

INFAMOUS ANDOVER TORNADO OUTBREAK

APRIL 26, 1991

How Did This Occur?

Ample moisture, impressive lift, incredible instability, and winds changing speed and direction with height (i.e., vertical wind shear) all came together to produce violent tornadoes throughout the Plains, including the F5 Andover tornado.

Near the top of the troposphere at 300 hPa (30,000 ft), the core of the strongest winds in the jet stream pushed into Kansas, providing exceptionally strong winds and lift.

The 500 hPa (18,000 ft) map showed the set up in the middle of the troposphere. It is clear the axis of the system was tilted toward the southeast, which is a sign this system

A day that will never be forgotten by Kansas residents, April 26, 1991. A day when an F5 tornado ravaged through the town of Andover, KS producing millions of dollars in damage while killing many and leaving hundreds injured.



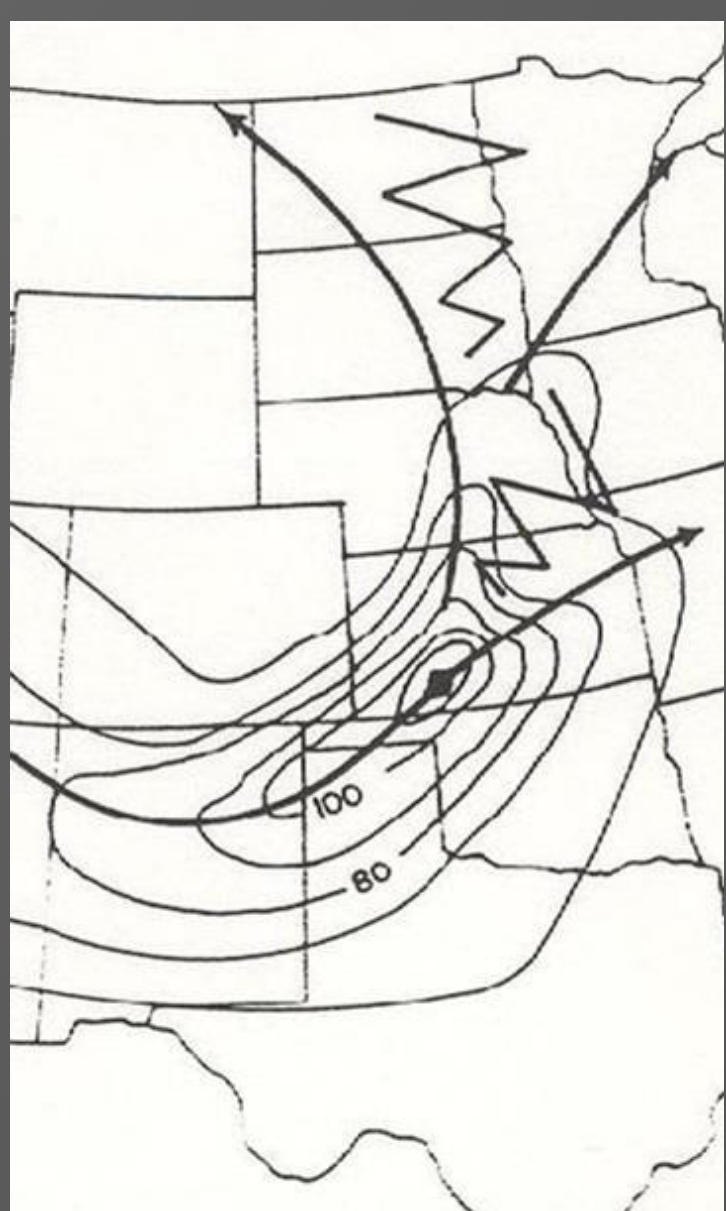
Monstrous F5 Andover tornado about to rip through a small neighborhood. Courtesy of Andover resident Earl Evans.

was mature, very strong, and had changing winds with height.

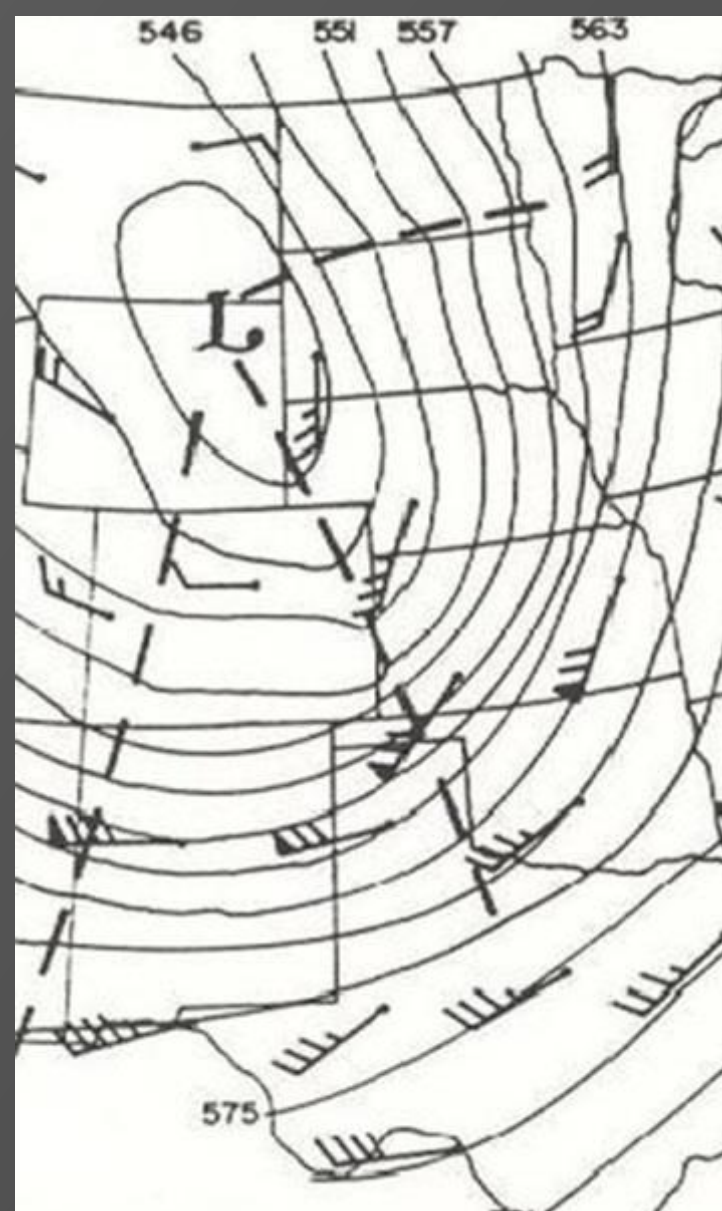
The 850 hPa (5,000 ft) map, representative of conditions just above the surface, showed a strong low level jet that was pumping in moisture ahead of the cold front and a dry line that were barreling through the region.

The evening sounding from NWS Norman was a good representation of atmospheric conditions near Andover around the time of the deadly tornado. The red and green lines show temperature and humidity. The sounding reported a temperature of 80 with dewpoint of 69 that evening, showing that much of the region was in a warm, moist environment conducive for severe weather.

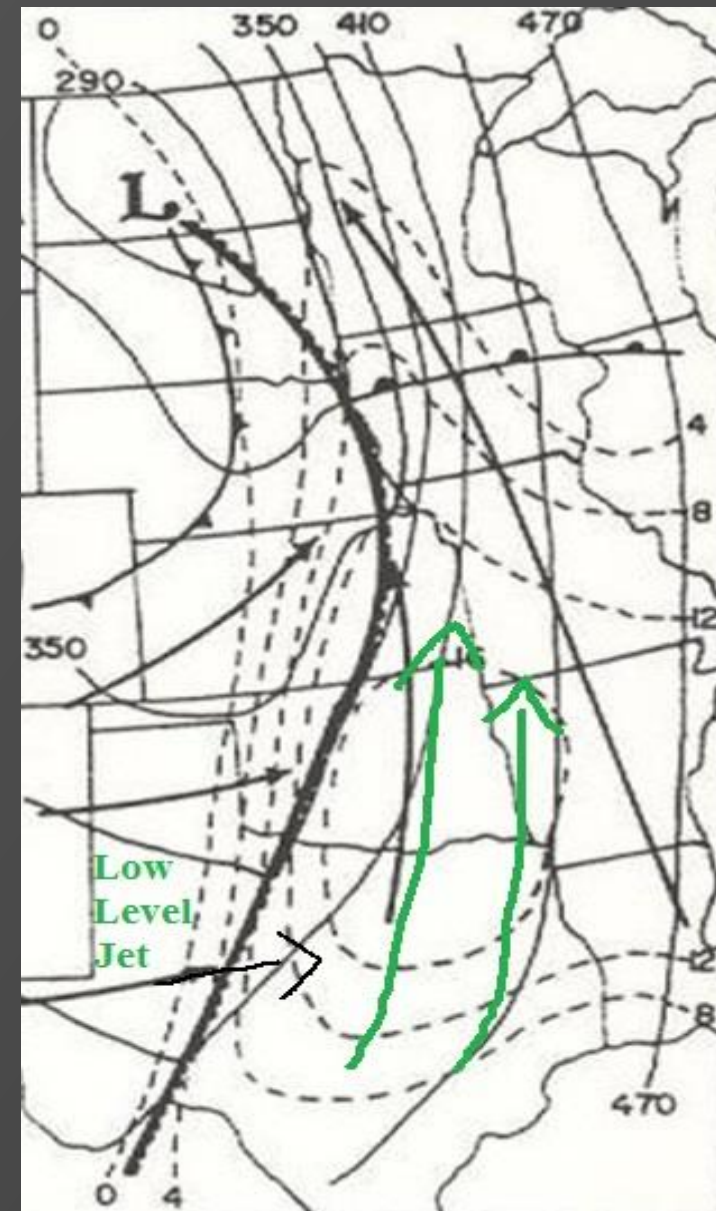
300hPa



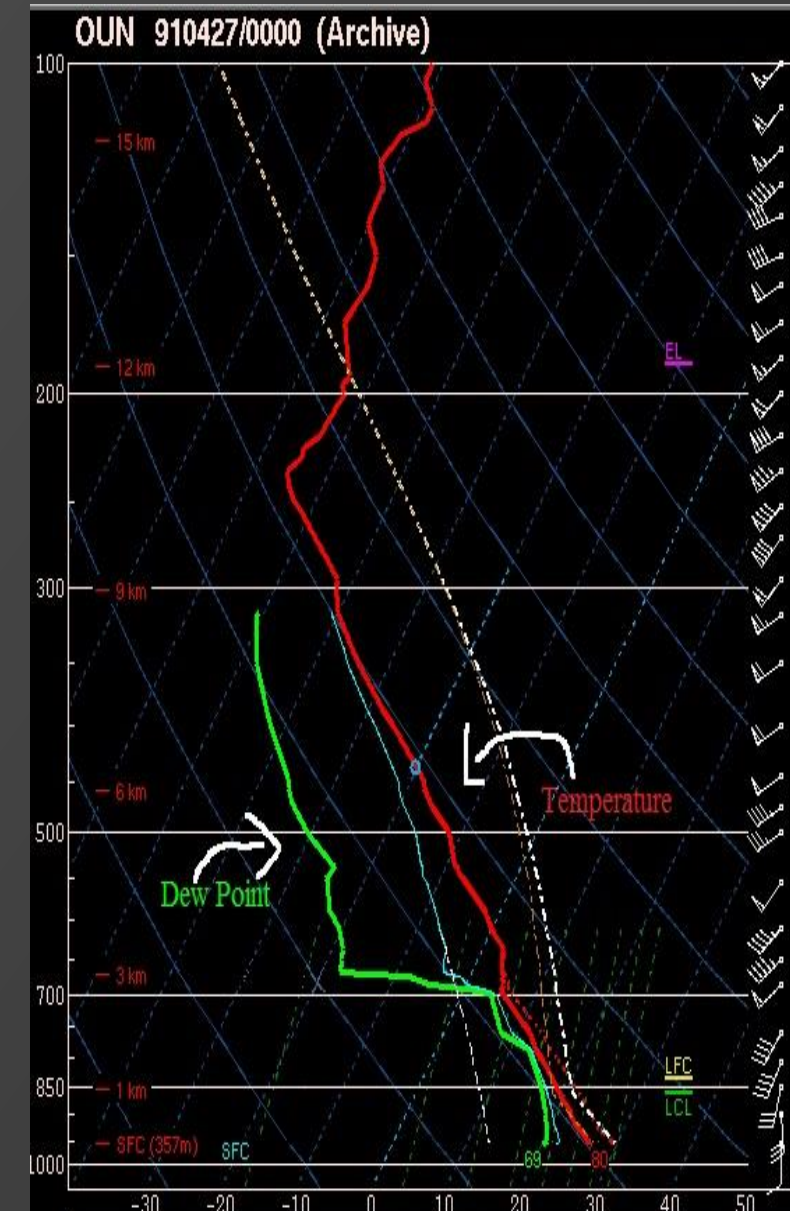
500hPa



850hPa



Sounding



F-Scale

Fujita Scale	
F-0	40–72 mph winds
F-1	73–112 mph
F-2	113–157 mph
F-3	158–206 mph
F-4	207–260 mph
F-5	261–318 mph

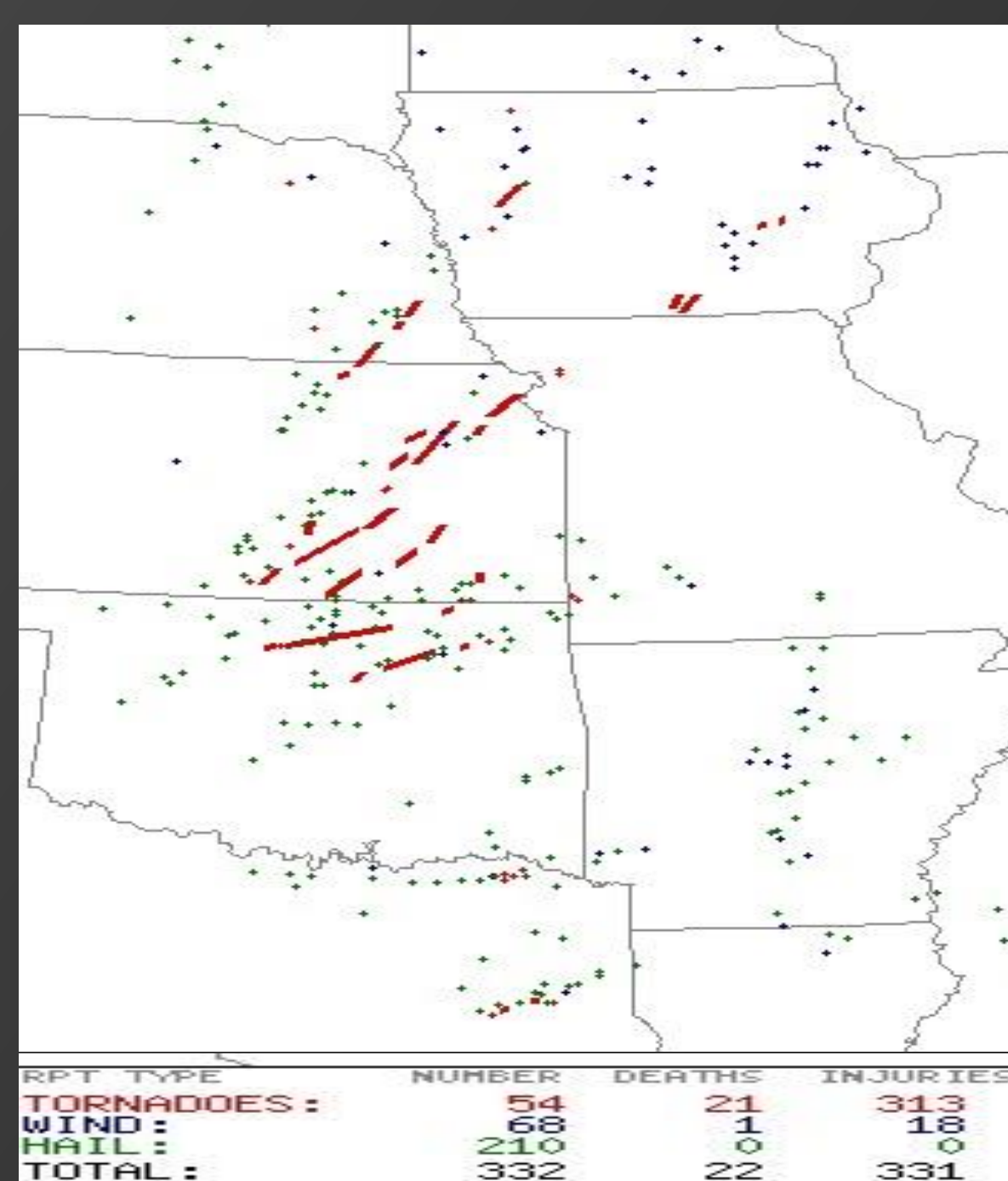
With estimated winds of over 260 mph, the Andover tornado was rated an F5 on the Fujita Scale.

Data from weather maps and an atmospheric sounding at 7 pm on April 26. Courtesy of NWS Tulsa, OK

Severe Weather Parameters

- Convective Available Potential Energy (CAPE) values exceeded 4000 J/kg, which signified that thunderstorms had incredible amounts of energy to work with and could easily grow high up towards the tropopause.
- The wind barbs on the right side of the sounding showed good vertical wind shear in the atmosphere. Winds increasing and changing direction with height were crucial for the formation of strong rotating updrafts.
- Surface dewpoints well into the 60s with much drier air aloft, as seen in the sounding, helped create optimal conditions for severe storms with large hail and tornadoes.

Storm Reports



Storm reports from 7 am April 26 to 7 am the next day. Courtesy of NWS Tulsa, OK

“It seemed like there was no way out that night, that death was going to take me” (Joe Parsley).

Survivor's Story

For Andover resident Joe Parsley, April 26, 1991 will be a day he never forgets. Parsley was one of the few lucky mobile home residents who made it out alive that evening. Not having enough time to seek proper shelter, he rode out the storm hiding under his truck. As the tornado barreled through his neighborhood, Parsley witnessed what he said to be “whole roofs coming up and bursting apart in the air, and also cars, appliances, and other things flying in air.” After the tornado picked him up and pinned him under his truck, he laid there waiting for 45 minutes before he was rescued. Parsley survived, but spent three months in the hospital with a shattered pelvis.

Aftermath and Impacts

- 24 deaths total
- 17 deaths just from the Andover tornado
- Over 300 people injured total
- Over 8,000 people from disaster relief services came to help
- More than 250 million dollars in damage throughout the Midwest
- 102 housing units in Andover destroyed
- 9 facilities destroyed on McConnell Air Force Base, including the hospital, library, and enlisted club



Andover resident looking through the rubble. Courtesy of NWS Tulsa, OK