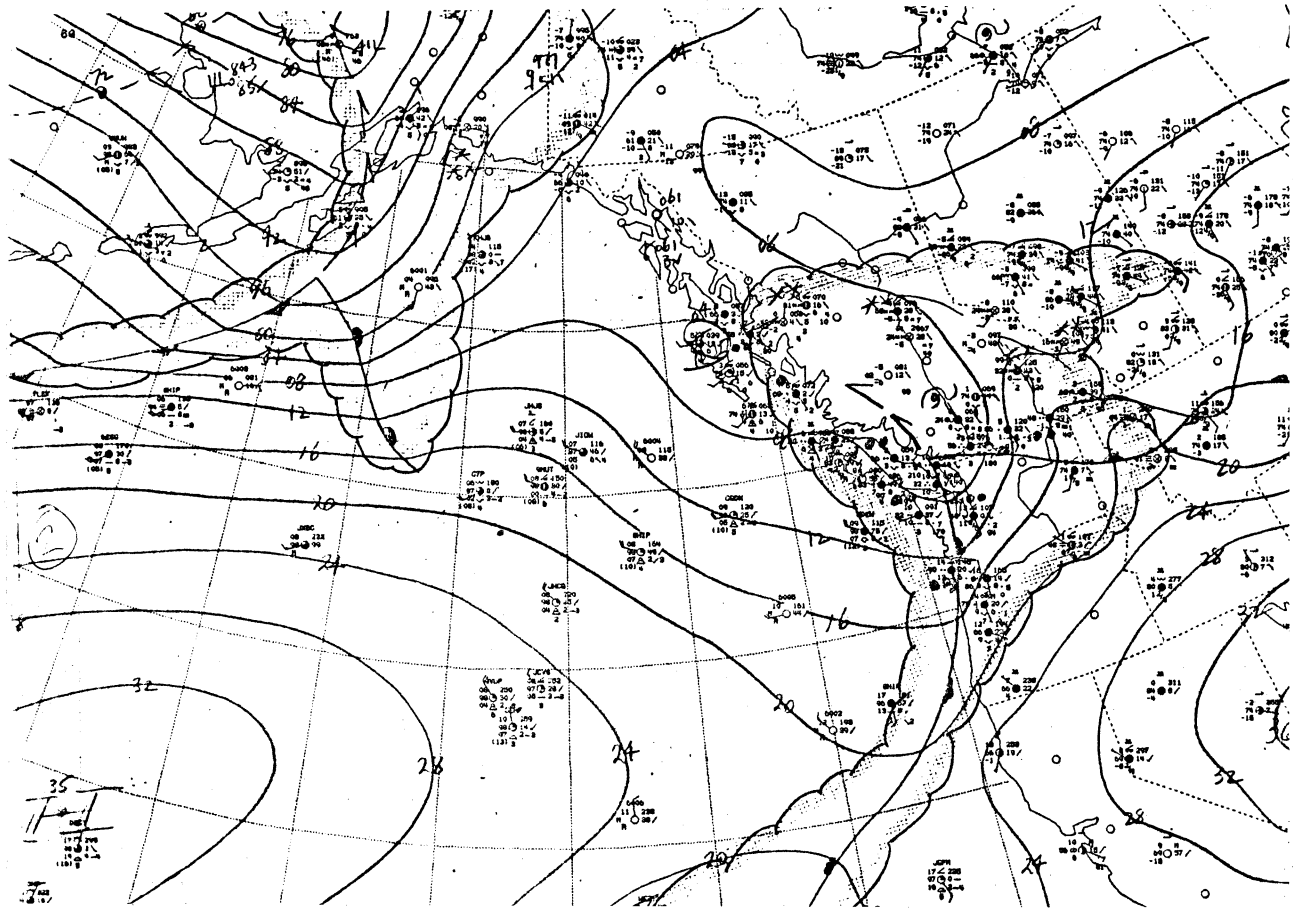

FIGURE 2. PWC surface analysis valid 06Z December 4, 1979.

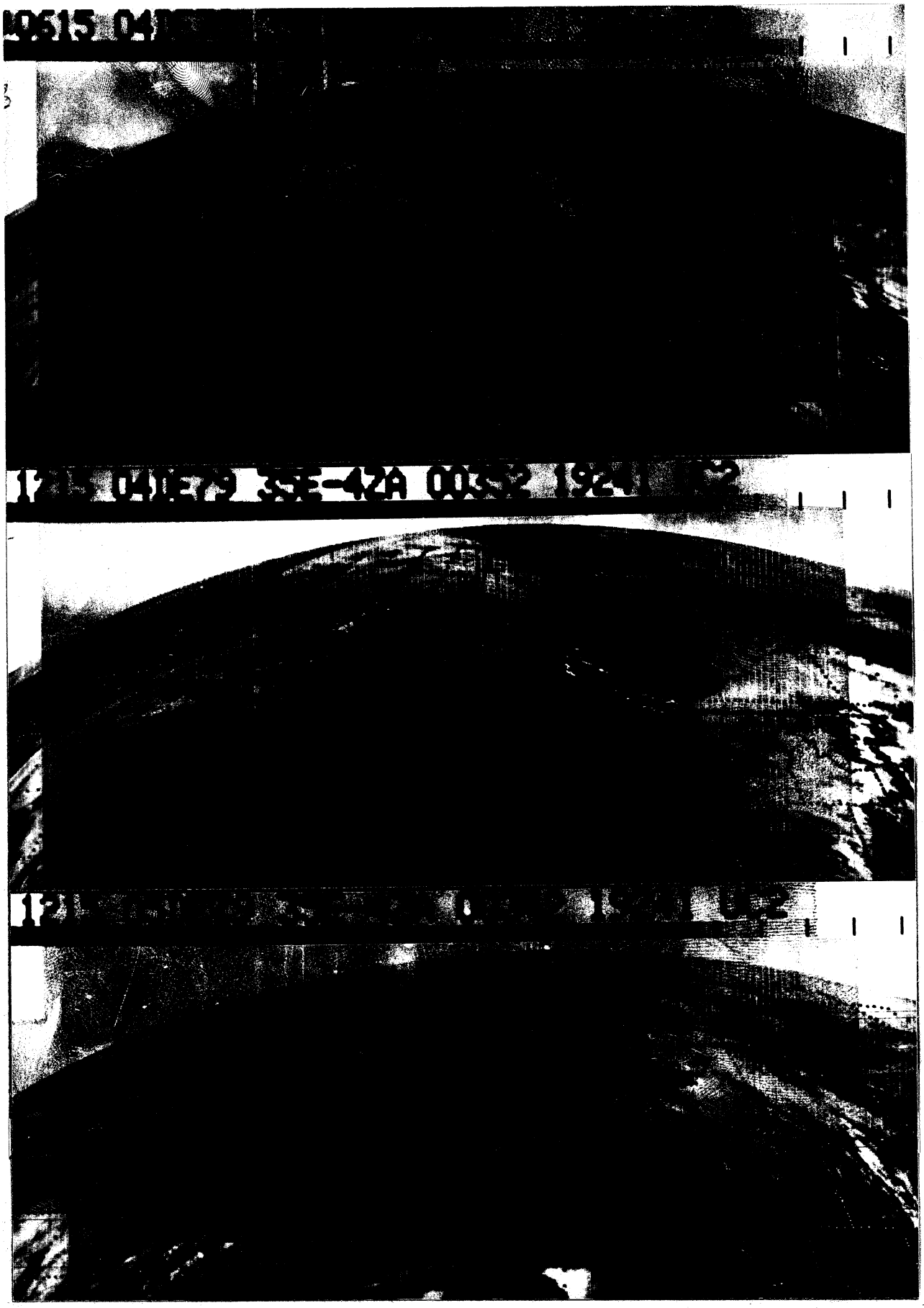

FIGURE 3. *Satellite IR -images valid (a) 0615Z Dec04 (b) 1215Z Dec04 (c) 1215Z Dec05*

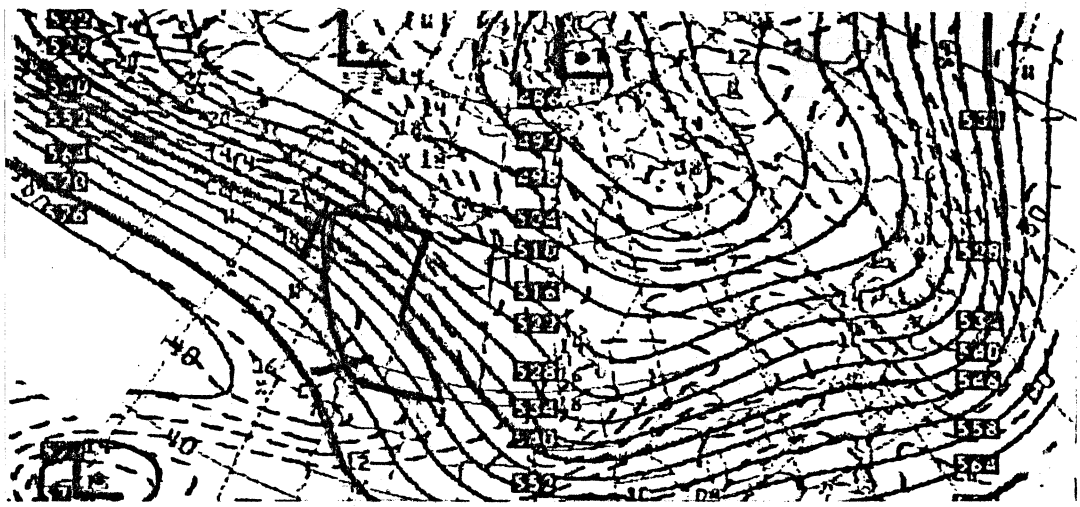

FIGURE 4. LFM 36HR 500MB prognosis

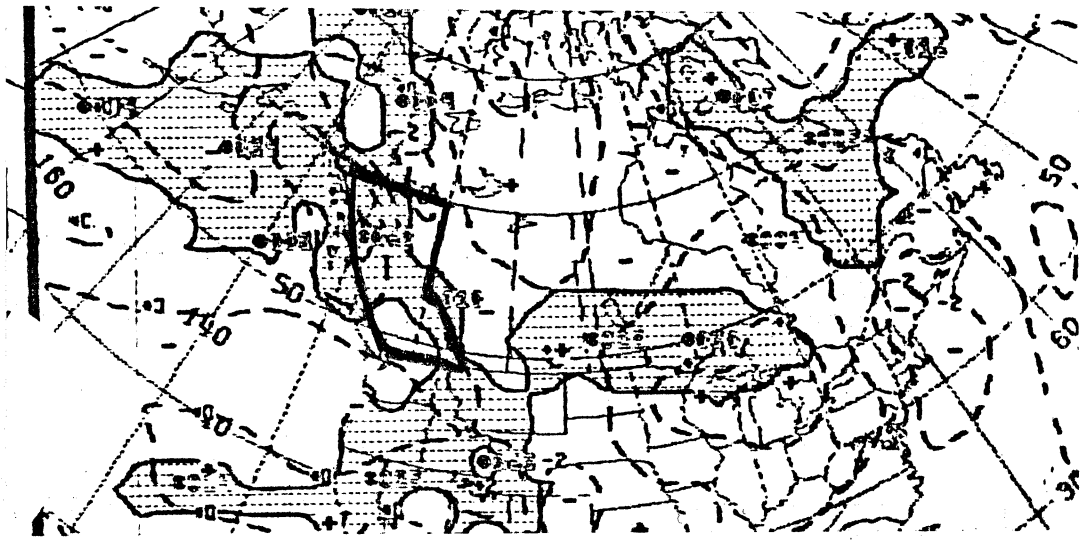

FIGURE 5. LFM 36HR precipitation and vertical velocity prognosis.

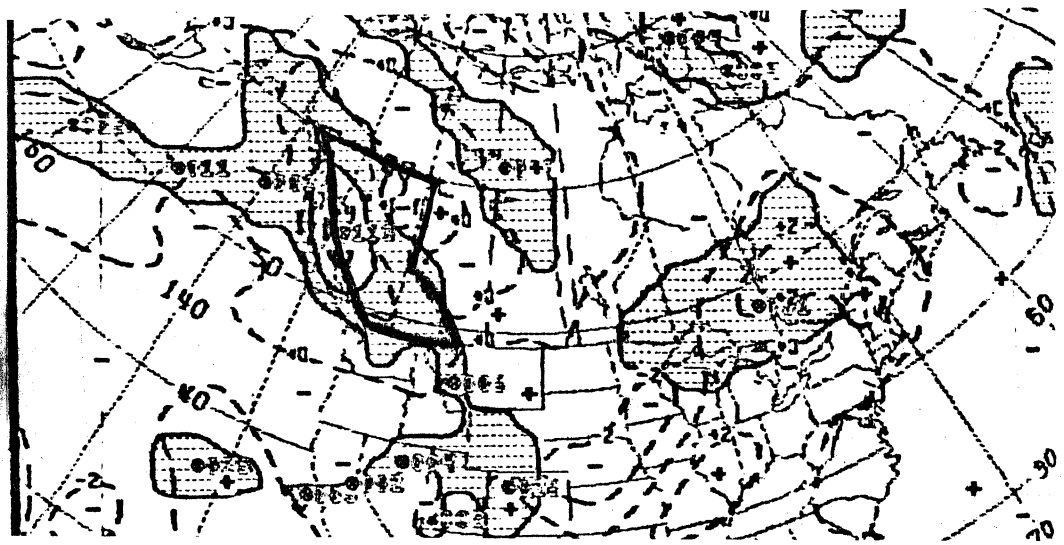

FIGURE 6. LFM 48HR precipitation and vertical velocity prognosis

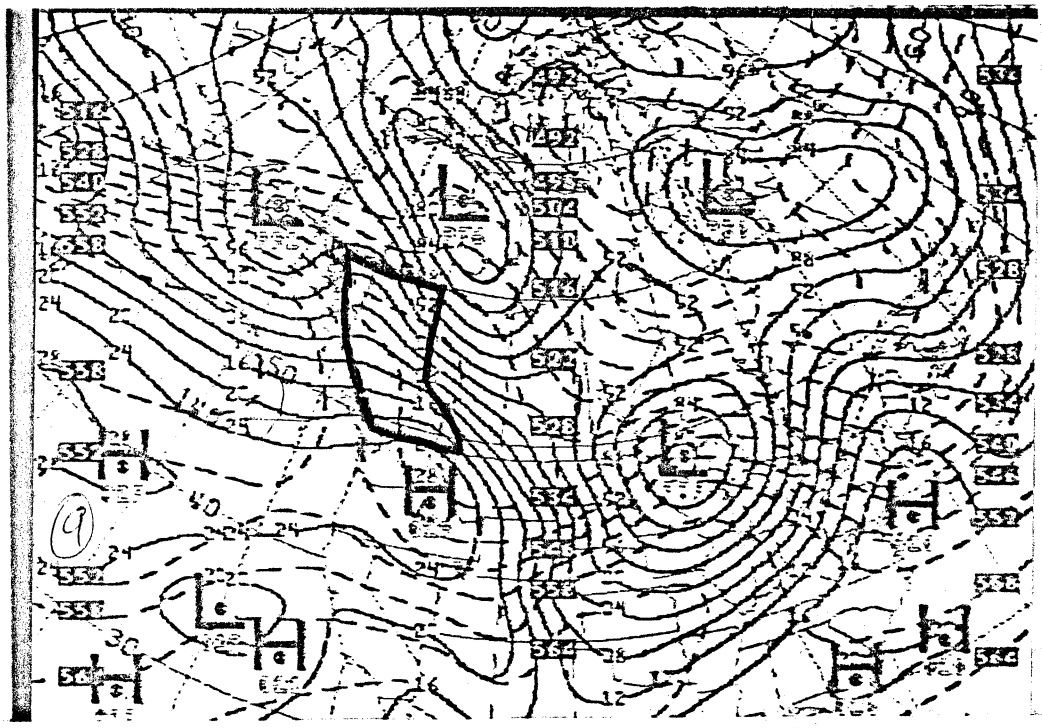

FIGURE 7. *LFM 36HR surface MSL prognosis*

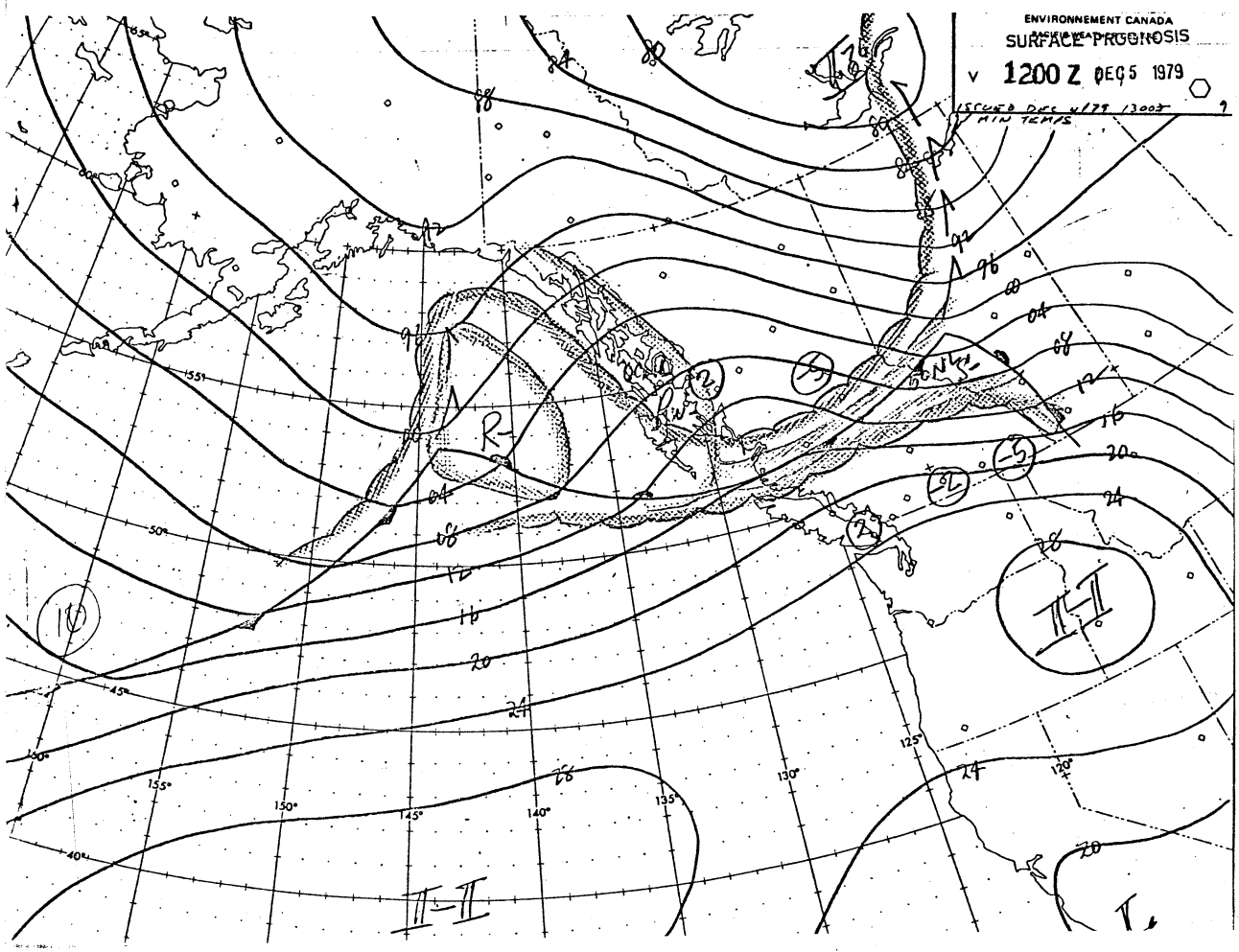

FIGURE 8. *PWC 36HR Surface prognosis*

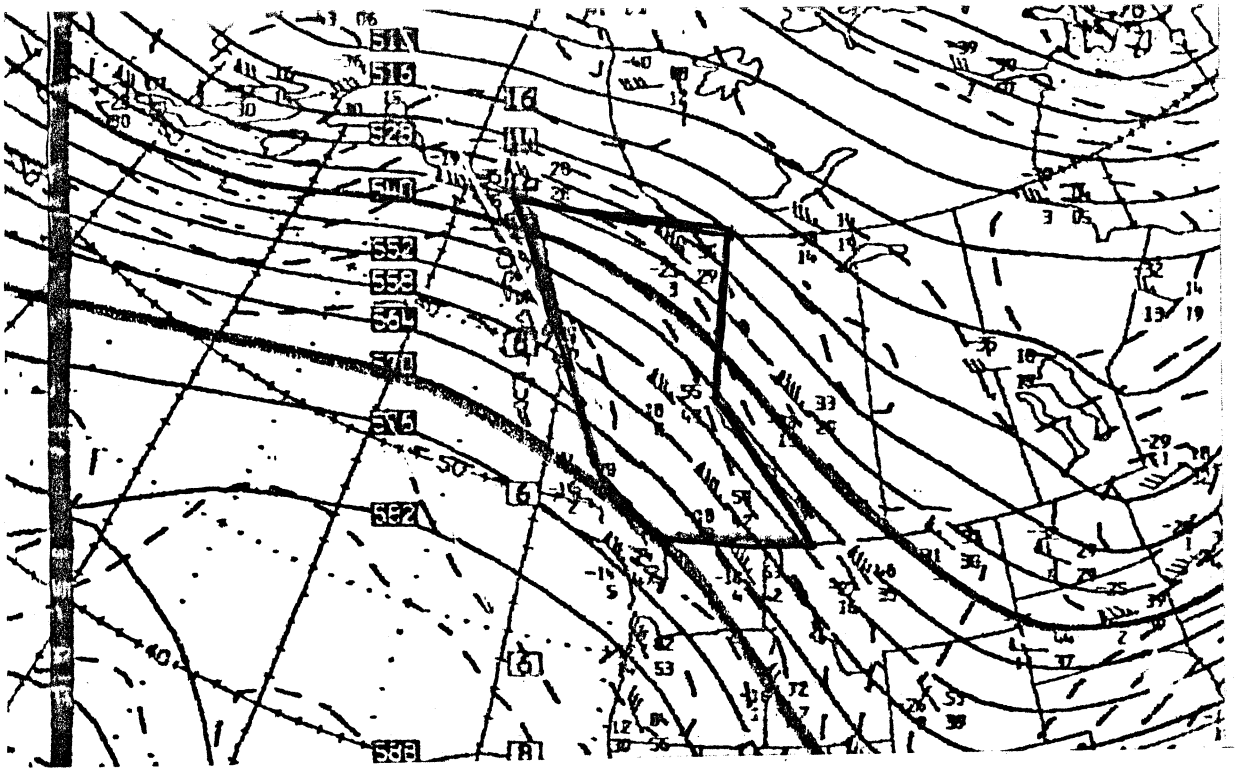

FIGURE 9. CMC 500MB analysis valid 12Z December 5, 1979.

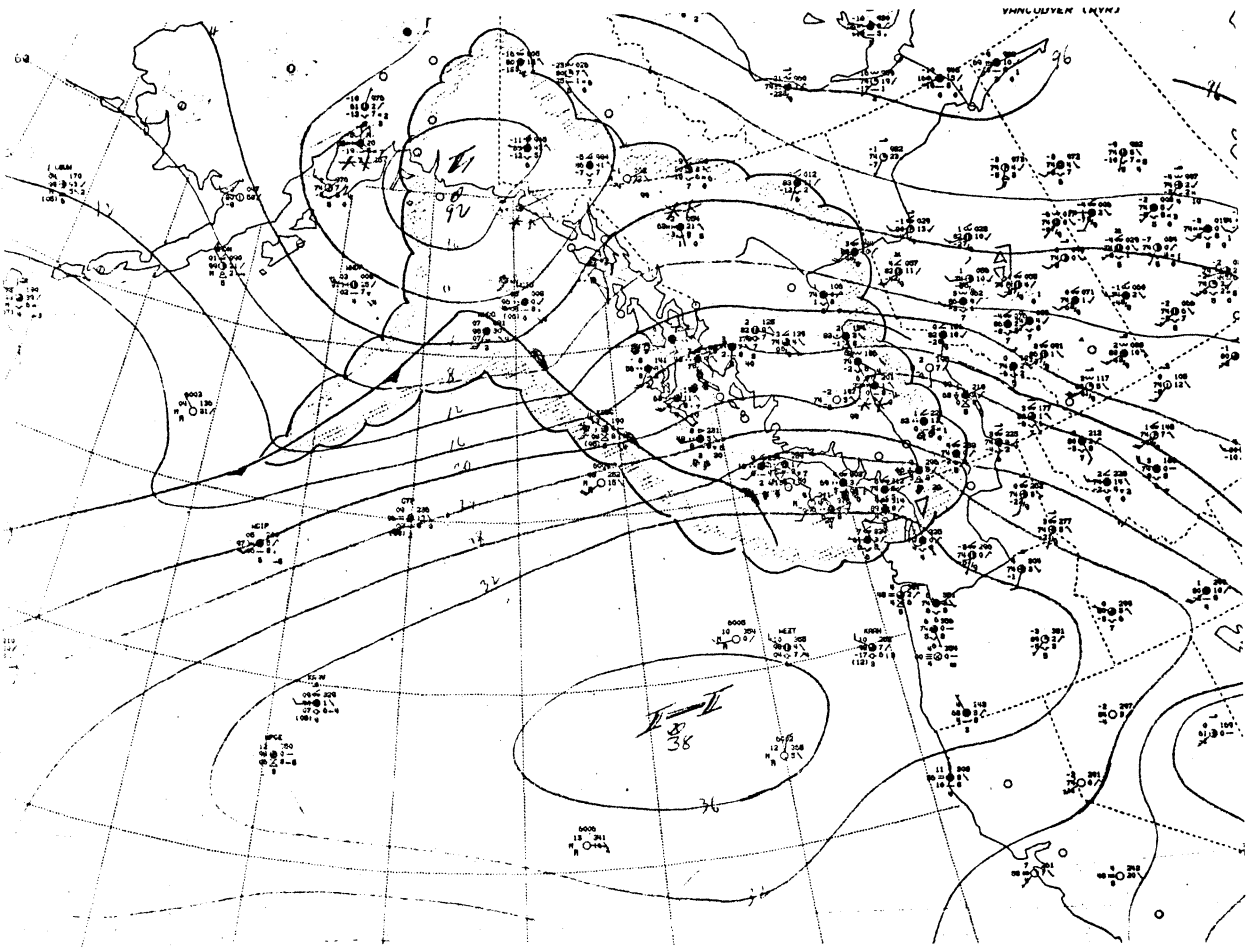

FIGURE 10. PWC surface analysis valid 12Z December 5, 1979.