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CENTRAL REGION TECHNICAL ATTACHMENT 87-19

EVERYDAY USE OF WIND PROFILER EVENT

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The National Weather Service and the Environmental Research Laboratories (ERL) are joining forces to install a network of thirty-one 405 MHz Doppler radar wind profilers (Fig. 1). These wind profilers will allow us to monitor winds aloft at frequent intervals. The purpose of this network is to demonstrate the effect that this type information has on warnings and forecasts.

Presently, ERL is running four profilers in a research mode. These data are available to WSFO Denver in real time. An example of their value occurred on early Tuesday morning, August 4th, when an unusually severe thunderstorm moved across northeastern Colorado affecting the area around Sterling, Fort Morgan, and Akron, Colorado. Along with heavy rain, the storm caused 60 to 70 mph winds and some damaging hail.

The wind profiler data from Plattesville, Colorado (25 miles northeast of Boulder) very clearly shows the effect of this storm (Fig. 2). During the hours around midnight (04-09Z) surface winds were from the south with speeds up to 30 kts. From about 650 mb up, the flow was from the northwest indicating that the upper level trough that was west of Denver that morning had finally passed.

The surface winds were decreasing in speed to less than 10 kts and shifting to a more southwesterly direction when the outflow of the storm passed Plattesville at about 11Z (04 MDT). The winds immediately behind the gust front were westerly, by 1200Z winds had become north-northeasterly and increased to over 20 kts. The winds remained strong till around 13Z when the back of the outflow passed and they weakened and became light easterlies.

This outflow boundary moved to the southwest where it ran into the Front Range mountains near Boulder where rain occurred between 7:00 to 9:00 a.m. It is most likely that the outflow boundary provided the uplift needed for the showers near Boulder to develop. Denver, which is only 30 miles southeast of Boulder, was unaffected by the outflow of the Akron storm and experienced no . morning showers.

This little event demonstrates the possibilities of using profiler data to not only understand small scale weather events but also to make improved forecasting. The planned profiler network will open many new doors into understanding the ways of Mother Nature in our science.

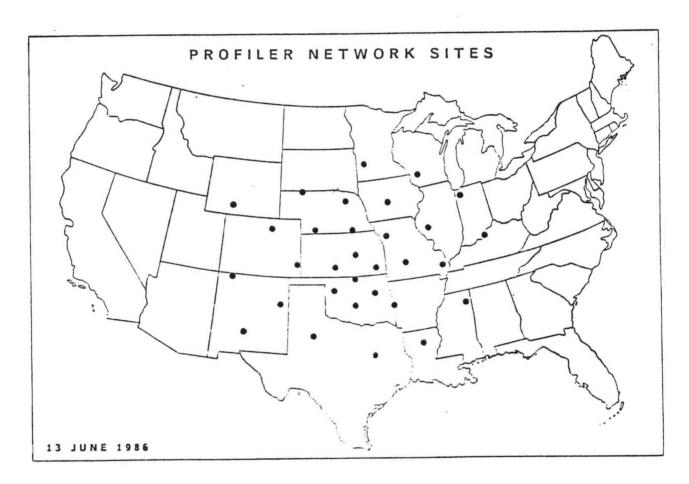


Fig. 1 Sites of demonstration wind profilers anticipated to be operating in mid-1990.

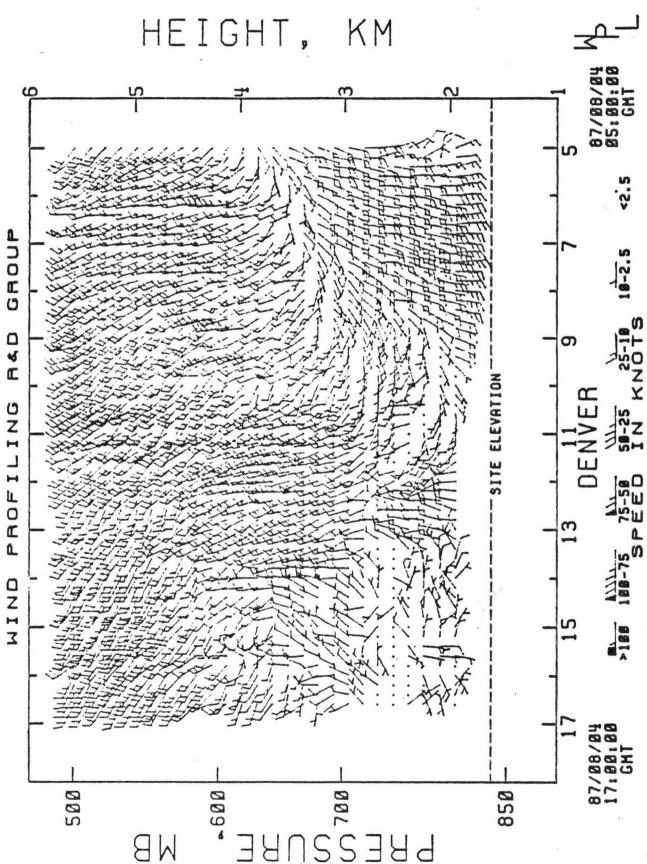


Fig. 2 August 4, 1987 twelve minute wind data from experimental profiler at Plattesville, Colorado.