WESTERN REGION TECHNICAL ATTACHMENT
No. 76-7
March 16, 1976

DISSIPATING DEEP LOWS MAY HAVE A SECOND WIND

by
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[Editor's Note: We appreciated receipt of the following report by Bruce Renneke. Although the actual situation discussed occurred several months ago, the type of synoptic regime involved is quite likely during the current spring months. The transmittal memo by MIC Larry Zimmerman stated, "Mr, Renneke was working on the Aviation Desk at that time and used the satellite data successfully to anticipate the weather discussed. We would like to share his observation and this example of use of satellite data with other meteorologists in the Region".]

Quoting from ESSA Technical Report NESC 51, September 1969, p. 3-A-9, "Dissipating low pressure centers produce poorly-organized spiral patterns". However, on October 9 and 10, 1975, an unusual spiral band sheared off, accelerated, and intensified after approximately 24 hours into the dissipation stages of the cyclone.

The following is a short discussion of the synoptic situation and a review of the unusual satellite photographs.

An intense surface low pressure, located in the eastern Pacific, reached its maximum intensity of 978 mb at 060OZ on October 9, 1975 (Figure 1). The 060OZ surface chart shows the occluded front recurving cyclonically in the flow back to the surface center. The 500-mb chart for 120OZ October 9, depicts a cold-core low with closed circulation nearly vertical with the surface low which is what one would expect in a deep surface-low situation (Figure 2).

The stage is now set for the familiar spiral decay process of a dissipating cyclone. The 0545Z IR SMS-2 satellite picture shows the dry air being recurved cyclonically toward its center (Figure 3). The 1015Z picture continues to show the spiral process (Figure 4). By the 1845Z visual picture, the dry air had completed a 360^{o} loop and was starting on its second loop (Figure 5).

The growth and expansion of the spiral band become noticeable when comparing the 1915Z October 9 IR with the 0315Z October 10 IR picture (Figures 6a and 6b). The acceleration becomes apparent in the motion of the leading edge which moved eastward approximately two degrees of latitude. The center of the spiral circulation appeared to be near 44N and 131W. A quick check of the OOOOZ surface chart for October 10 (Figure 7) and the OOOOZ 500-mb analysis (Figure 8) showed the centers to be vertical near 44N and 131W.

The leading edge continued to accelerate as seen in the 0845Z picture (Figure 9) and was shearing off east-northeastward around 35 knots leaving the old circulation center behind. Incidentally, the surface low at 060OZ October 10 was continuing to fill with a central pressure of 992 mb.

The most striking feature between 0315Z (Figure 6b) and 1045Z (Figure 10), besides the shearing off and rapid acceleration, was the enhancement and development of a line of CBs moving toward the Oregon coast. ARTC radar indicated possible TRW based on strong echo return. Amended FTs and route TWEB amendments were issued by Seattle WSFO for the Washington coast and the northwestern coast of Oregon for showers and possible thundershowers. The beautiful sequence of SMS-2 pictures made the above timely accurate amendments possible.

This spiral band which sheared off should not be confused with a comma cloud associated with a significant PVA maximum. This spiral band was, however, probably caused by a minor short-wave trough embedded in the periphery of the upper low which was of too small a magnitude to be shown on the standard charts and progs.

In conclusion, spiral bands from decaying cyclones are usually weak, but a few get a second wind and intensify when they become "whipsawed" away from the dying low.

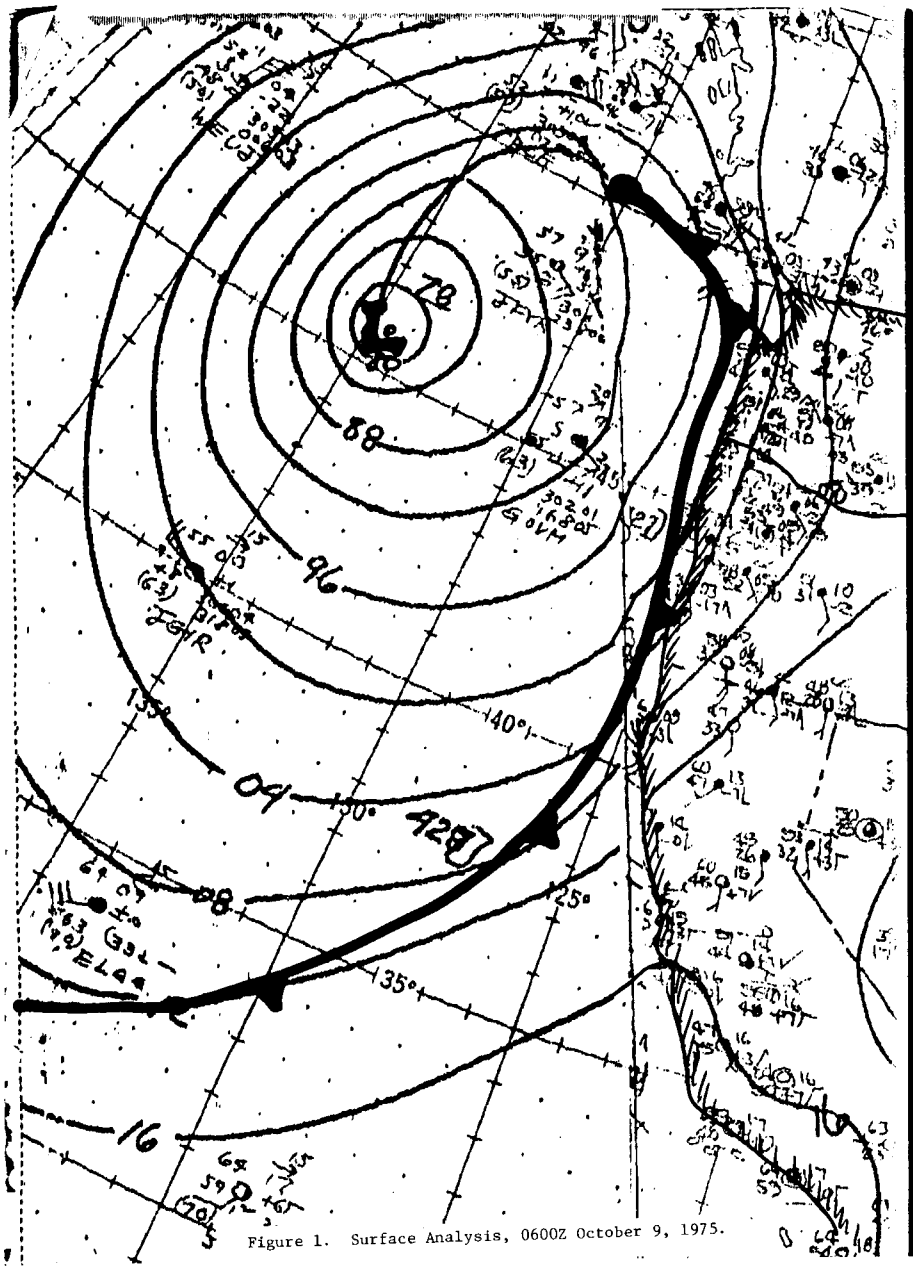

Figure 1. Surface Analysis, 0600Z October 9, 1975.

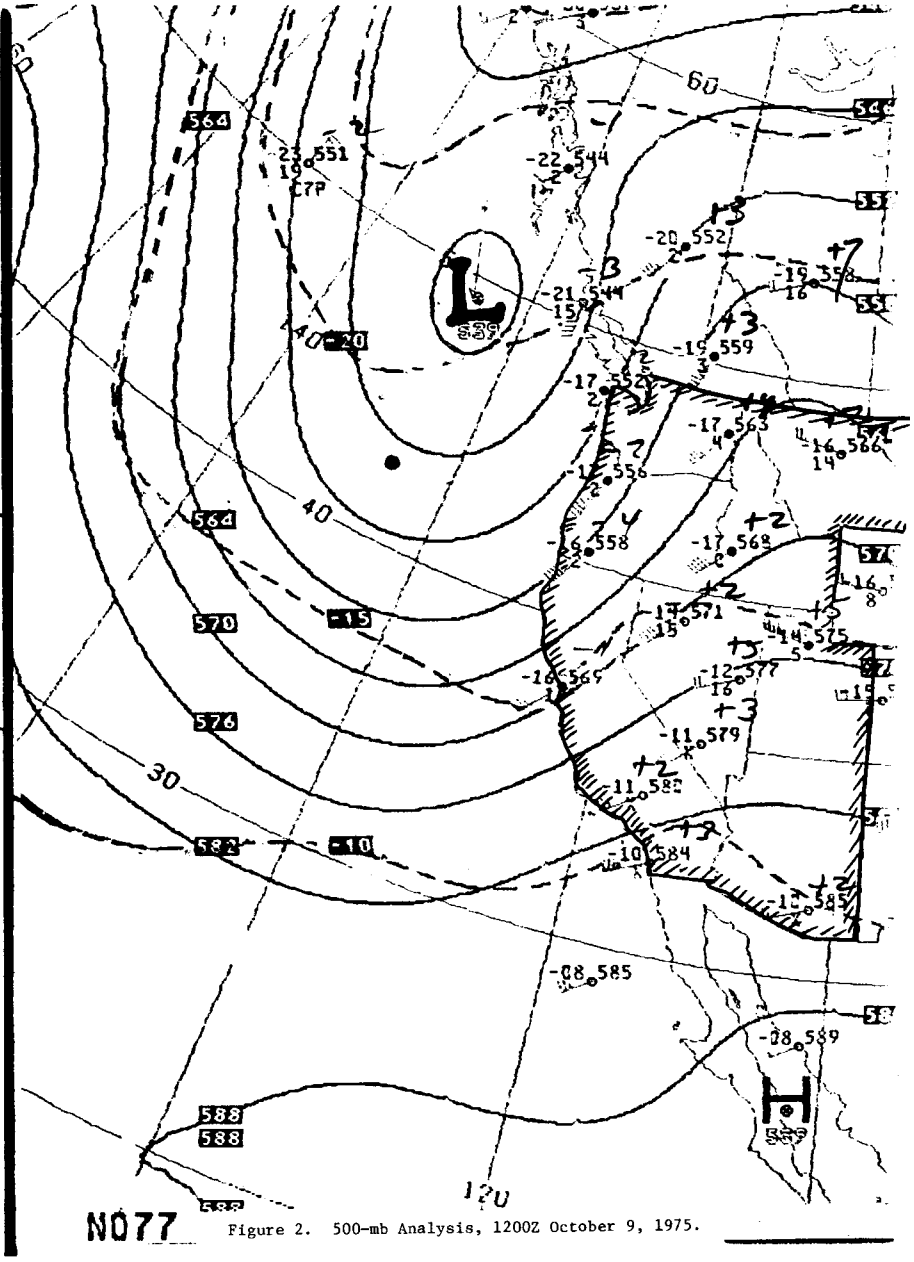

Figure 2. 500-mb Analysis, 1200Z October 9, 1975.

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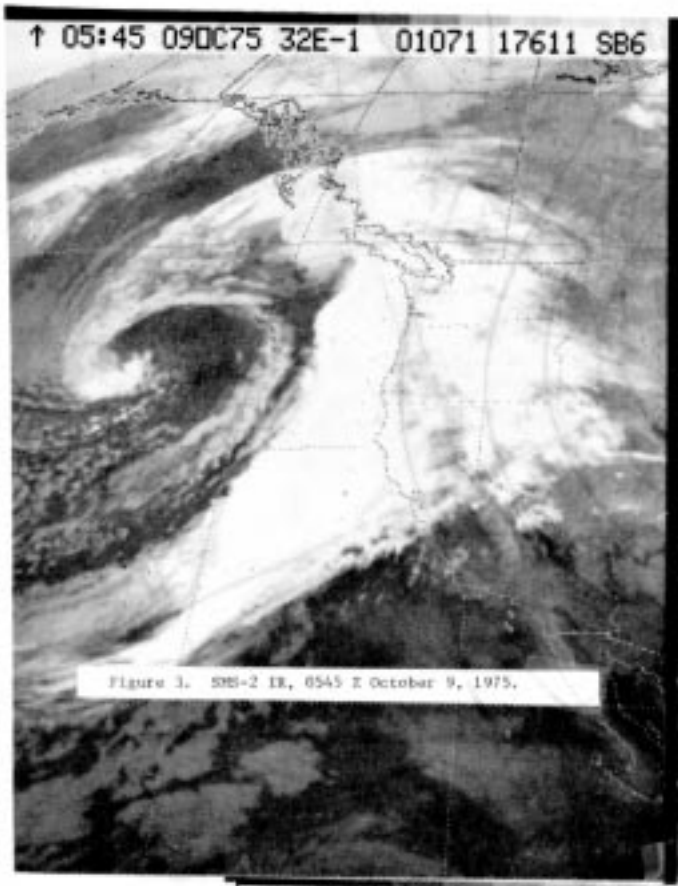

Figure 3. SMS-2 IR, 0545 Z October 9, 1975.

Figure 4. SMS-2 IR, 1015Z October 9, 1975.

Figure 5. SMS-2 Visual, 1845Z October 9, 1975.

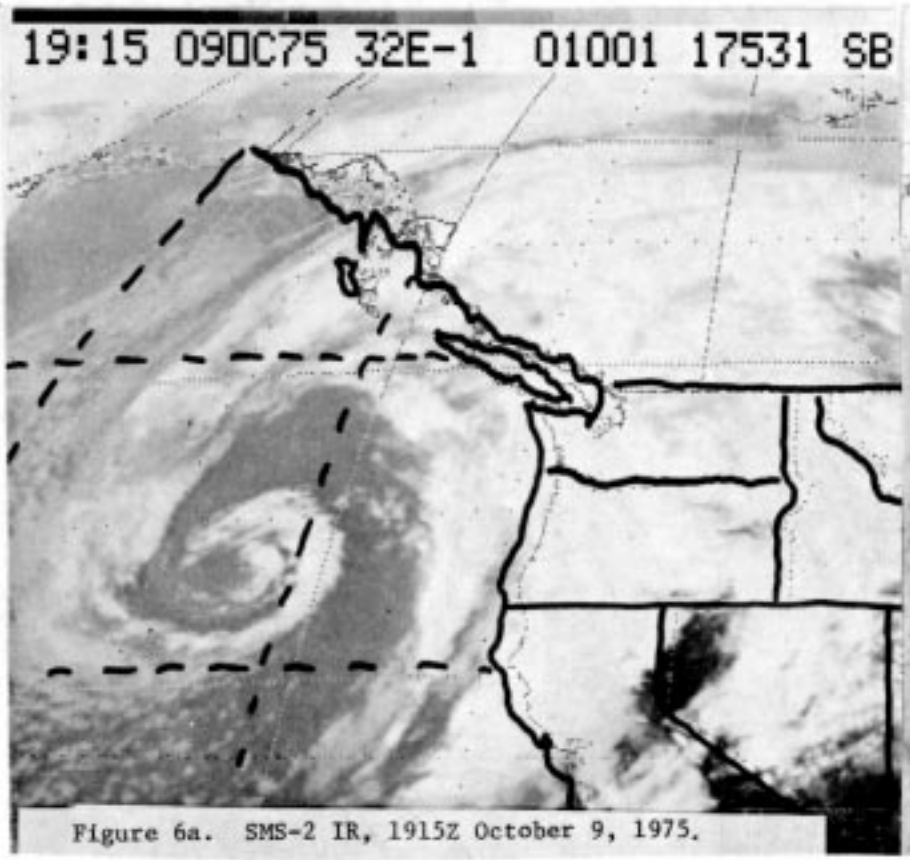

Figure 6a. SMS-2 IR, 1915Z October 9, 1975.

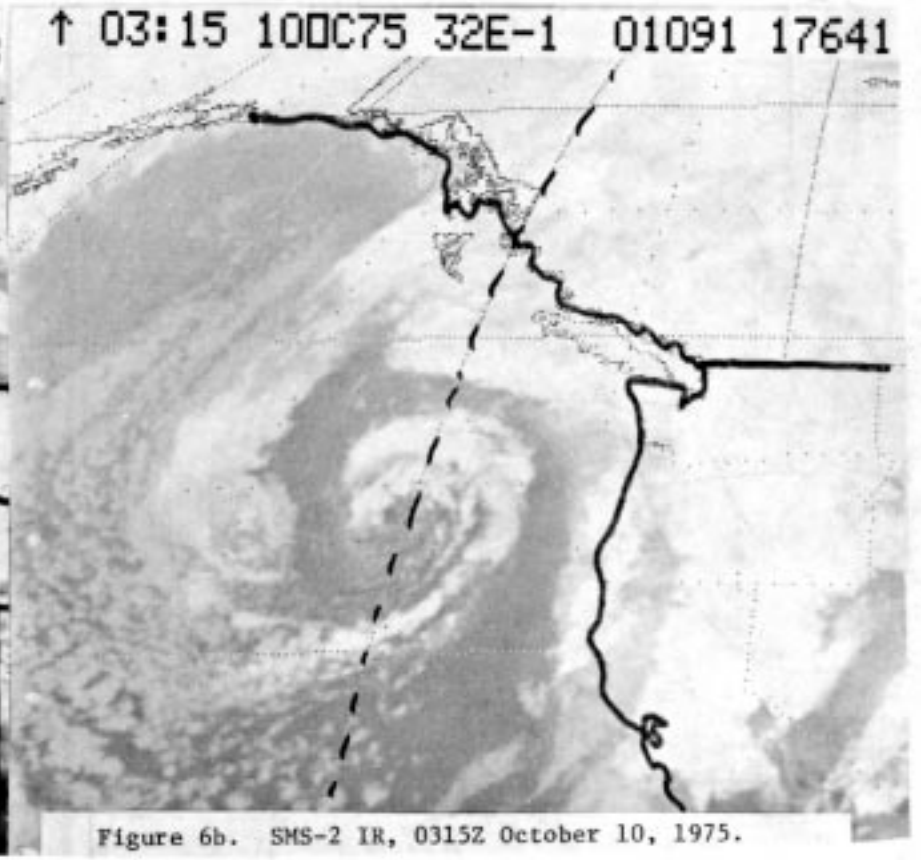

Figure 6b. SMS-2 IR, 0315Z October 10, 1975.

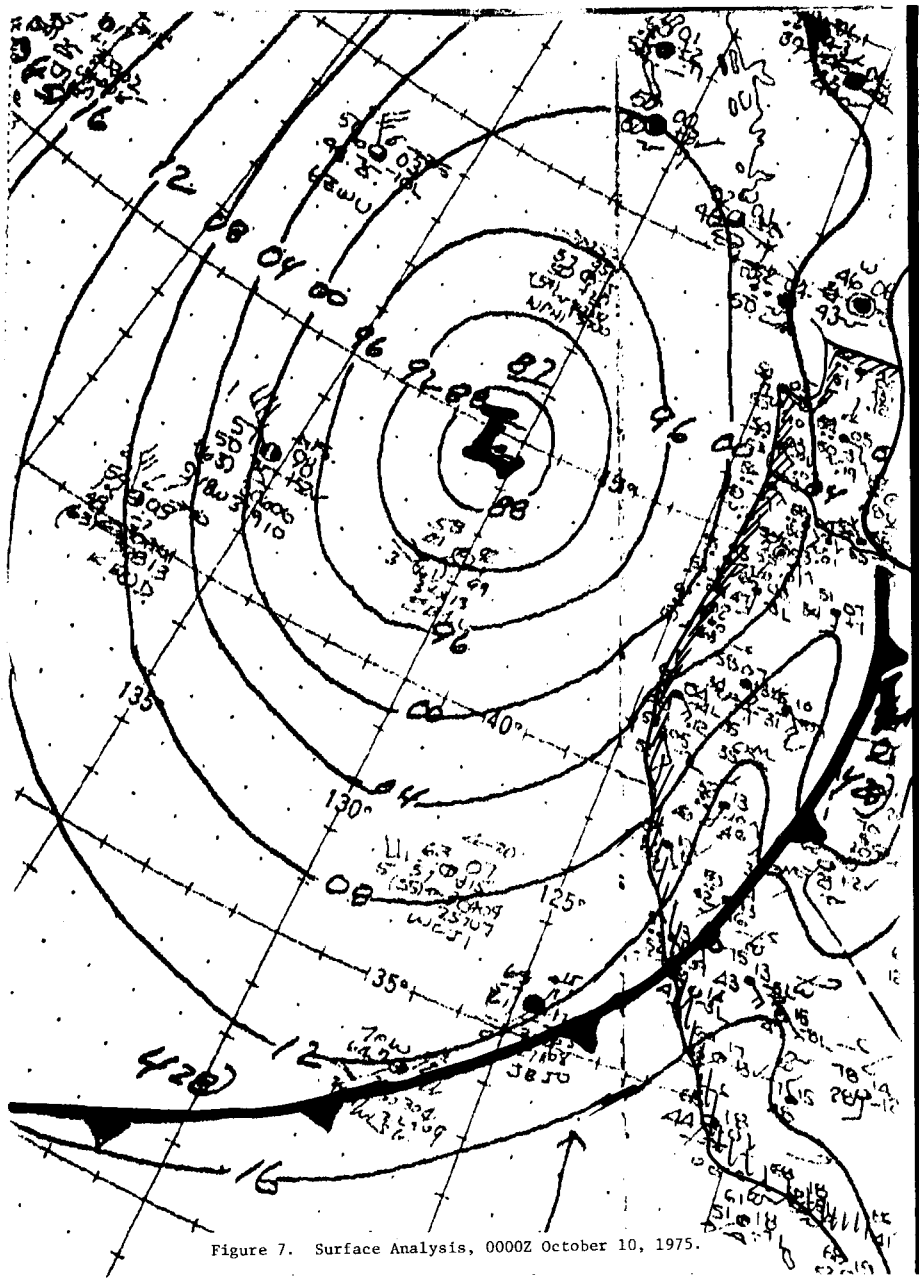

Figure 7. Surface Analysis, 0000Z October 10, 1975.

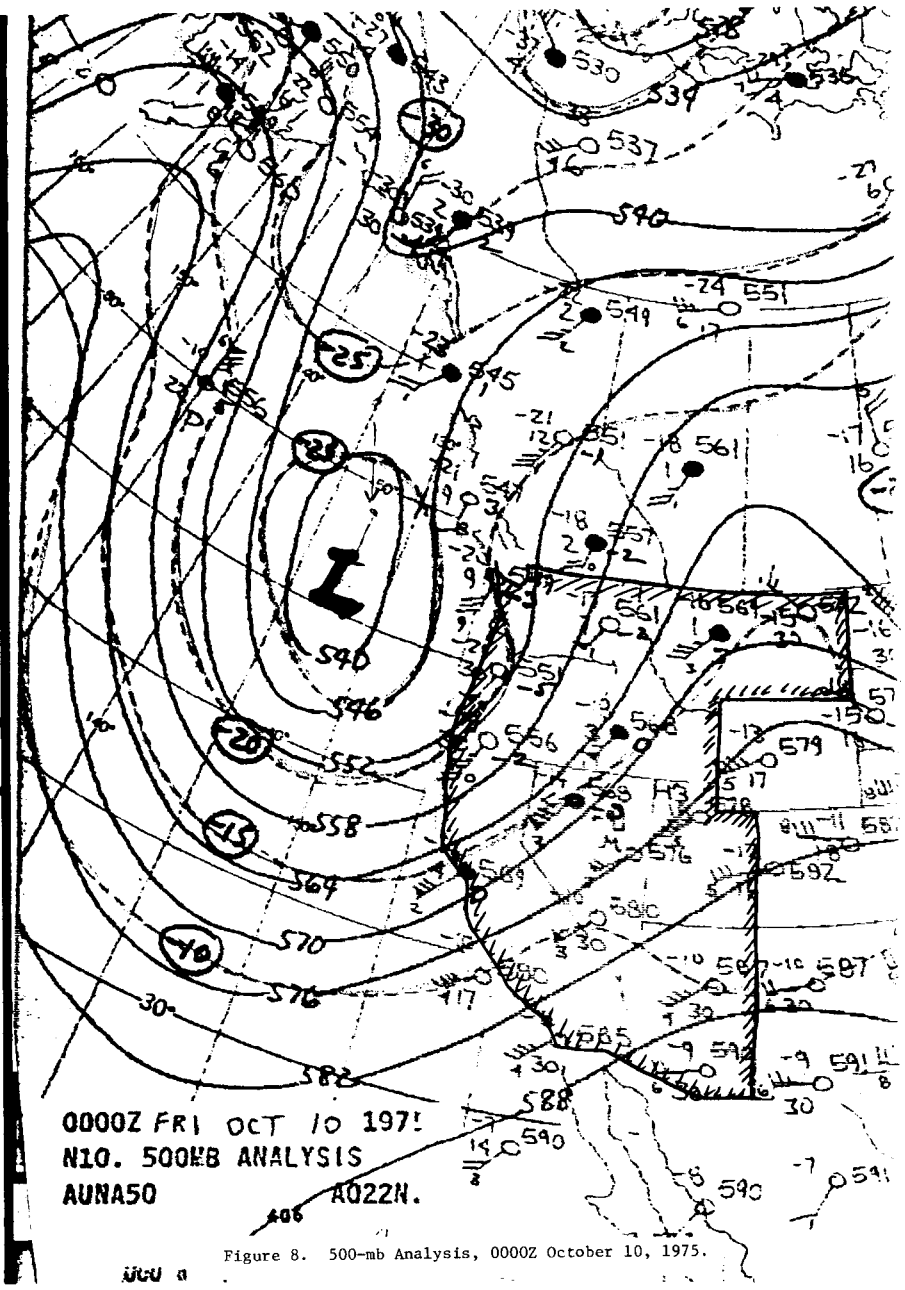

Figure 8. 500-mb Analysis, 0000Z October 10, 1975.

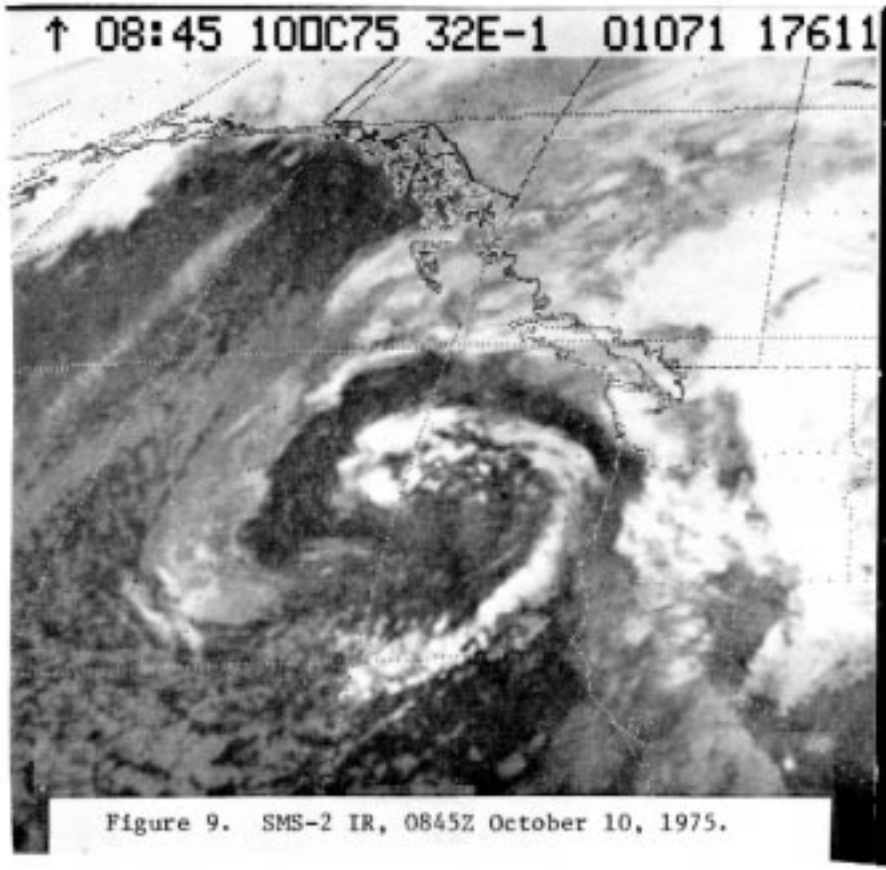

Figure 9. SMS-2 IR, 0845Z October 10, 1975.

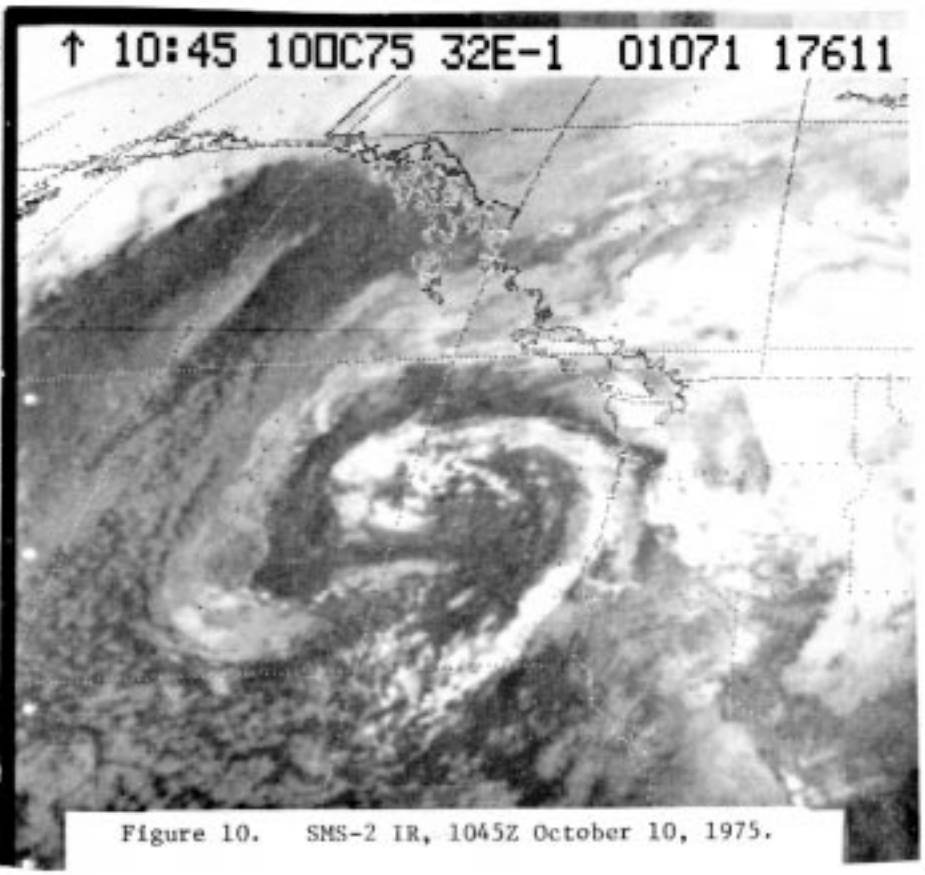

Figure 10. SMS-2 IR, 1045Z October 10, 1975.