



PACIFIC REGION TECHNICAL NOTES

No.-78-027

July 26, 1978

THE EFFECT OF ANALYSES ON SUBSEQUENT PROGNOSSES CONT..

1. UPPER LEVEL FLOW PATTERNS
2. THE CUT-OFF LOW

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DISCUSSION.

The following charts or copies of satellite imagery are attached:

1. Initial 500 mb. analysis for June 13, 0000Z, 1978.
2. 36 hour prog made off June 13, 0000Z analysis and valid for June 14, 1200Z, 1978.
3. Initial 500 mb. analysis for June 14, 1200Z, 1978.
4. Enhanced satellite imagery valid 0015Z, June 13, 1978.
5. Enhanced satellite imagery valid 1215Z, June 14, 1978.

No attempt was made to alter the initial analyses. Some vorticity trofs which are marked on the charts were placed there by the duty forecaster.

A. THE EFFECT OF AN INCORRECT CIRCULATION PATTERN.

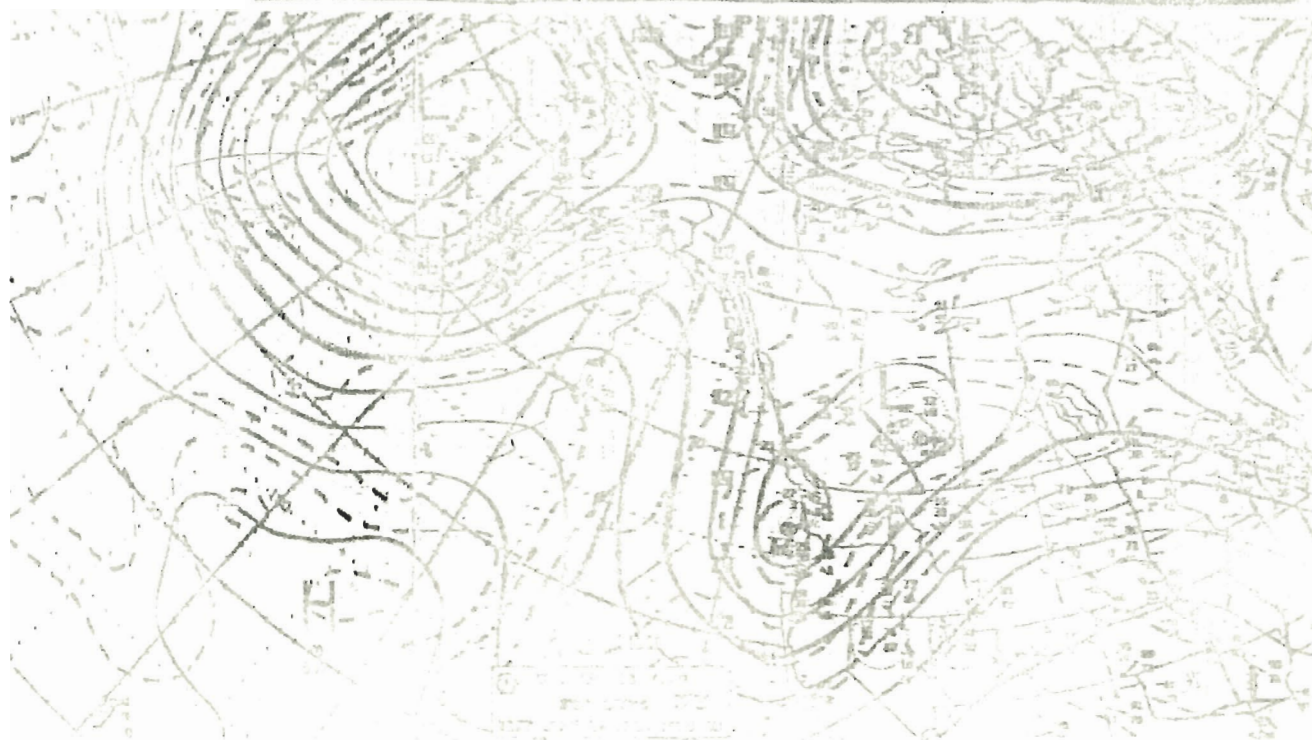
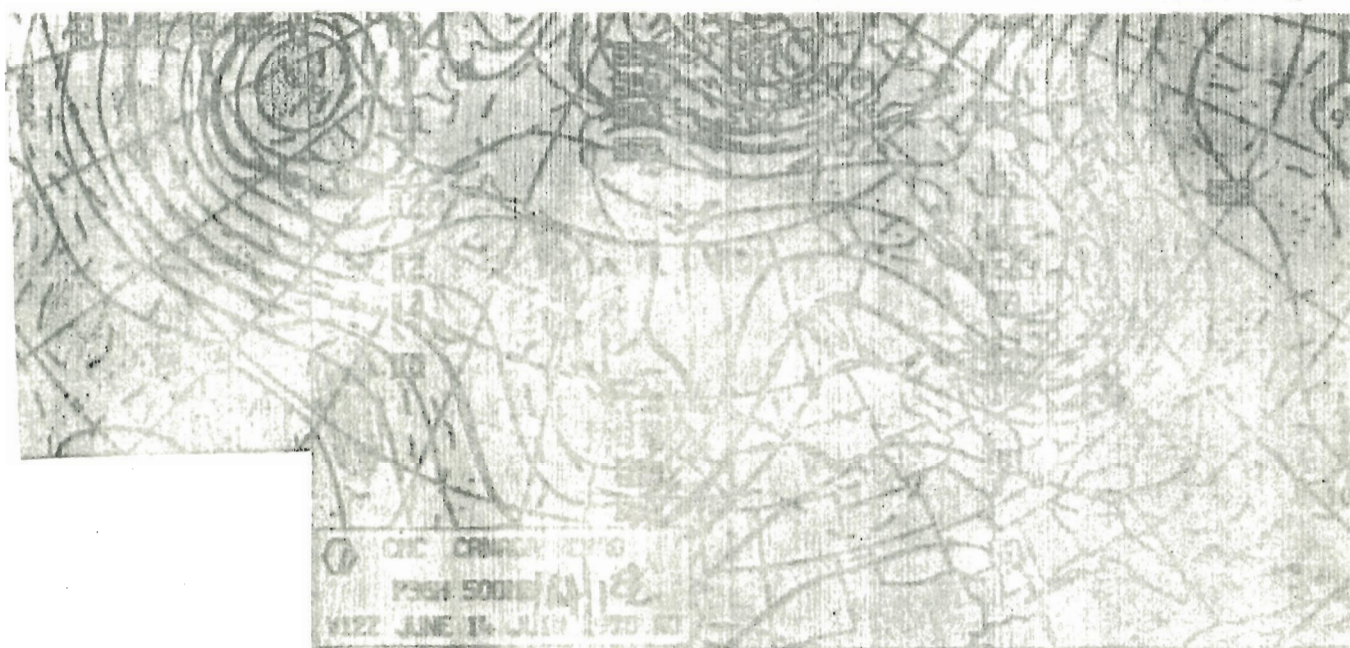
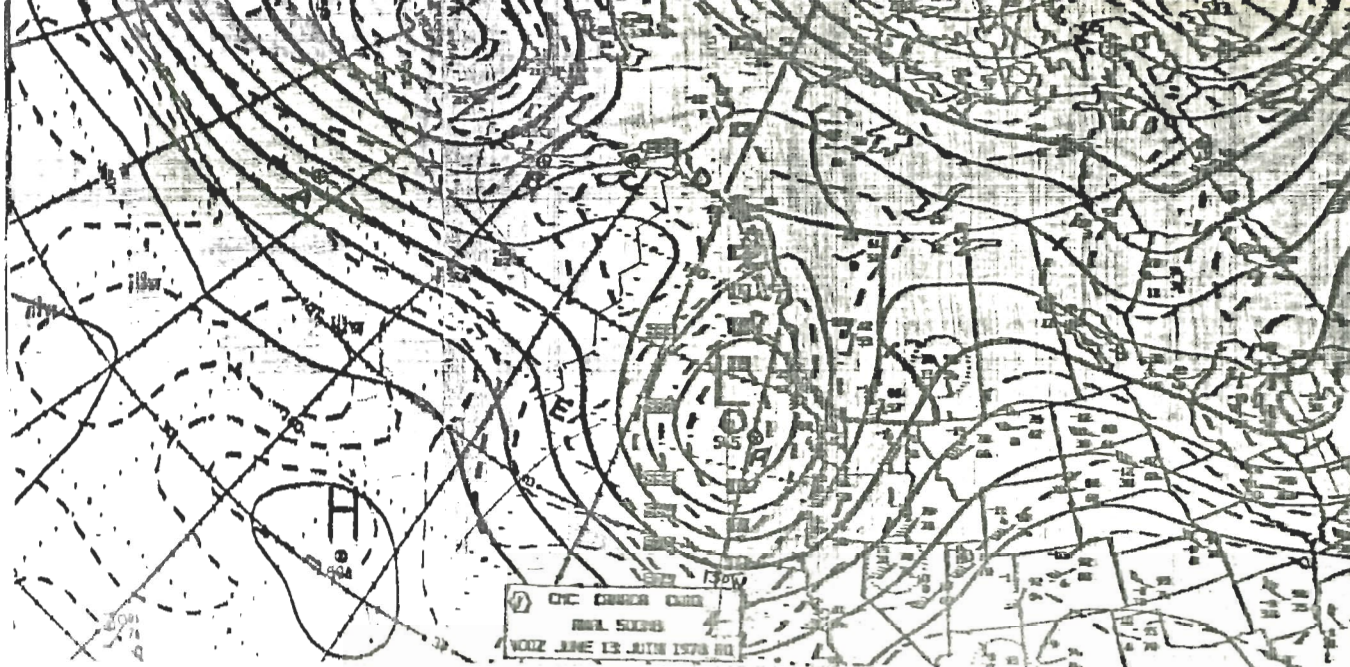
The satellite imagery for 0015Z, June 13 shows that the high level circulation from A to B to C is basically anticyclonic with a strong ridge extending from D to E, and likely a wind maximum at position C. To the southeast of B some colder cloud tops hint at a weak trof or positive vorticity advection area near that region. The initial analysis shows basically a cyclonic circulation from A to B to C with no evidence of a wind maximum at C. The ridge line is in about the correct position, but too much flow is indicated in a west to east direction between 40N and 50N and 150W to 160W. Based upon this initial analysis the resulting prognosis continued to forecast a strong flow south of 50N and west of 145W. This produced an underforecast of heights at the 500 mb. level of 6 to 10 dkm. in the Gulf of Alaska within 36 hours.

It would appear that if an initial analysis shows a major circulation pattern that is cyclonic, when in fact it should be anticyclonic, then the prognosis downstream from this feature will likely err by underforecasting the heights at the 500 mb. level.

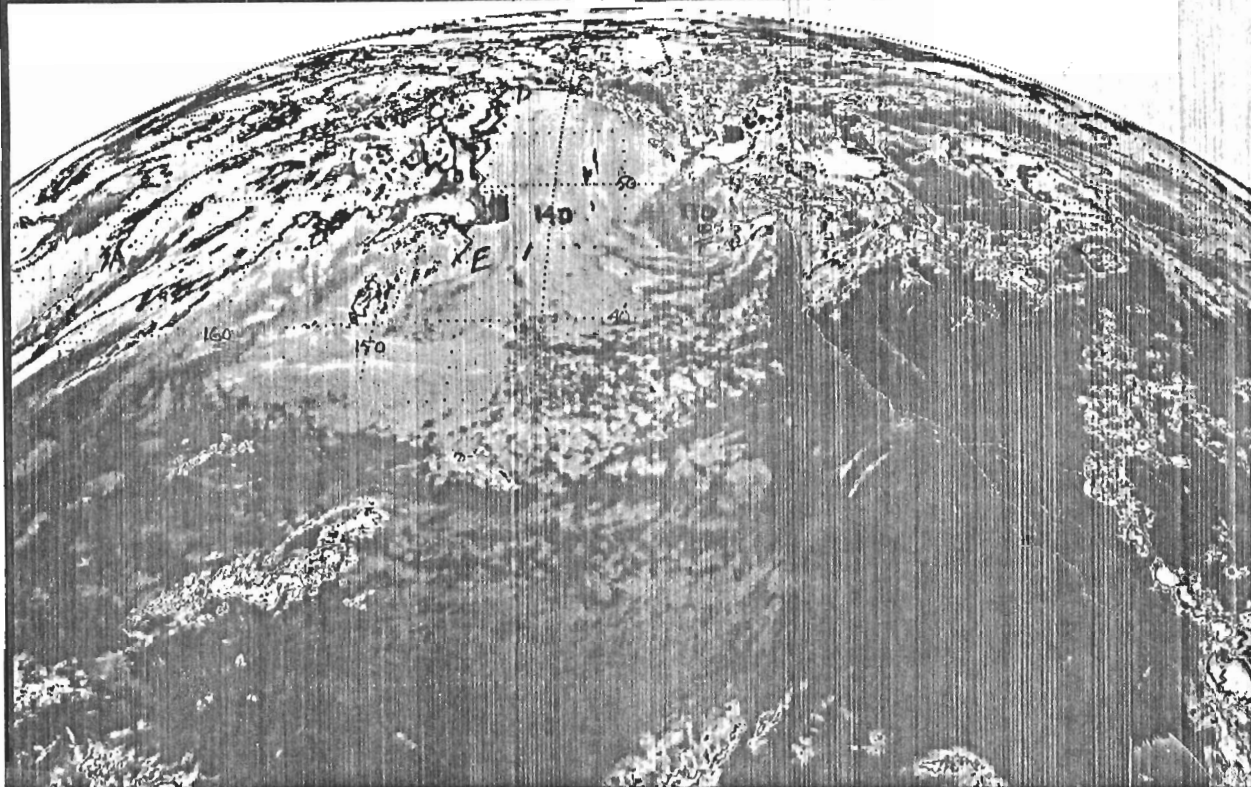
B. THE DILEMMA OF THE CUT-OFF LOW.

The satellite imagery for 0015Z, June 13 shows a vorticity center located near 47N 130W. This position fits well with that shown on the 500 mb. analysis for 0000Z, June 13 (position F). However, the cloud structures associated with this system over central and southeastern B.C. are quite complex, and could not be easily associated with the vorticity advection areas on the analysis. Also, along the Oregon coast the analysis shows probably the best positive vorticity advection area associated with this cut-off low. The imagery, on the other hand reveals a cloud free area along the Oregon coast with most of the PVA clouds well into Washington and Oregon. Furthermore, the trof shown to the southwest of the low on the analysis is probably spurious since only stable, low clouds are shown on the imagery in that position. The prognosis resulting from this analysis shows one vorticity center over extreme southwestern B.C. with no signifigant PVA area. The verifying analysis shows two distinct vorticity centers; one off the coast of Washington, the other in south-central Alberta. The satellite imagery confirms these two positions (marked H and I), but quite likely there is also another vorticity center just northeast of northern Vancouver Island. Also, while the clouds associated with the center off the Washington coast are mostly convective in character, the clouds through central B.C. and to the north of Vancouver Island are associated with PVA. The complexity of the cloud structures associated with a cold-low as seen on satellite imagery is self-evident.

It would appear that the forecasting of cloud and precipitation patterns associated with cold-lows in the short to medium time span has yet to be solved; and that computer products which attempt to predict these events are as yet very unreliable. It should be pointed out however, that in most instances computer products will give a good central position of a cut-off low during the time span of 12 to 24 hours.



0015 13JN00 33E-2EC 00341 19301 UC2



1215 14JN78 33E-2EC 00331 19251 UC2

