

WESTERN REGION TECHNICAL ATTACHMENT
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QUICKER THAN YOU THINK!

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Except for some fog and stratus near the central and southern Oregon coasts, the morning of 30 July 1983 was clear and bright across all of Oregon and, in fact, over much of the West (see Figure 1). Some convective debris had drifted northwestward into southern Nevada from the previous evening's thunderstorms in the desert southwest (Figure 2).

The big meteorological question was if possible afternoon thunderstorms could advect into southeast Oregon, and if so, on what day?

By 1915Z, skies were still clear statewide (Figure 3). However, by 0015Z (Figure 4), thunderstorms had erupted over much of central Oregon. Later that evening (Figure 5), a larger cluster of thunderstorms had spread into Washington State, and even Portland had witnessed some late fireworks. Some heavy thunderstorms (VIP level 6s) were detected by radar near Lakeview during the evening (Figure 6).

Mid-troposphere winds aloft (Figure 7) were generally out of the Southeast

Speeds were quite light, i.e., 10 knots or less across Nevada which was the alleged "source" region for the moisture.

How could that moisture possibly advect northward so fast? It couldn't! The leading edge of the moisture apparent from the satellite imagery translated over 600 nautical miles in 17 hours (that's over 35 knots). The moisture for our thunderstorms condensed from local low level water vapor being lifted in the general upward vertical motion field over the area.

Only weak PVA was noted in the light southerly flow over northern Oregon, with NVA to the south (Figure 8). Thus, skies remained clear. However, note the strongly diverging wind field over central Oregon at the 250 mb level (Figure 9). The divergence at 250 mb (Figure 10) calculated by the mesoanalysis program showed an elongated area of strong mass divergence aloft running north-south through central Oregon.

Also at 12Z, the 700 mb divergence field (Figure 11) showed convergence in the lower troposphere. At 20Z on the 30th, surface mesoanalysis convergence revealed strong mass convergence again through (you guessed it) central Oregon (Figure 12).

Surface pressure analyses showed that a north-south thermal trough which had taried in the Willamette Valley in the morning's wee hours was shifting eastward into the Cascades (Figures 13, 14, and 15). This would lend further credence to low level convergence developing in central Oregon.

At 20Z, all of Oregon still basked unaware in full summer sunshine. Strong solar surface heating was the final trigger for the dramatic (for Oregon, at least) convection that ensued.

4 00502 19221 UC2



Figure 1. Visible satellite picture, 1315Z, July 30, 1983.

0015 31JL83 38A-2 00872 22642 S86



Figure 4. Visible satellite picture, 0015Z, July 31, 1983.

4HF 00512 19221 UC2



Figure 2. Enhanced IR satellite picture, 1315Z, July 30, 1983.

0615 31JL83 38E-2HF 00903 22672 S86

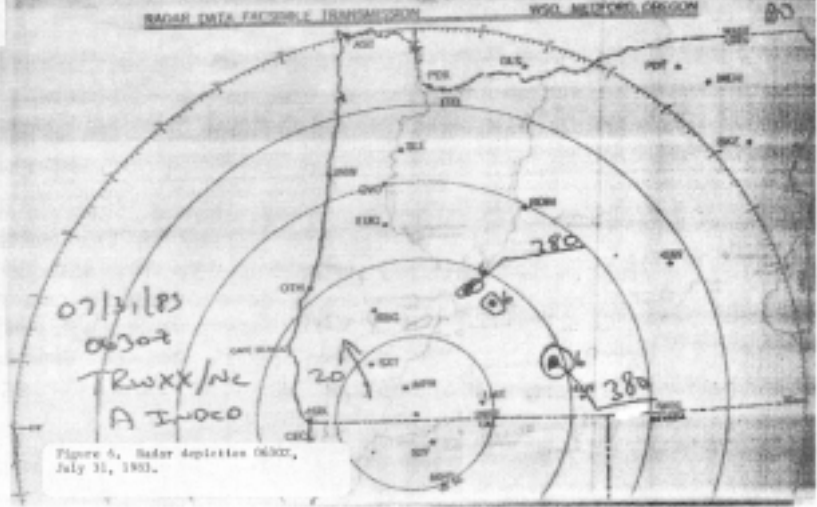


Figure 5. Enhanced IR satellite picture, 0615Z, July 31, 1983.

4 00481 19191 UC2



Figure 3. Visible satellite picture, 1915Z, July 30, 1983.



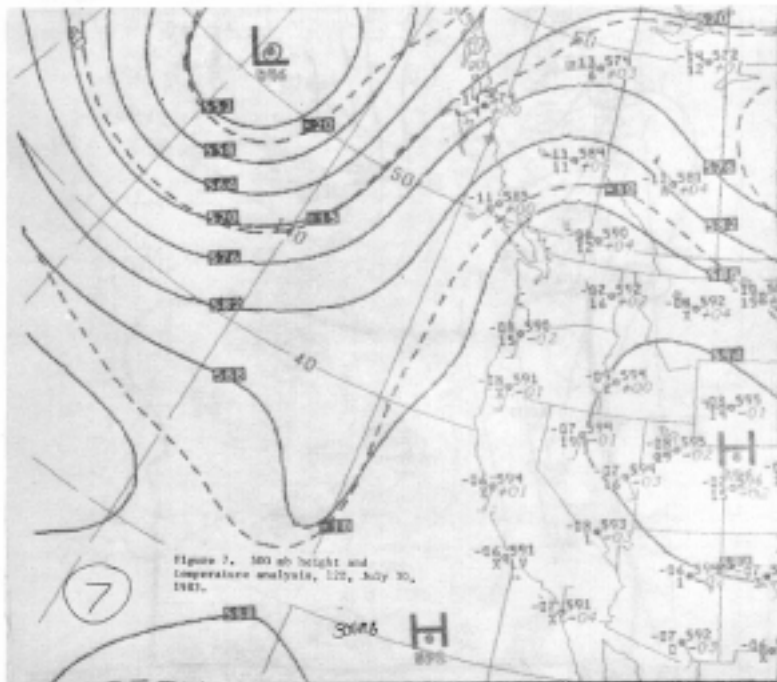


Figure 7. 500 mb height and temperature analysis, 12Z, July 30, 1981.

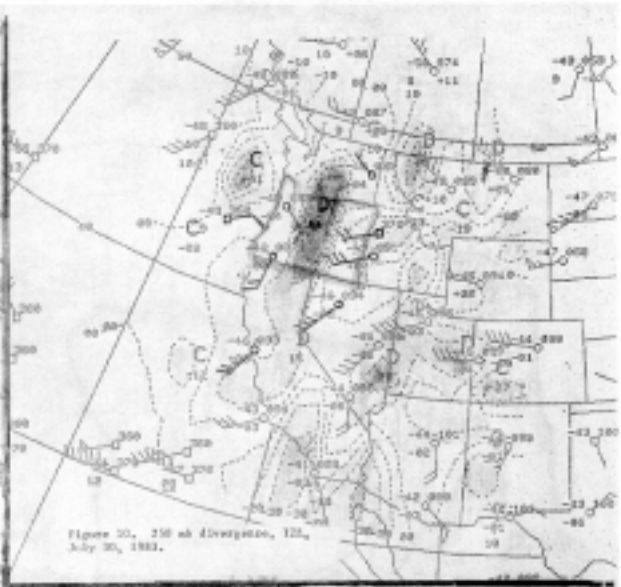


Figure 10. 250 mb divergence, 12Z, July 30, 1981.

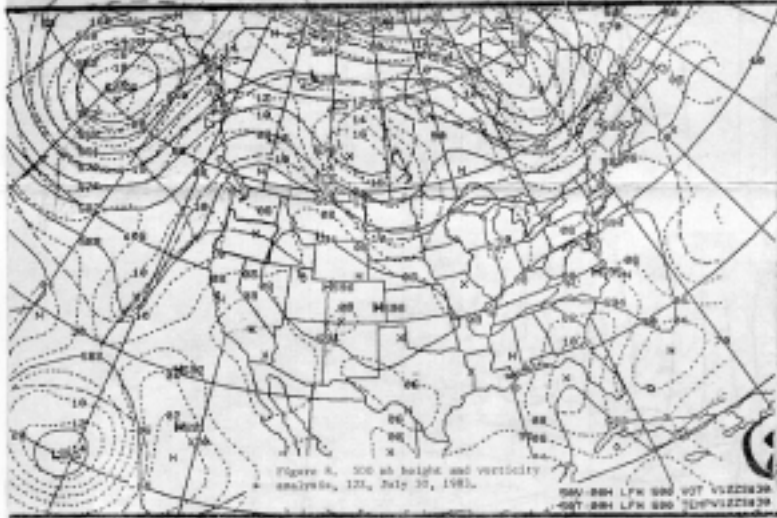


Figure 8. 500 mb height and velocity analysis, 12Z, July 30, 1981.

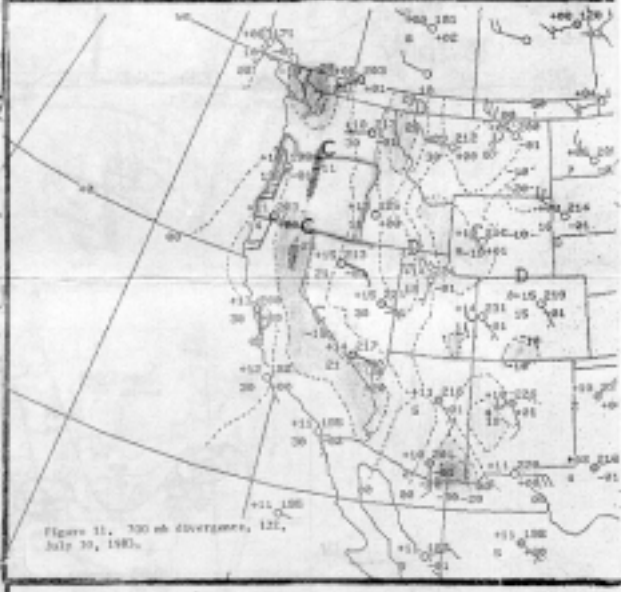


Figure 11. 300 mb divergence, 12Z, July 30, 1981.

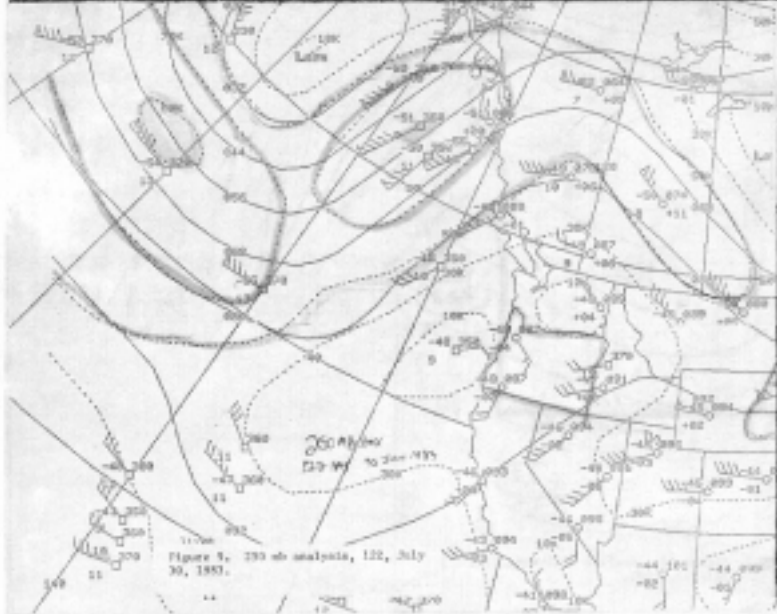
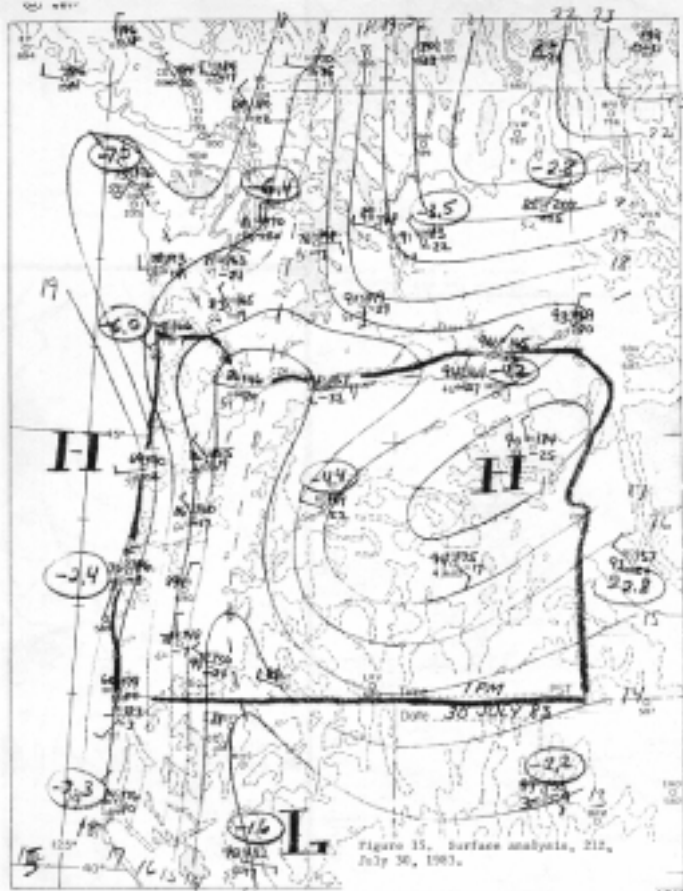
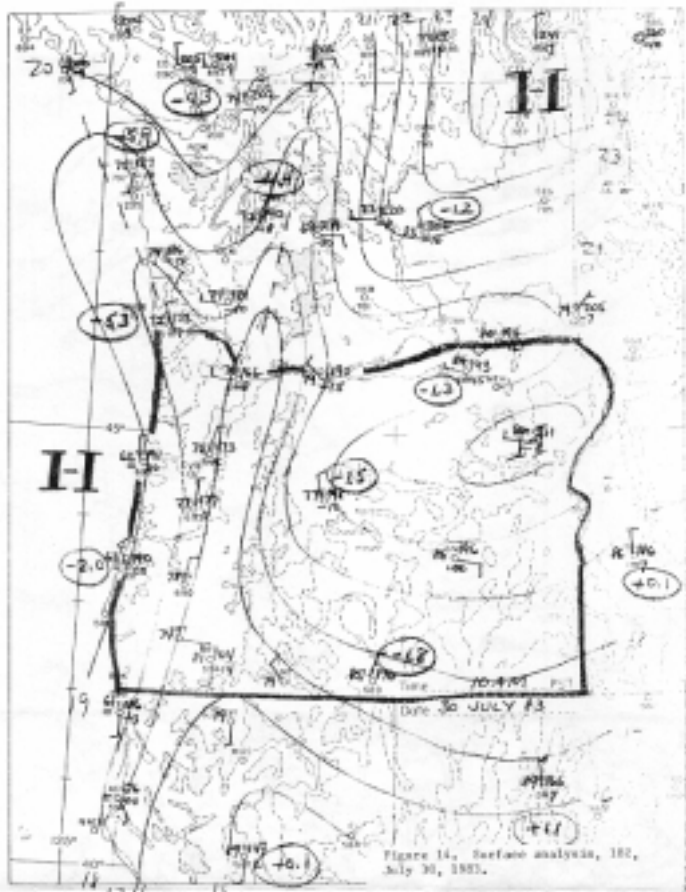
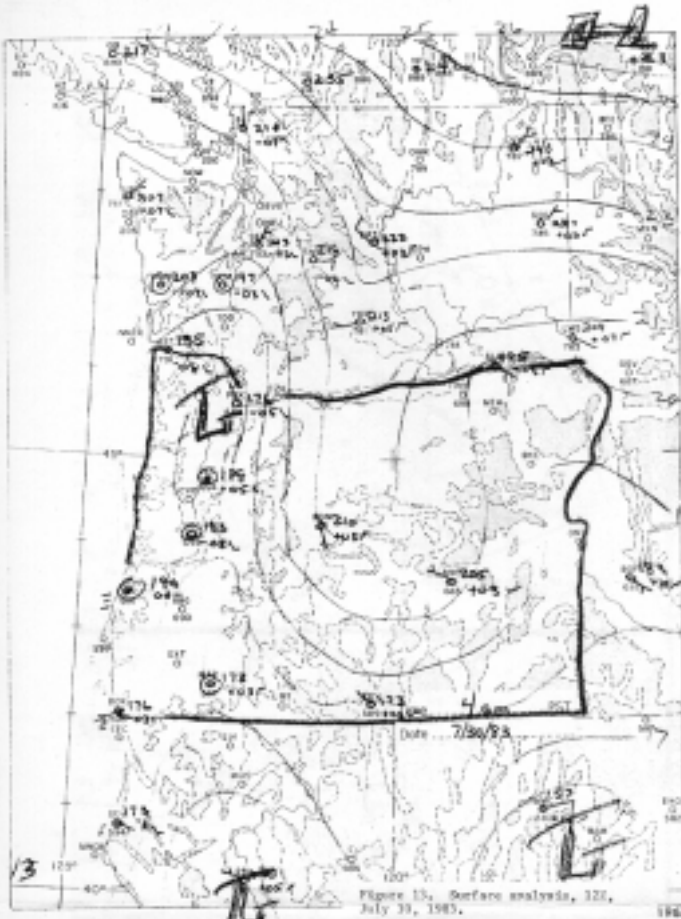


Figure 9. 250 mb analysis, 12Z, July 30, 1981.



Figure 12. Surface convergence, 20Z, July 30, 1981.

20Z 7/30/81



+202 dec 1965.