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Abstract

As part of the SESAME '79 Field Program, storm and damage reports were obtained from surface, aerial and telephone surveys. Damage reports for severe weather events between 1200 GMT 10 April and 1200 GMT 11 April 1979 are presented. Exact tracks and intensities of the severe tornadoes in the Red River Valley have been prepared.

1. Introduction

The Severe Environmental Storms and Mesoscale Experiment (SESAME) is a multiagency cooperative research project designed to illuminate aspects of severe storm phenomenology encompassing several scales of motion. The SESAME '79 Field Program brought together resources to acquire data on a regional scale during April and on a storm scale focusing in Oklahoma during May and early June. The first and most meteorologically violent Regional Scale Day (see Alberty *et al.*, 1979, for definition) was 10 April. On that day, there were 89 severe weather events (tornadoes, wind $\geq$50 kt, or hail $\geq$0.75 in) with four killer tornadoes, including the one that devastated the southern part of Wichita Falls, Tex.

2. Data source

Effort was made during SESAME '79 to obtain the most complete severe weather summary possible. In addition to the standard sources of newspaper clippings and storm data, extensive telephone surveys of County Civil Defense Directors were made over all of the storm-affected area. When the magnitude of the event warranted, surface and/or aerial surveys were performed by National Severe Storms Laboratory and University of Chicago personnel.

For the storms of 10 April, approximately 150 work hours were spent in telephone surveys of Oklahoma, Kansas, Arkansas, and Louisiana. Texas officials would not allow telephone surveys of its County Civil Defense Directors. This void was admirably filled by help from National Weather Service Offices in Texas and the North Texas Disaster Preparedness Specialist, Al Moller. Ten surface and five aerial survey crews examined damage paths in northern Texas and Oklahoma.

3. Severe weather summary

The map of 10 April damage events (Fig. 1) shows two swaths of damaging storms. The first began in northwestern Texas during mid-afternoon, spread across the Red River into southern Oklahoma by dark and ended in eastern Oklahoma after midnight. (A complete chronological listing of events is available in the SESAME 1979 Operations Summary.) The second swath began in western Texas during the evening and continued northeastward across northcentral Texas during the night.

The strongest storms and worst tornadoes occurred in the northern swath during the late afternoon and have been termed the Red River Valley Outbreak. A detailed damage map (Fig. 2) indicates the significant tornado tracks and F-scale intensities (Fujita, 1973).

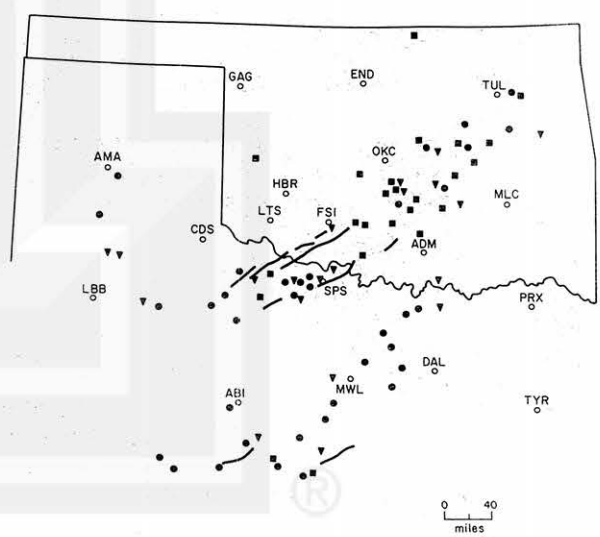

FIG. 1. Damage events of the Red River Valley Outbreak of 10 April 1979.

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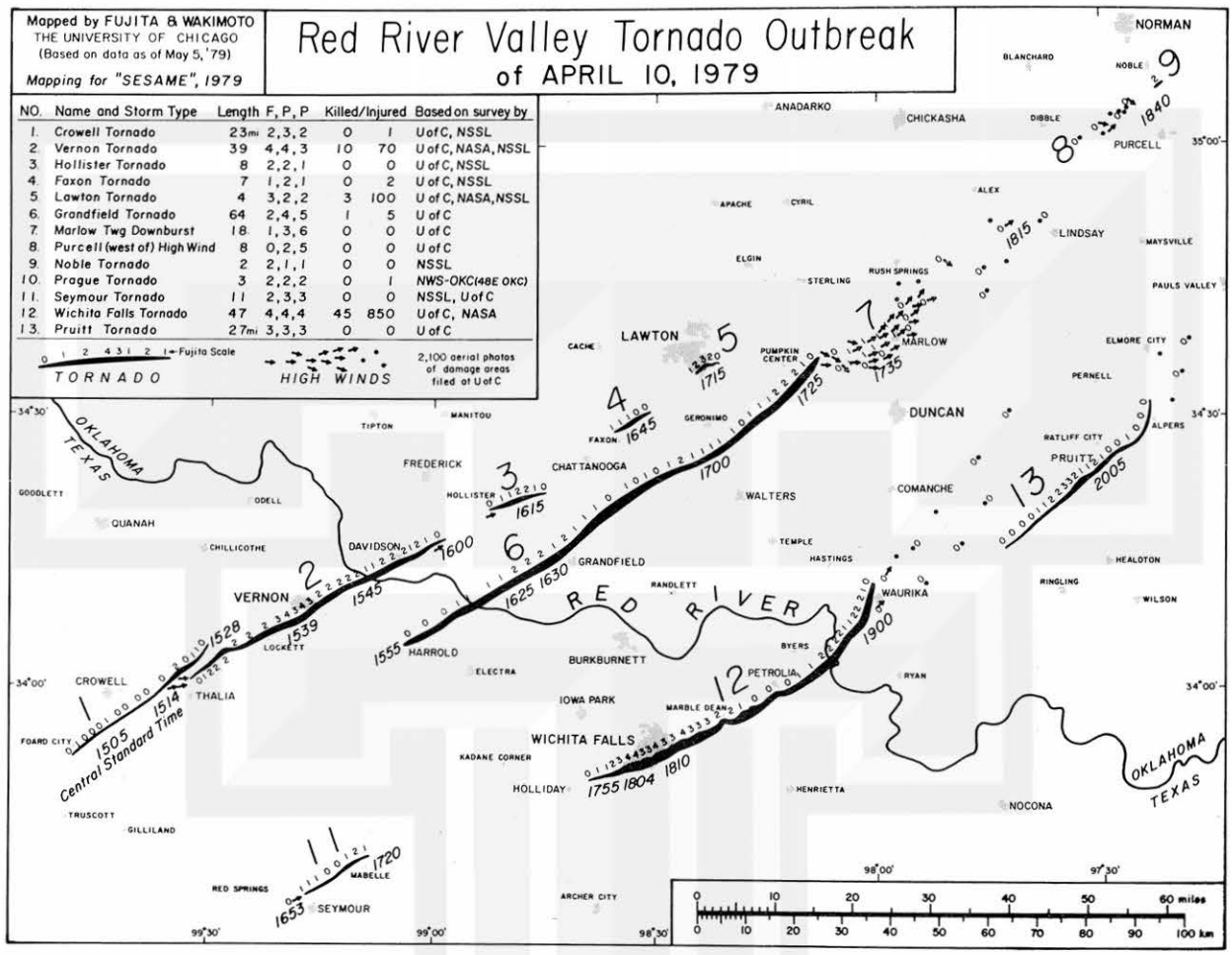

FIG. 2. Significant tornado tracks and F-scale intensities of the Red River Valley Outbreak of 10 April 1979.

The aerial survey and photography of the outbreak areas were conducted on 12 and 13 April as soon as a blowing duststorm on the 11th was over. Thirteen swaths of damaging winds, including 12 tornadoes, were confirmed (Fig. 2). The original map in color is available upon request.

The storm time (CST) shown along storm tracks was estimated by NSSL with an accuracy of 1–5 min. Numbers 1–4 next to each tornado path denote F-scale intensities, which were estimated from a low-flying Cessna. By definition, the estimate error of F-scale values is ±1. However, the scale value could be underestimated if there were no objects to be damaged, such as was the case for parts of the Seymour, Tex., tornado track.

The total path length of the 11 tornadoes in the figure is 235 mi. There were two F4 storms identified: the Vernon and Wichita Falls tornadoes. The Grandfield tornado (F2) was a large tornado that left behind a 64 mi long path.

4. Conclusion

Good damage verification is available to combine with data now undergoing analysis at several locations. Later reports will certainly present more complete analyses of several SESAME data sets. This brief paper is intended to further document storm events. Interested parties may contact the authors for further information.

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