

PICTURE OF THE MONTH

Cyclonic Thunderstorm Outflow?

J. M. FRITSCH AND R. A. MADDOX

Atmospheric Physics and Chemistry Laboratory, NOAA, Boulder, CO 80302

5 September 1978 and 13 October 1978

ABSTRACT

High-resolution visible imagery for the eastern GOES satellite is used to document a convectively driven mesoscale weather system which propagates against the mean atmospheric flow and produces an apparent spiraling anvil outflow.

High-resolution visible imagery from the eastern GOES satellite shows a large outbreak of heavy thunderstorms over central Kansas on 25 May 1978 (Fig. 1). Deep convection initially formed near the south-central Kansas border around 1400 GMT. After this initial development, new convection repeatedly developed throughout the day as a southerly stream of warm moist air was forced over the cold downdraft outflow from previous thunderstorm activity. The outflow boundary is clearly visible in Figs. 1–3. Although individual thunderstorms moved north with the upper level southerly flow (see Fig. 4), it is interesting that the outflow boundary and the convective system moved slowly southward against the flow.

By 0000 GMT 26 May, a well-defined mesoscale

pressure system is clearly evident in the surface analysis (Fig. 5). This system persists through the nighttime hours, merges with another convective system that moved eastward from the Texas Panhandle, and by 1200 GMT 26 May has propagated all the way to the northern Texas border (Fig. 6).

Of particular interest during the lifetime of the convective system is the thunderstorm which develops near the south-central Kansas border around 2000 GMT (see Fig. 2). An enlargement of the satellite picture reveals what appears to be a cyclonically spiraling outflow at the top of the thunderstorm (Fig. 7). Although tornadoes occurred in this region several hours later, no severe weather was reported during the lifetime of the spiraling storm.



FIG. 1. Visible GOES satellite imagery, 2132 GMT 25 May 1978.



FIG. 2. As in Fig. 1 except for 2202 GMT 25 May 1978.



FIG. 3. As in Fig. 1 except for 2232 GMT 25 May 1978.

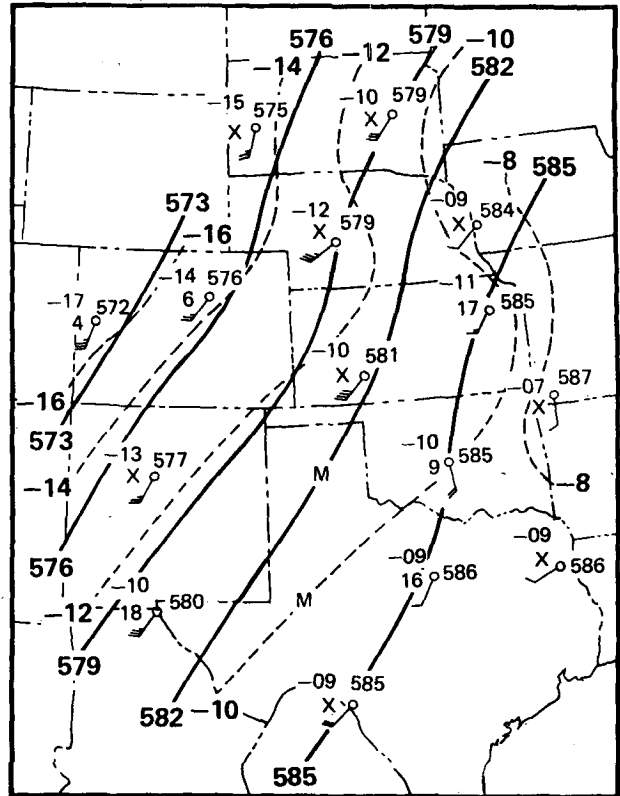


FIG. 4. 500 mb analysis 0000 GMT 26 May 1978.

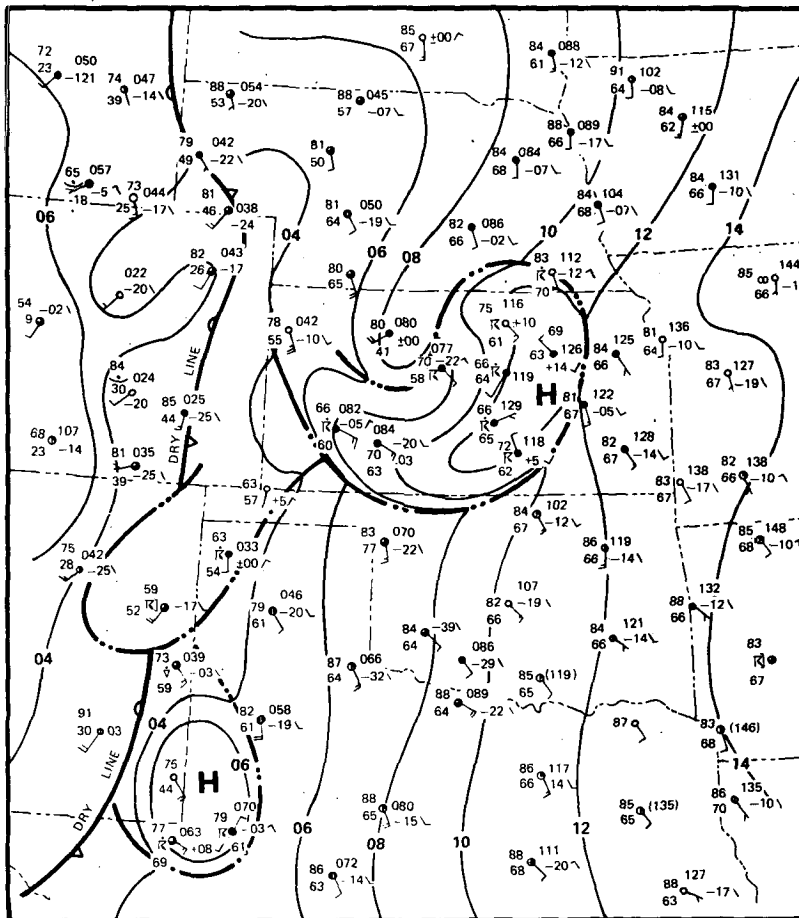


FIG. 5. Surface analysis 0000 GMT 26 May 1978.

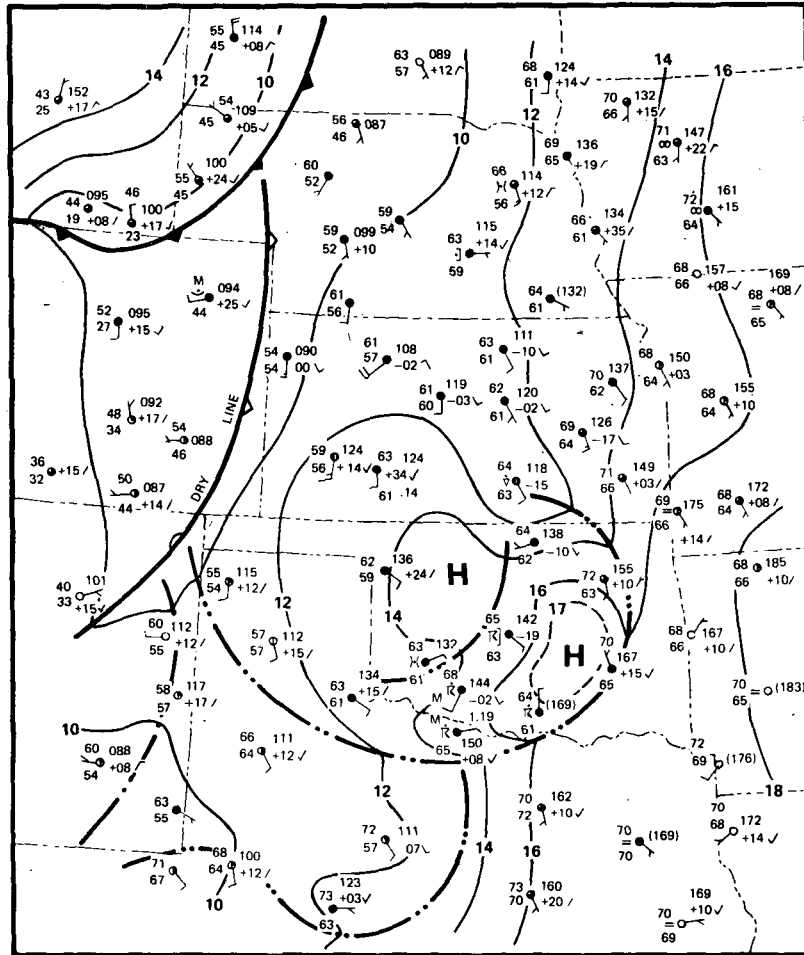


FIG. 6. As in Fig. 5 except for 1200 GMT 26 May 1978.

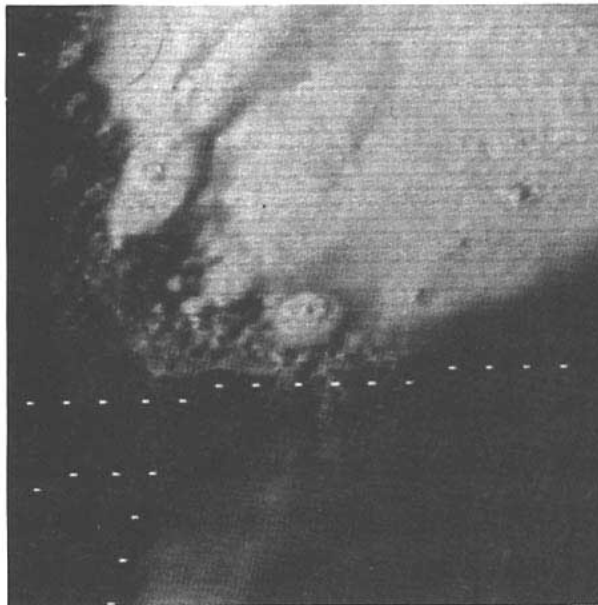


FIG. 7. Visible GOES Satellite imagery enlargement, 2202 GMT 25 May 1978.