

WESTERN REGION TECHNICAL ATTACHMENT NO. 88-25 July 19, 1988

NOT THIS TIME! WHAT HAPPENED? George R. Miller, WSFO Portland

Frequently after a case study of a storm is completed, many years may go by before a similar storm occurs. Thus, the argument can be made that case studies offer very little to the forecaster in the way of diagnosis and final input to the forecast.

However, over the July 4th weekend, almost identical conditions were present in the northeast Pacific when compared with the July 4th weekend in 1986. (See Western Region Technical Attachment No. 86-28.)

When the 1200Z 500mb chart of July 2, 1988 (Figure A1) is compared with the 1200Z 500mb chart of July 3, 1986 (Figure 2b), almost identical conditions exist. There is a cold low in the vicinity of the Queen Charlotte Islands. The 500mb temperature at Annette Island (labeled ANN in Figure A1 (b)) was measured at -30.5C (in 1986 Port Hardy, B.C. had -29C). There is also a weak block over Alaska.

What about the temperature at Annette Island at 500mb? Does it look correct? After all, at 0000Z on the 2nd, it was -25C, and at 0000 on the 3rd, it was also -25C. An Error perhaps? Not likely. The plotted sounding for 1200Z on the 2nd (Figure A2) shows slight cooling at 700mb, and 5 degrees cooling at 500mb. The whereabouts of that cold air, however, is a mystery. Where did it come from, and where did it go?

At the surface (Figure A3) a high pressure area was centered west of San Francisco with a portion extending northward along 145W. There was also a weak trough approaching the coast. No strong development is evident in satellite imagery off the Pacific Northwest coast (Figure A4).

In July of 1986, these conditions produced rapid surface deepening west of the Oregon coast that resulted in damaging surface winds as the low moved on shore (see Figure 4a and 5). However, in the 1988 case, no low developed, no damaging winds occurred, and hardly any rain fell in the Pacific Northwest. What happened?

The first clue is the absence of a very strong jet stream. In the July 1986 case, a jet in excess of 130 knots was approaching the Pacific Northwest (Figure 3). At 0000Z on July 3, 1988, the maximum value of the jet was only slightly more than 70 knots (Figure A5). Somewhat stronger winds (90 knots) were present over Washington and southern British Columbia.

One other ingredient was missing. In the 1986 case, rapid deepening was occurring at the surface west of 150W, which was producing a substantial ridge ahead of it. The 1988 case shows a relatively weak occlusion south of the Aleutians (Figure A3). No deepening, no ridge, nothing to translate downstream.

A cook cannot bake a good cake or pie and leave out one or two of the ingredients. "Mother Nature" had left out a couple of the prime factors. Thus, there was no storm.

This shows that meteorologists who have case histories to refer to are in a better position to make a correct forecast than those who rely on memory alone.

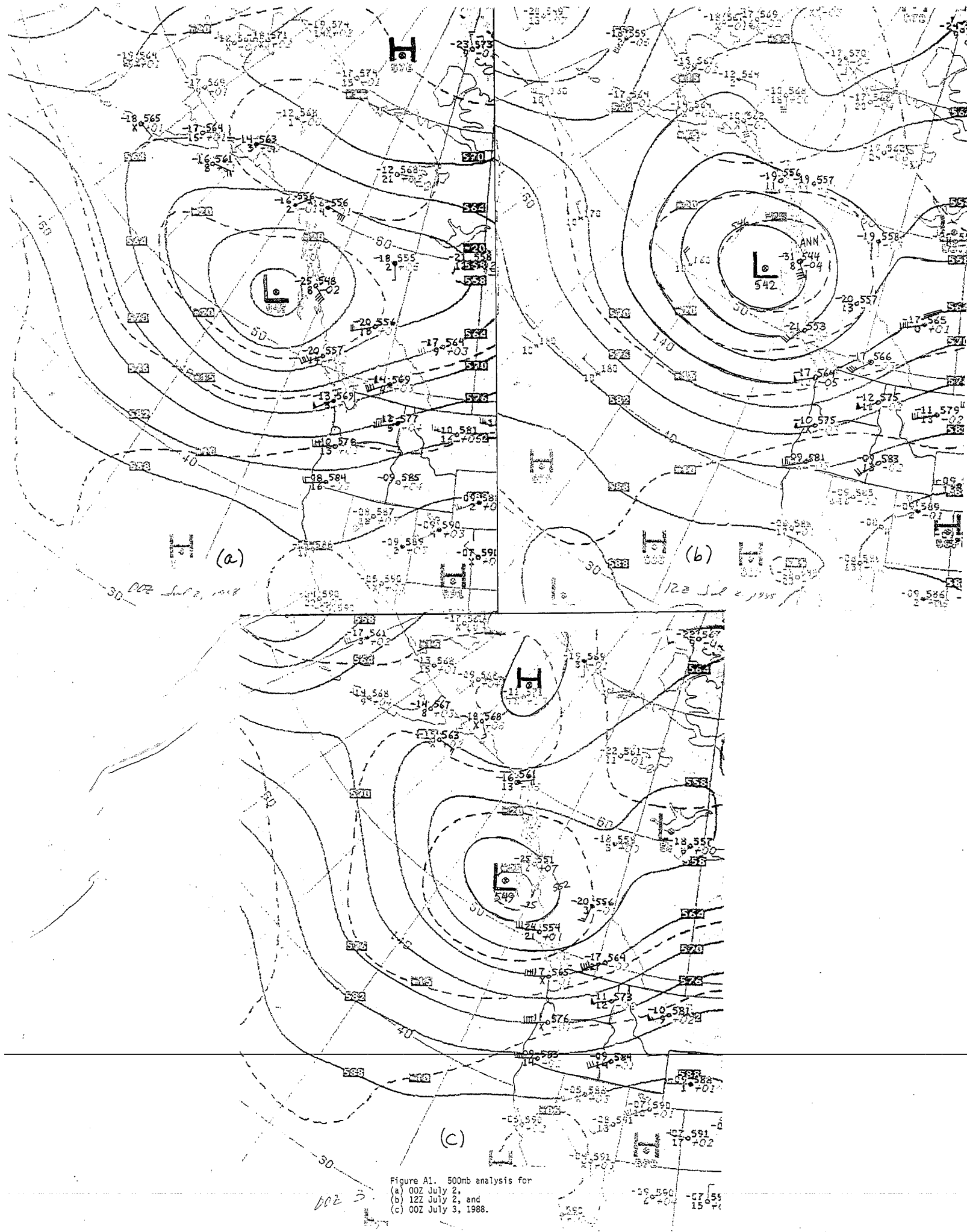
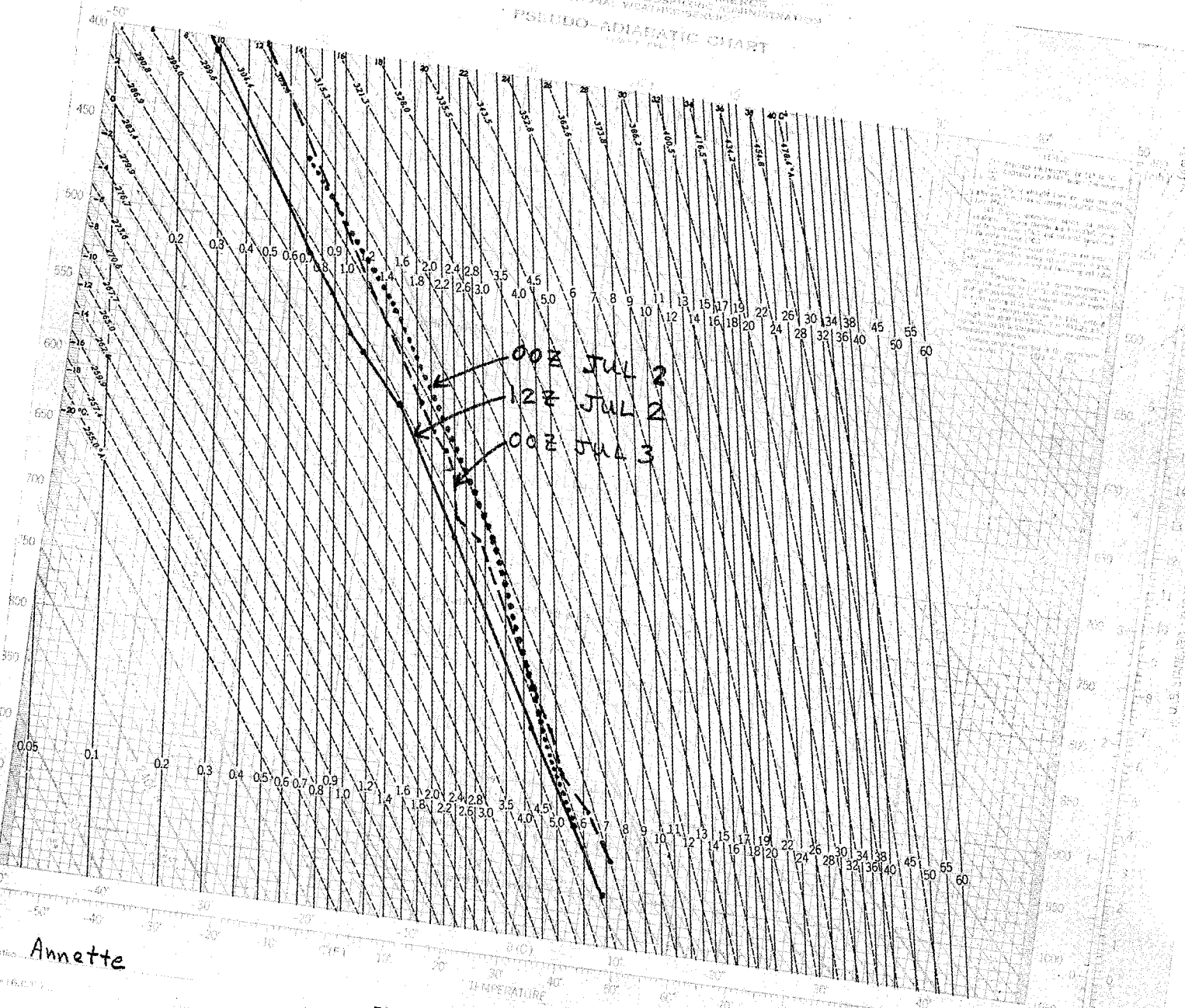


Figure A1. 500mb analysis for
 (a) 00Z July 2,
 (b) 12Z July 2, and
 (c) 00Z July 3, 1988.

PSEUDO-ADIABATIC CHART



Annette

Figure A2. Temperature soundings at Annette Island.

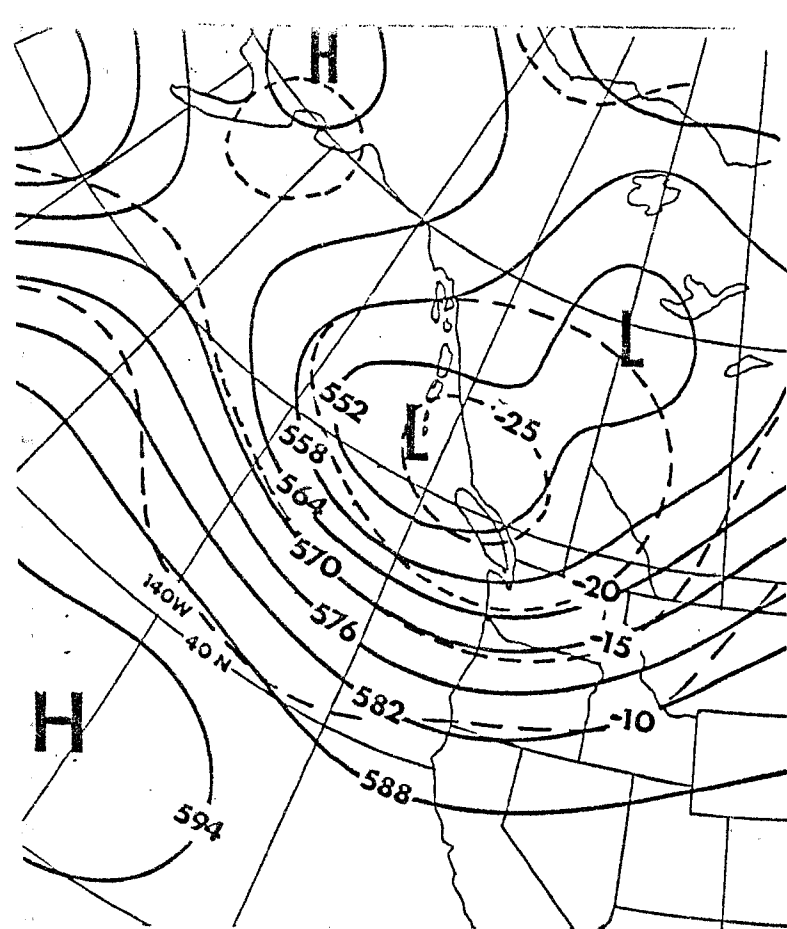


Fig. 2a. 500 mb Analysis, 0500
PDT, 3 July 1986

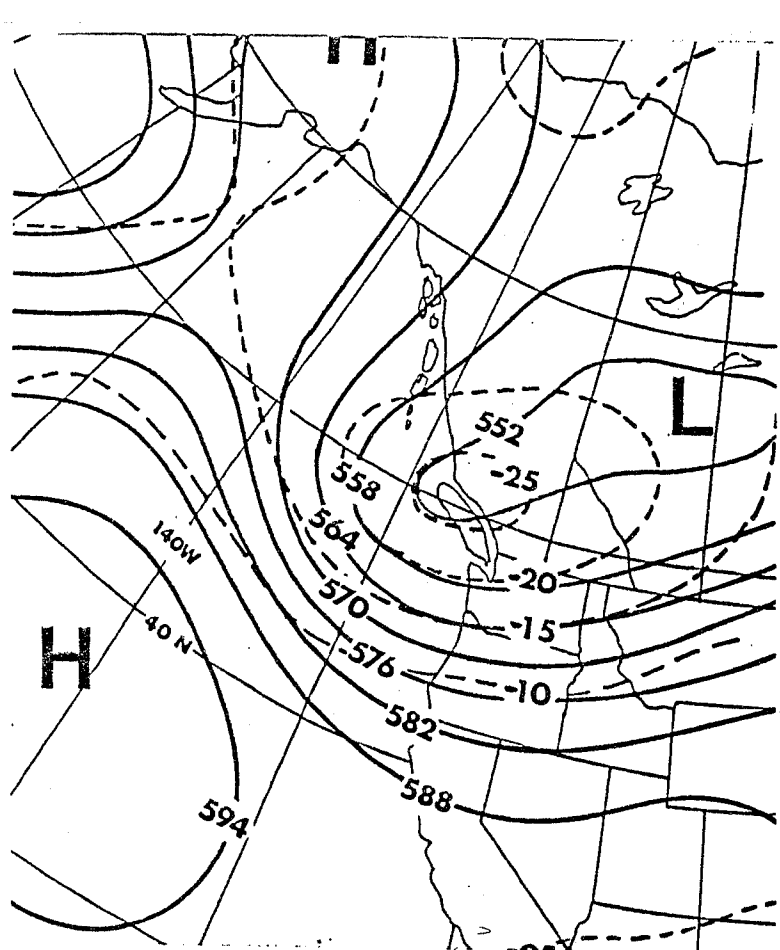


Fig. 2b. 500 mb Analysis, 1700
PDT, 3 July 1986

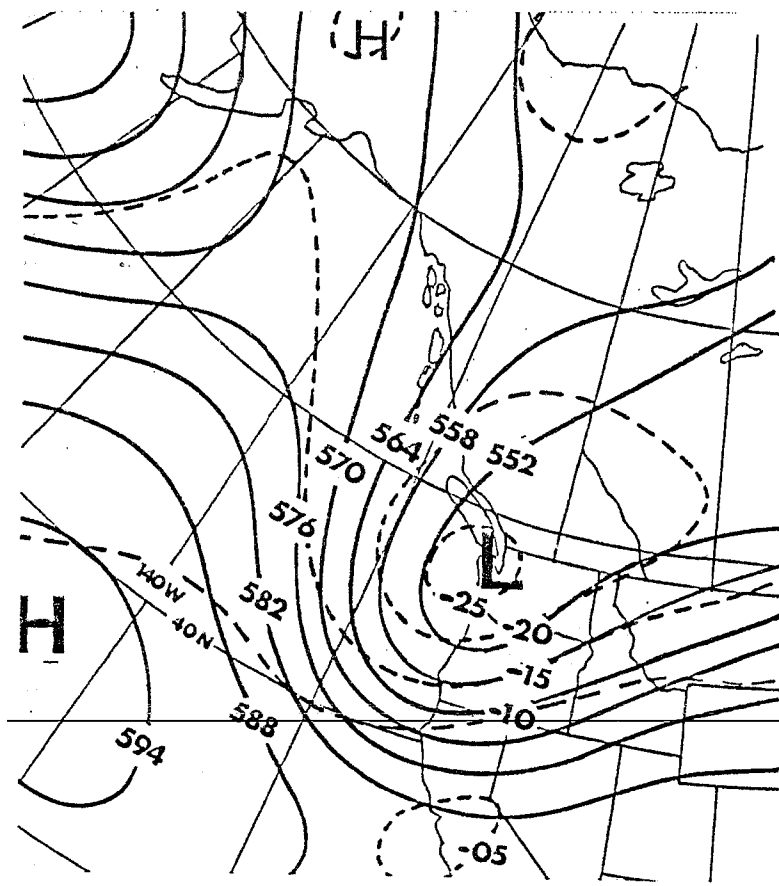


Fig. 2c. 500 mb Analysis, 0500
PDT, 4 July 1986

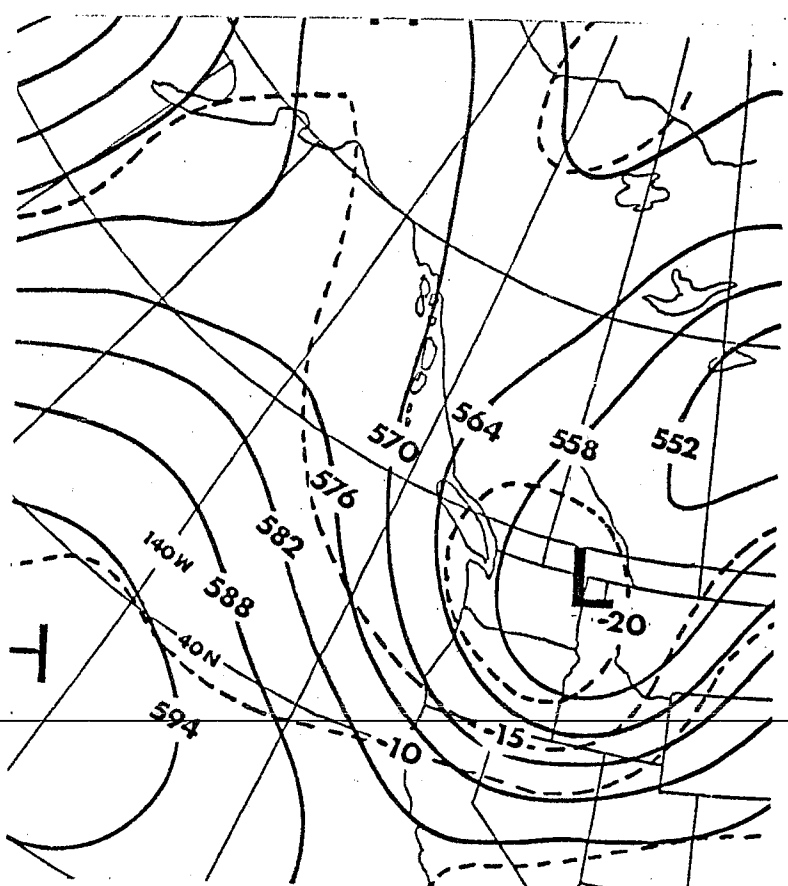


Fig. 2d. 500 mb Analysis, 1700
PDT, 4 July 1986

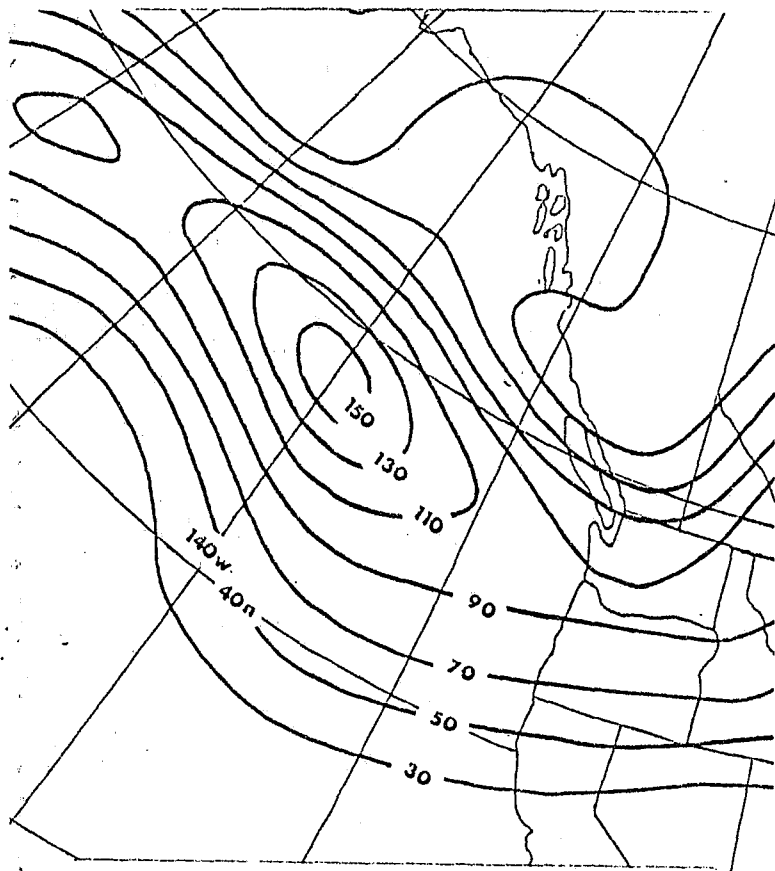


Fig. 3a. 250 mb Jet Stream Analysis, 0500 PDT, 3 July 1986

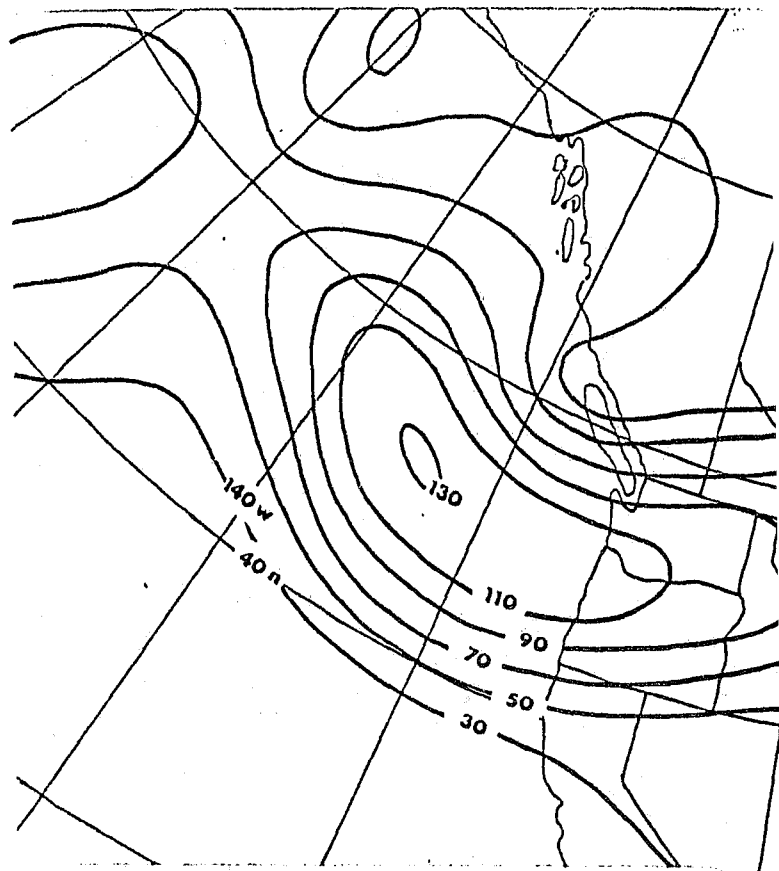


Fig. 3b. 250 mb Jet Stream Analysis, 1700 PDT, 3 July 1986

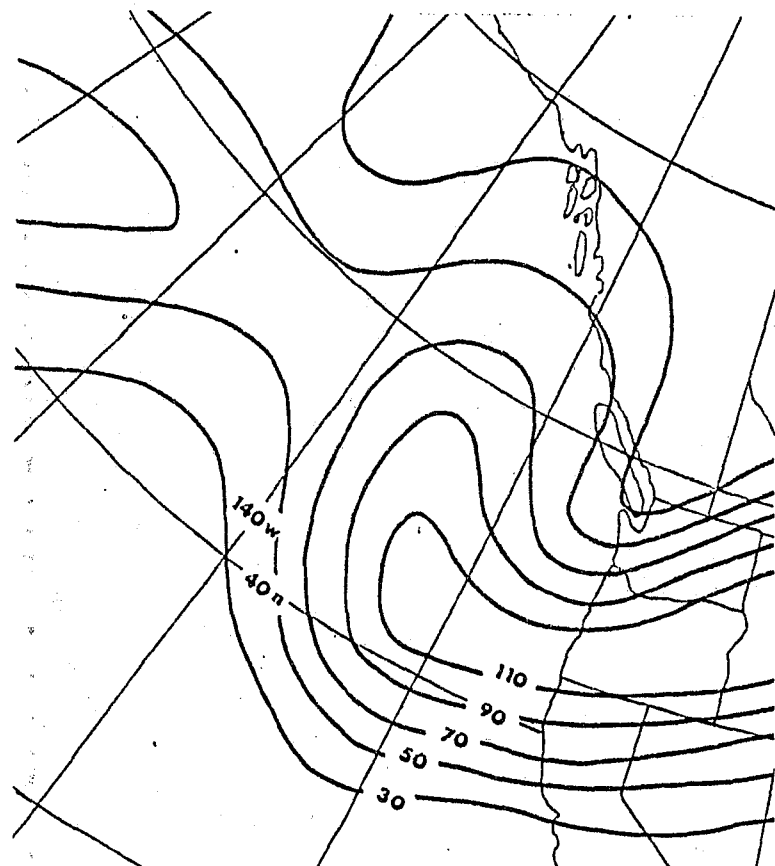


Fig. 3c. 250 mb Jet Stream Analysis, 0500 PDT, 4 July 1986

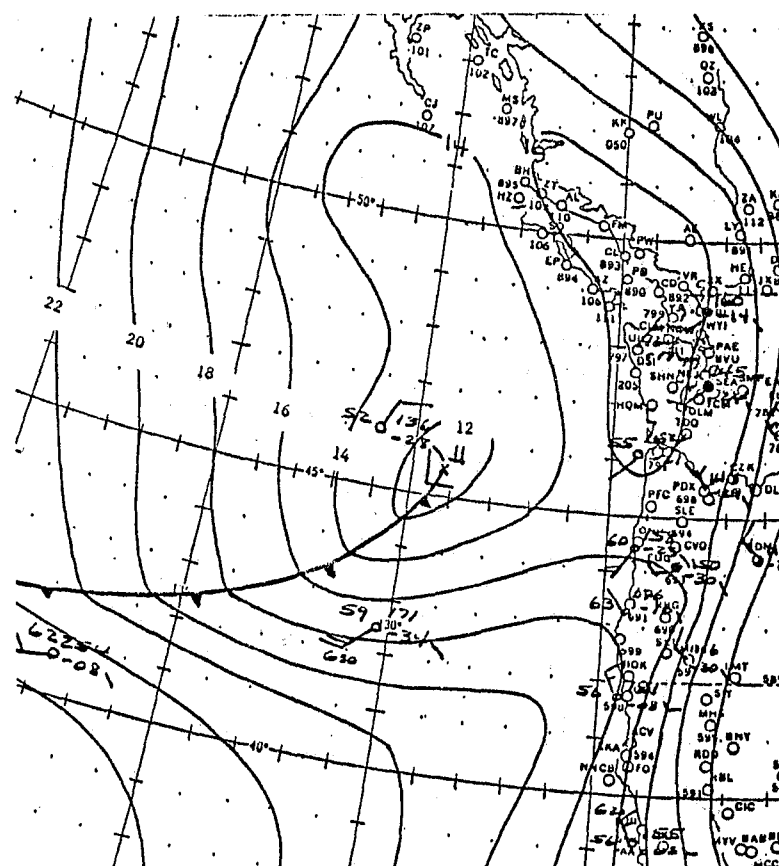


Fig. 4a. Surface Analysis, 1700 PDT, 3 July 1986

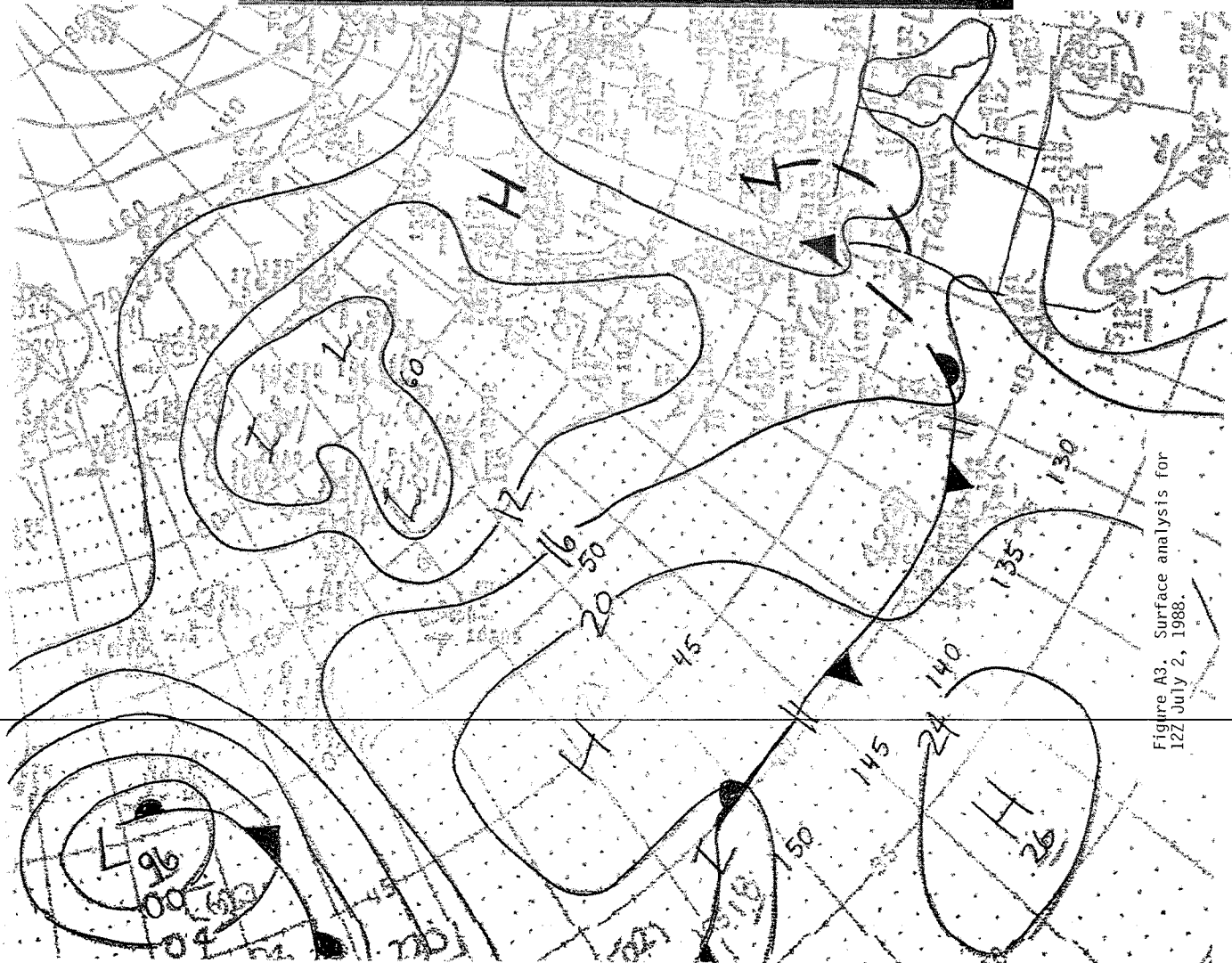


Figure A3. Surface analysis for 12Z July 2, 1988.

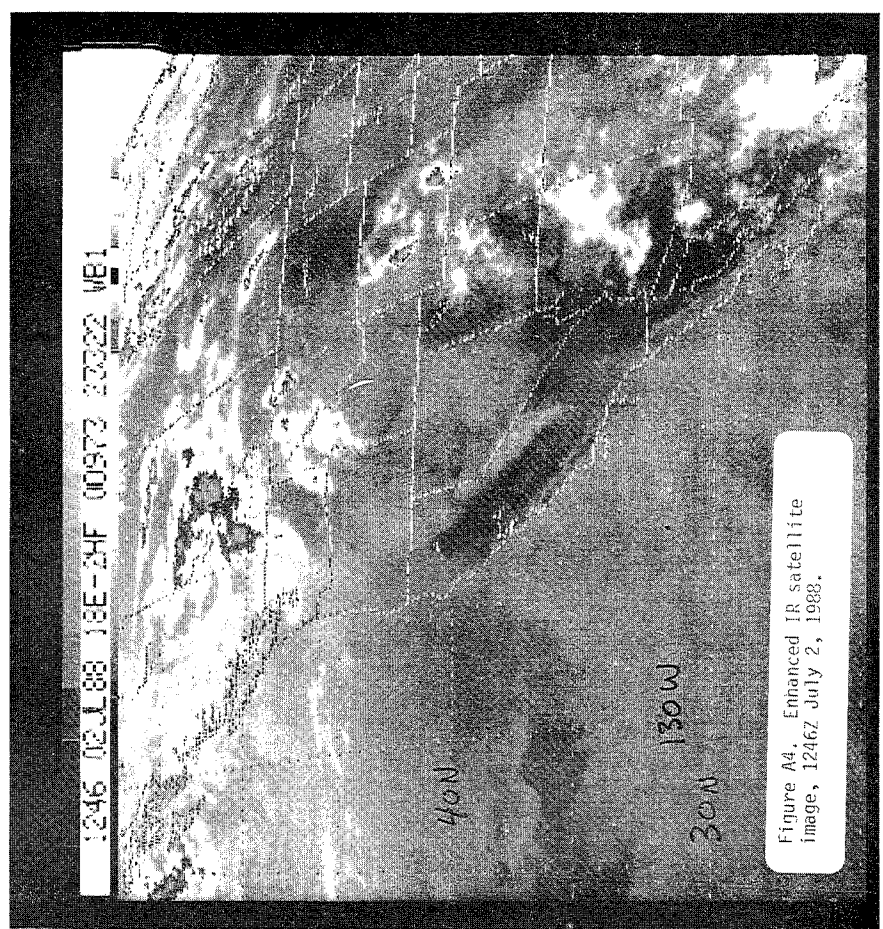


Figure A4. Enhanced IR satellite image, 1246Z July 2, 1988.

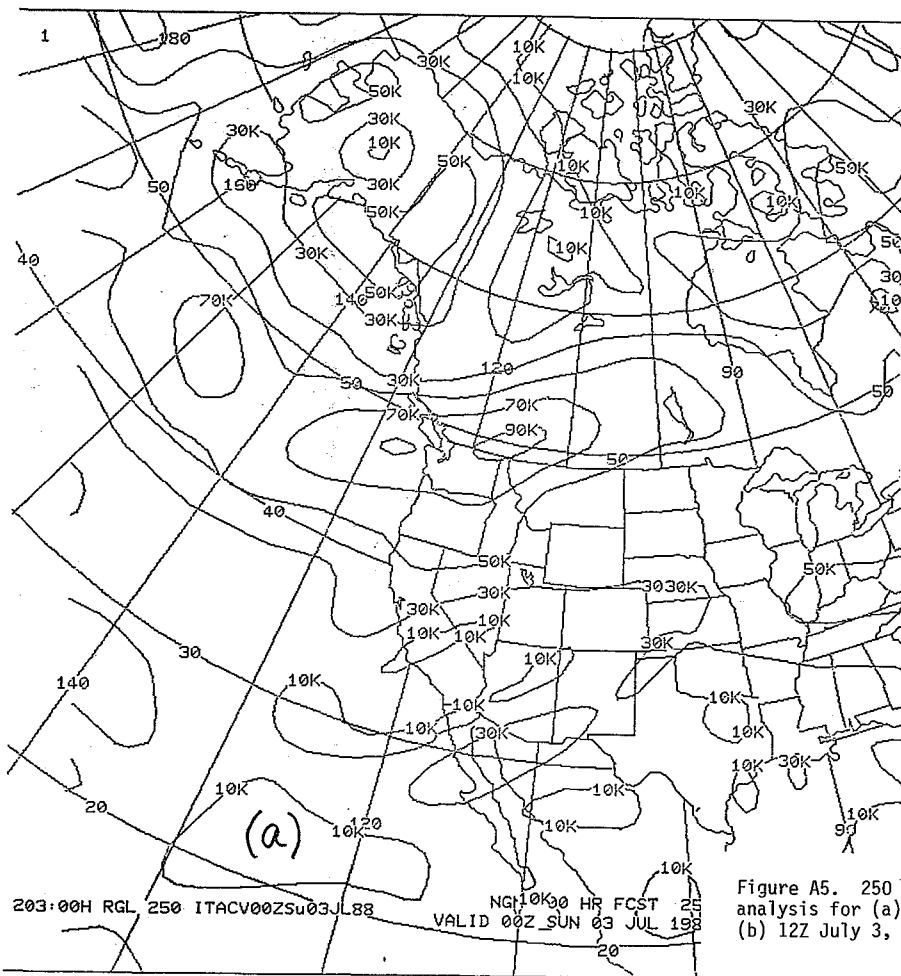
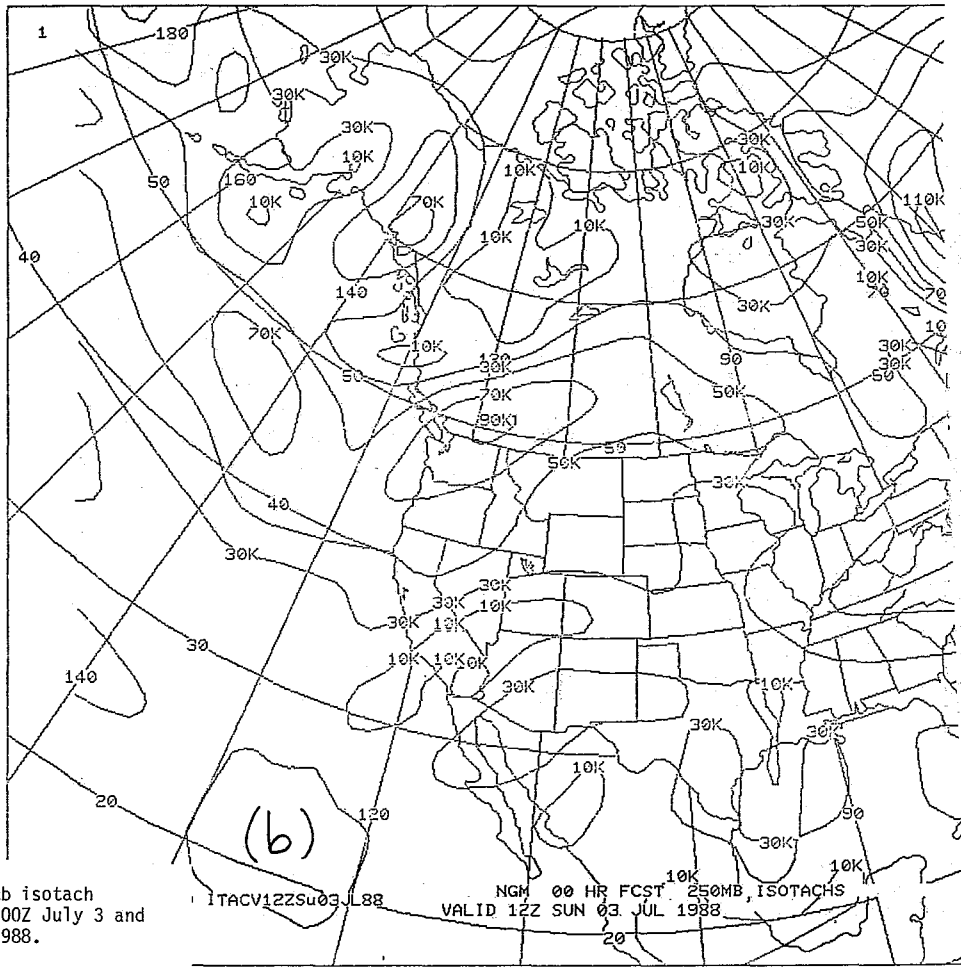


Figure A5. 250 mb isotach analysis for (a) 00Z July 3 and (b) 12Z July 3, 1988.



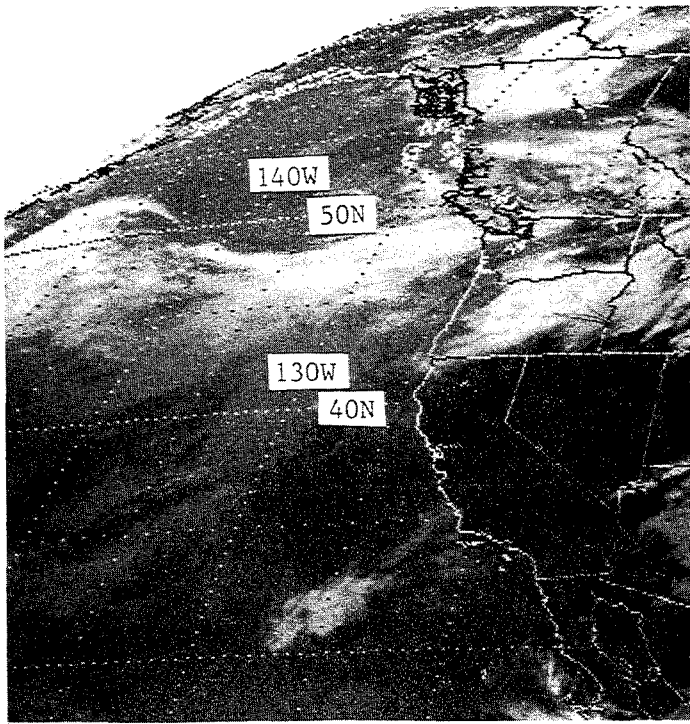


Fig. 5a. IR Satellite Picture
0900 PDT, 3 July 1986

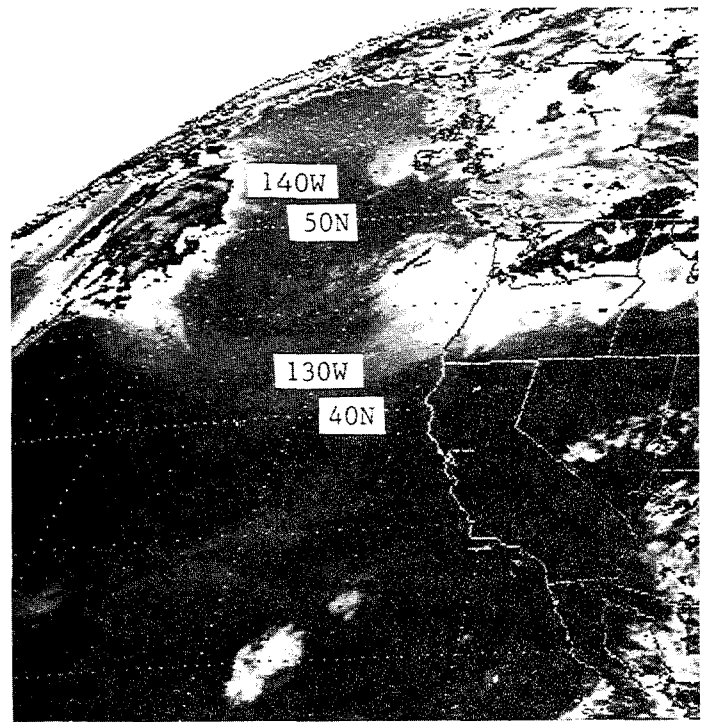


Fig. 5b. IR Satellite Picture
2030 PDT, 3 July 1986

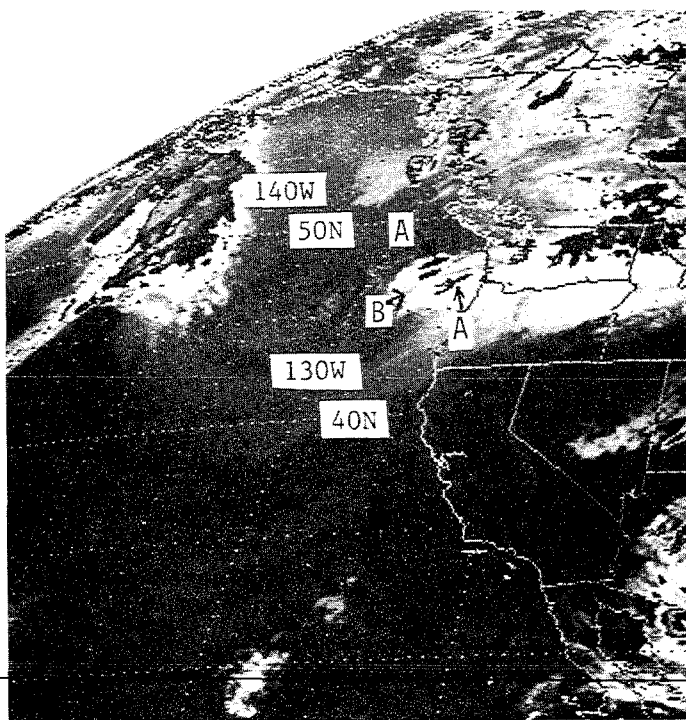


Fig. 5c. IR Satellite Picture
2330 PDT, 3 July 1986

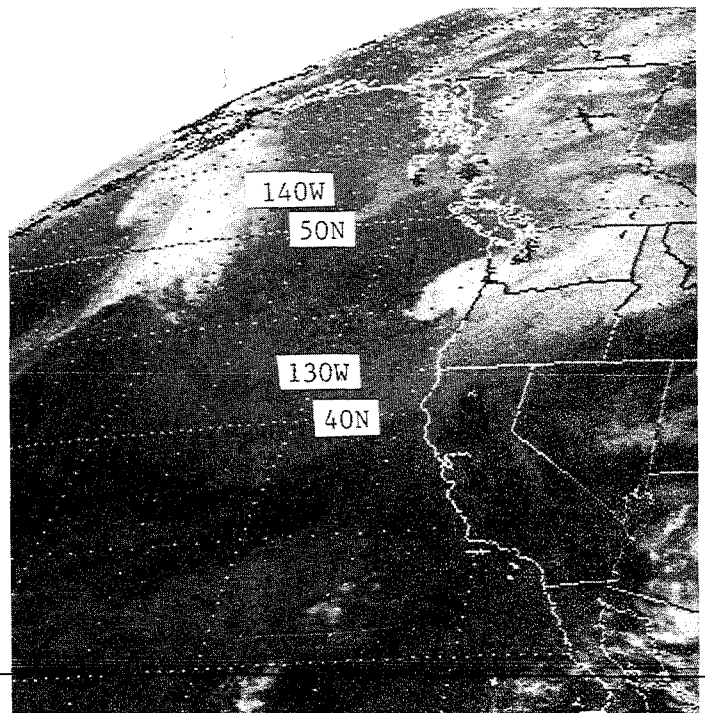


Fig. 5d. IR Satellite Picture
0200 PDT, 4 July 1986