EASTERN REGION TECHNICAL ATTACHMENT
No. 86-4(C)
March 17, 1986

SEVERE WEATHER OUTBREAK - MARCH 10, 1986

On March 10th, the Ohio Valley experienced an outbreak of severe weather --- most of the events taking place between 1900 and 2200Z. Preliminary reports indicated about 70 events, 27 tornadoes and, fortunately, only two deaths (Figure 1). This was a somewhat unusual outbreak in that the dewpoints were only in the mid to upper 50s, the atmosphere was initially stable (Figure 2) although forecast to become unstable (Figure 3) and there were no signs of low level warm air advection (Figure 4). Objective and subjective guidance performed well (Figures 5 and 6). The key to this event may have been the dynamics rather than the thermodynamics. There was a strong low level jet at 850mb. (Figure 4) and strong geostrophic flow at the surface (Figure 7) --- both implying low level convergence and upward vertical motion. Low level upward motion tends to destabilize the atmosphere and may explain the NGM forecast of decreasing lifted index values (Figure 3).

This severe weather episode gave us our first opportunity to look at the output of the Southern Region mesoscale programs (TM SR-114). Figure 8 (courtesy of WSFO CLE) shows the two hour change in surface moisture convergence and the maximum change is well-correlated with the area experiencing severe weather at the time. This demonstrates something that we've preached in the past --- in evaluating derived mesoscale fields, the change is more important than the absolute value.

SCIENTIFIC SERVICES DIVISION
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Attachments (Figures 1-8)

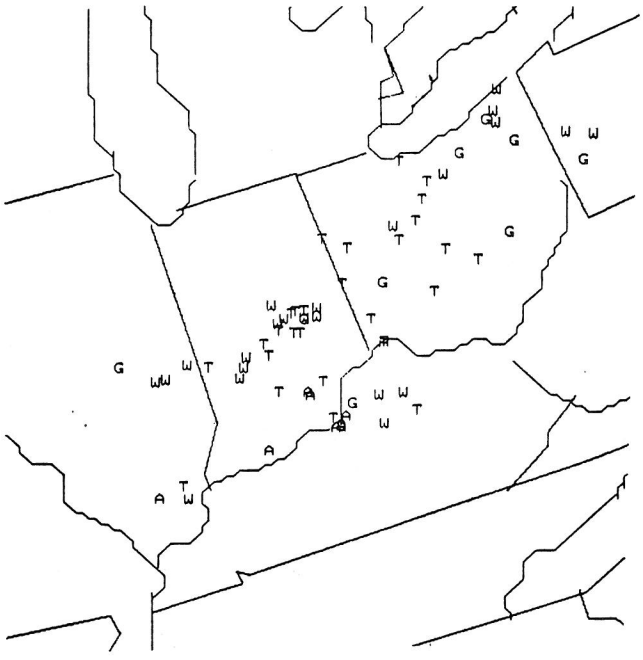

Figure 1. Preliminary severe weather reports, 3/10/86, 1200Z - 3/11/86, 1200Z.

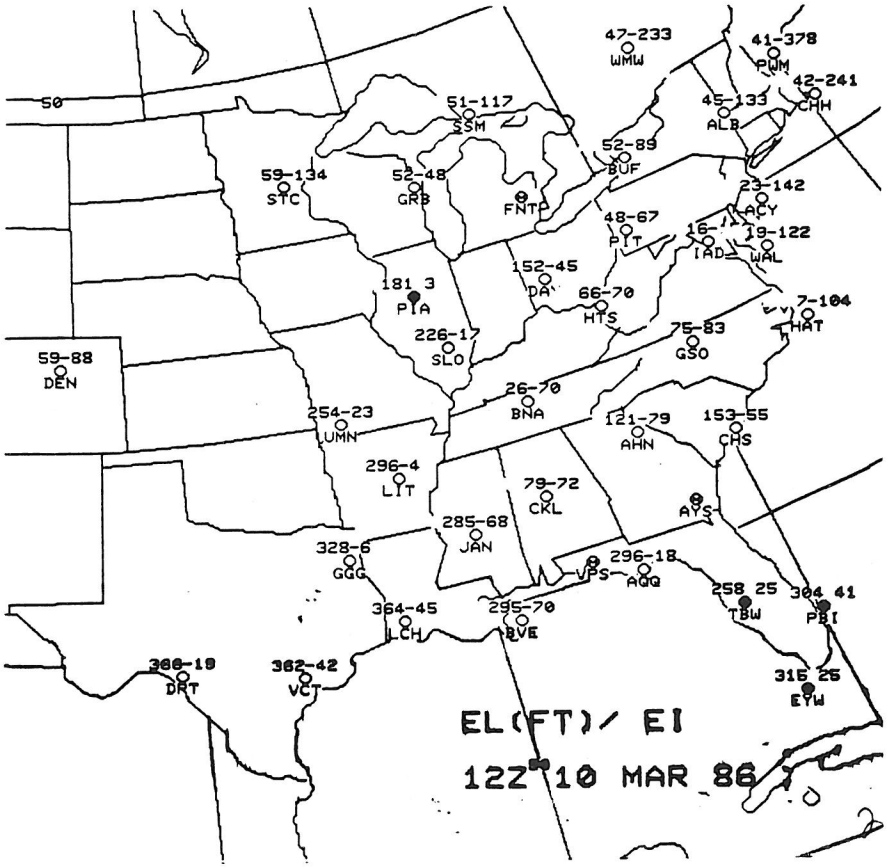

Figure 2. Observed equilibrium level and energy index, 3/10/86, 1200Z.

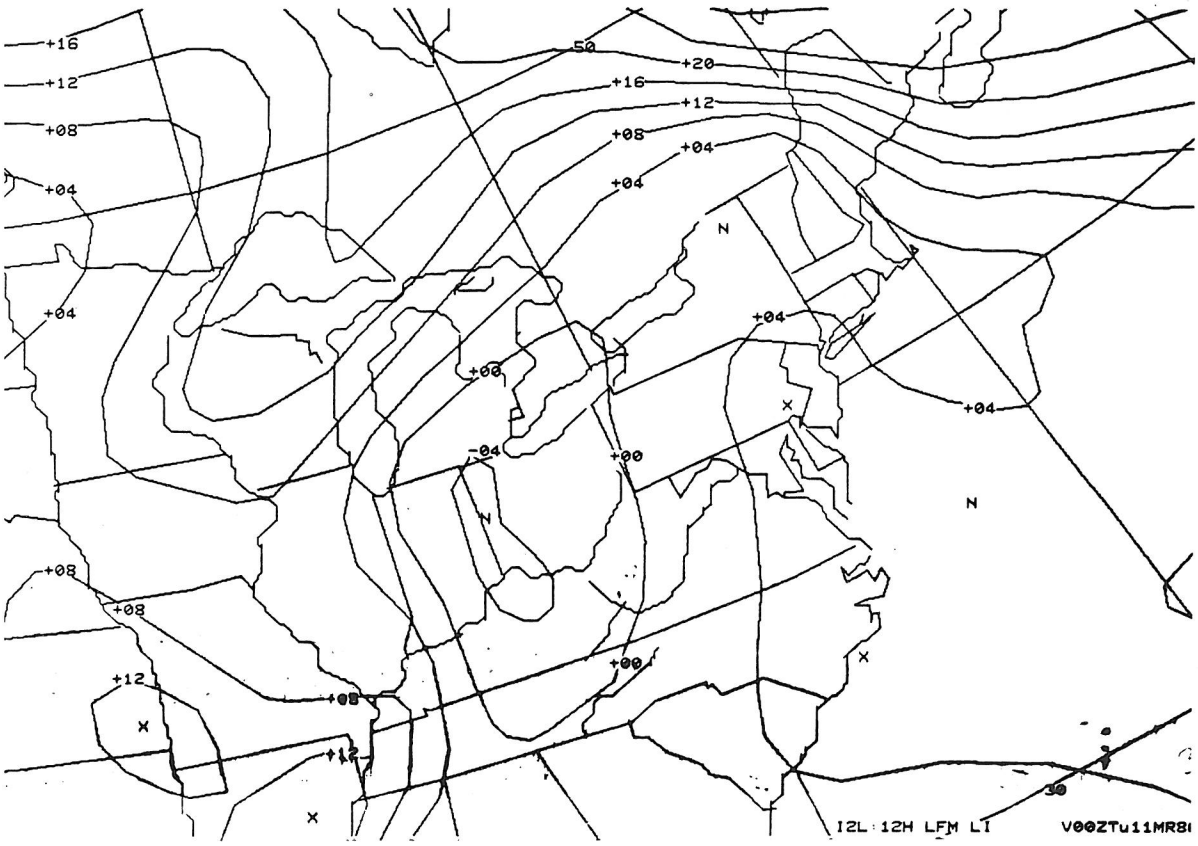

Figure 3. 12 hour NGM forecast of lifted index, valid 3/11/86, 0000Z.

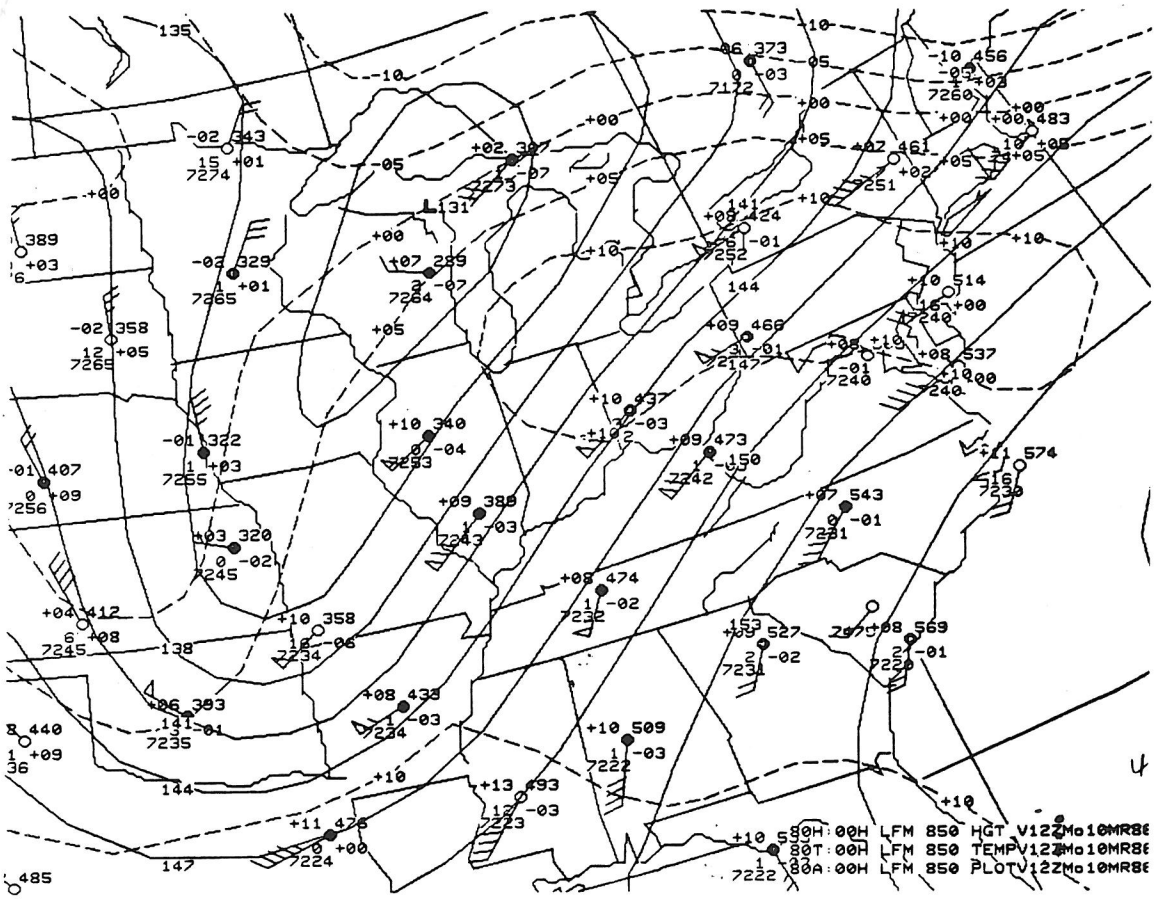

Figure 4. 850 mb plot and analysis, 3/10/86, 1200Z.

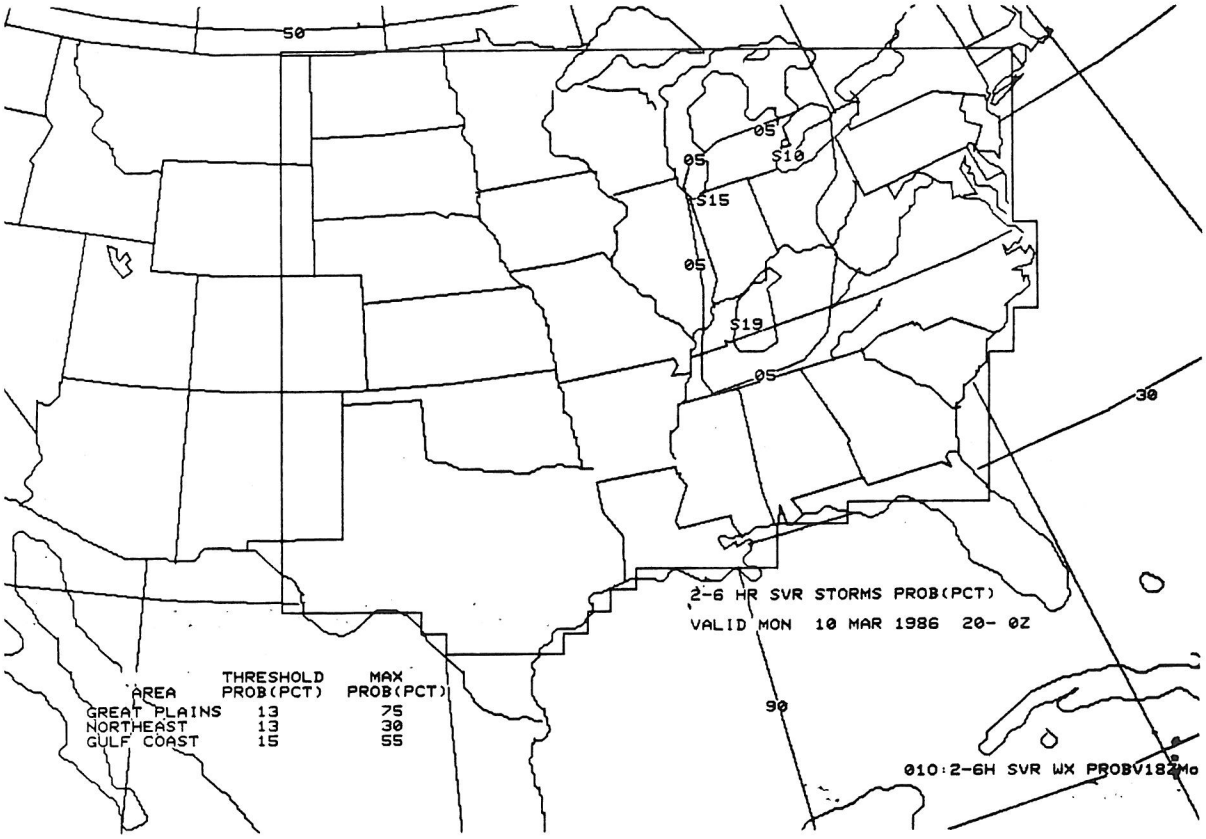

Figure 5. 2-6 hour severe weather probabilities, valid 3/10/86, 2000-0000Z.

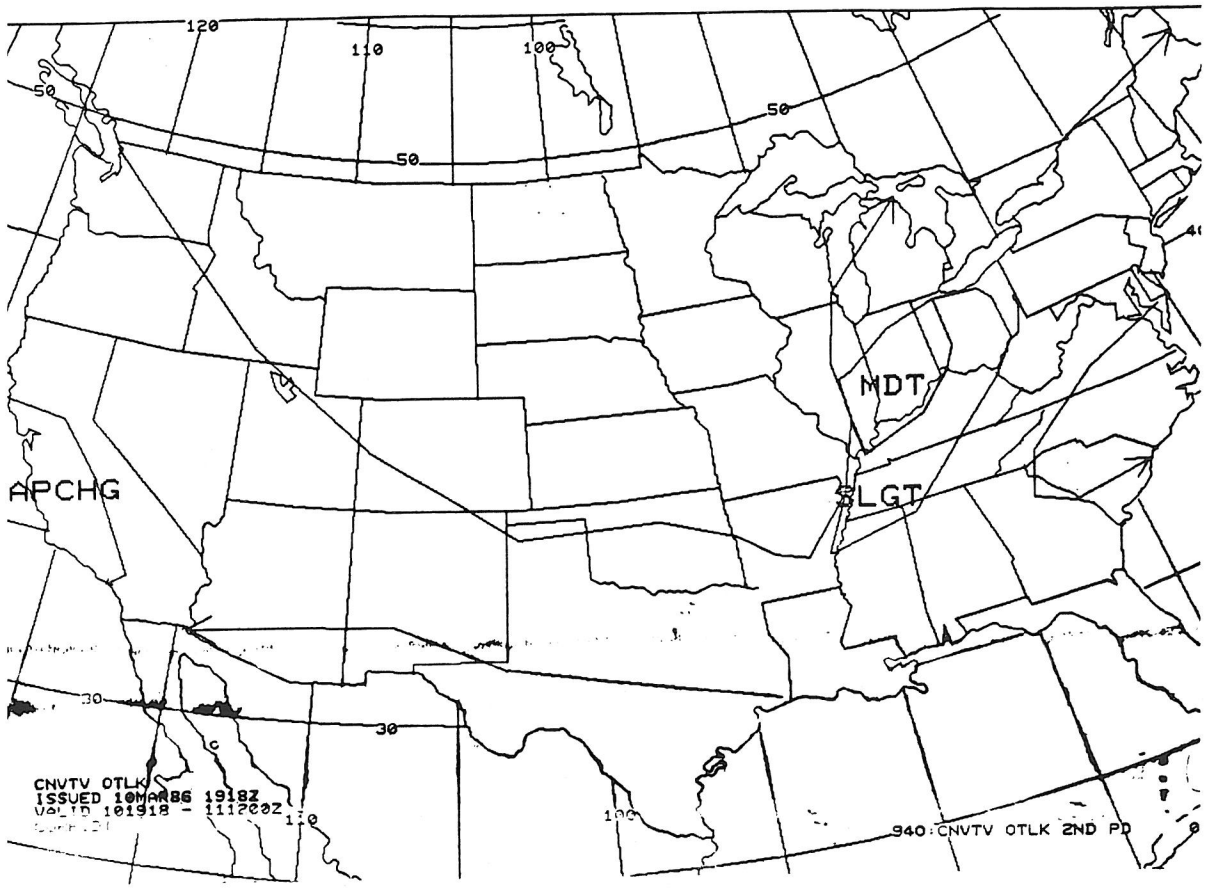

Figure 6. SELS convective outlook, valid 3/10/86, 1918Z - 3/11/86, 1200Z.

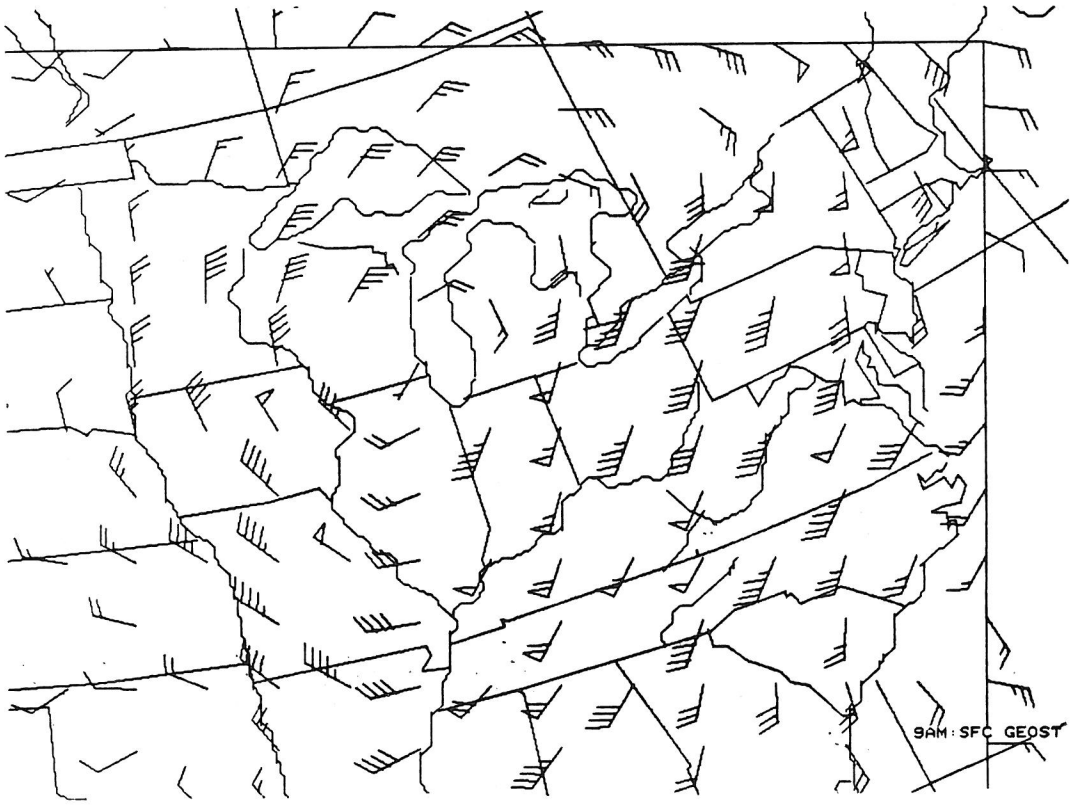

Figure 7. Surface geostrophic wind analysis, 3/10/86, 1800Z.

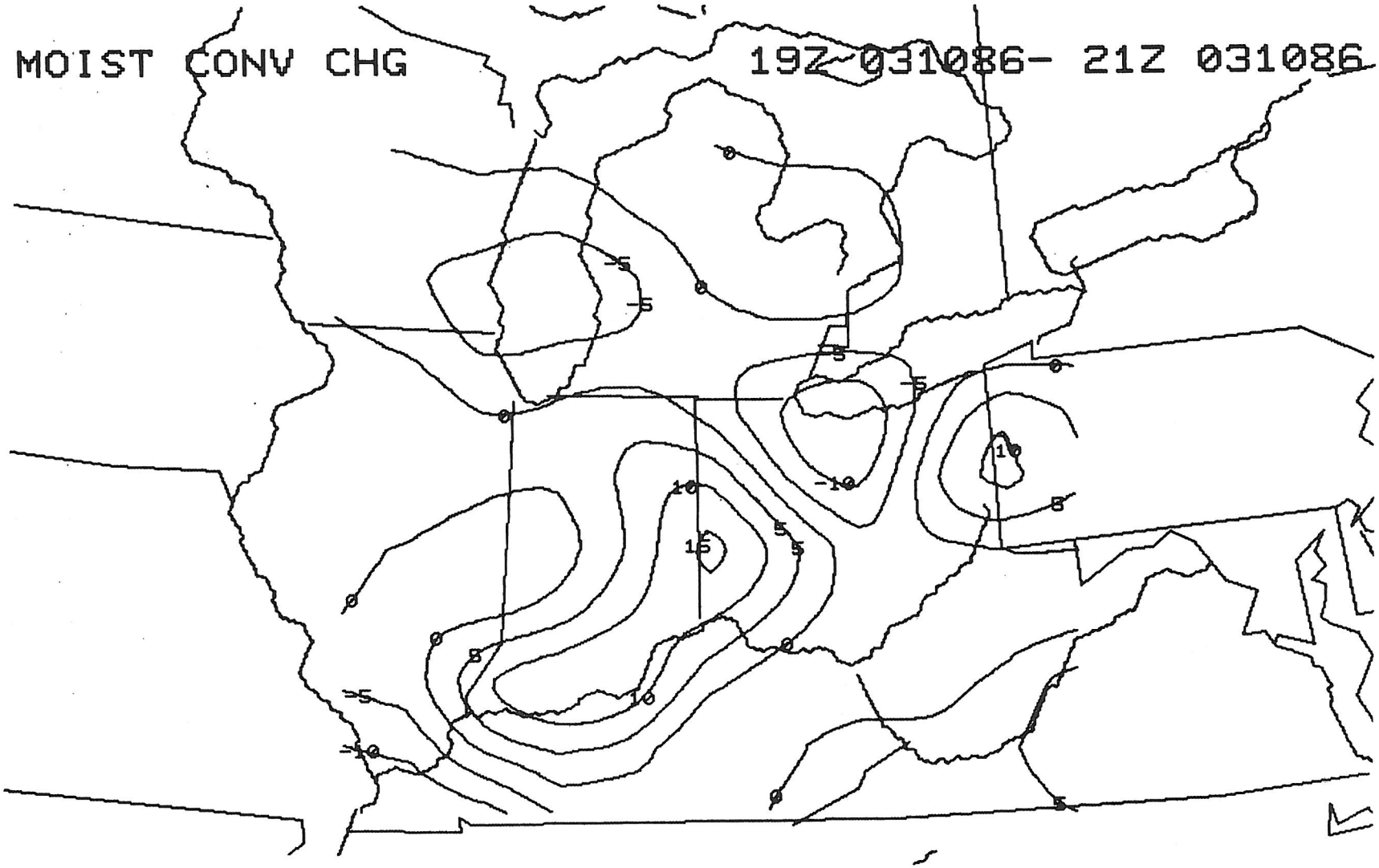

Figure 8. Change in surface moisture convergence, 1900-2100Z, 3/10/86. Algebraic signs have been reversed -- positive means increasing convergence, negative indicates increasing divergence.