

Climatic Variation of Storms

Principal Investigator: Ted Fujita

The University of Chicago
5734 Ellis Avenue
Chicago, IL 60637

TEL: (312) 702-8112
FAX: (312) 702-0305

Significant Accomplishments, August 91 - April 92

Long-term variation of U.S. tornadoes were studied by obtaining the best possible data during the 75 years, 1916-90. The most difficult task was to estimate the number of early tornadoes in 1916-50 when the reporting efficiency was very bad, resulting in undercounting of the incidents. In generating the best possible data, Fujita's Tornado Tape produced at the University of Chicago, the book "Significant Tornadoes, 1880-1989" by Thomas P. Grazulis, and the NSSFC Tornado Tape were combined.

First, the "Annual Number of Tornadoes" were smoothed to obtain the "Smoothed Number of Annual Tornadoes" which was normalized to the "Standard Number of Tornadoes" defined as the mean number in the recent 30 years, 1960-89. The "Normalization Factor" was obtained by computing the ratio of smoothed and standard number. In the early years, the factor was in excess of 7.

Thereafter, the "Normalized Number of Annual Tornadoes" was computed and plotted, finding that the results are very satisfactory.

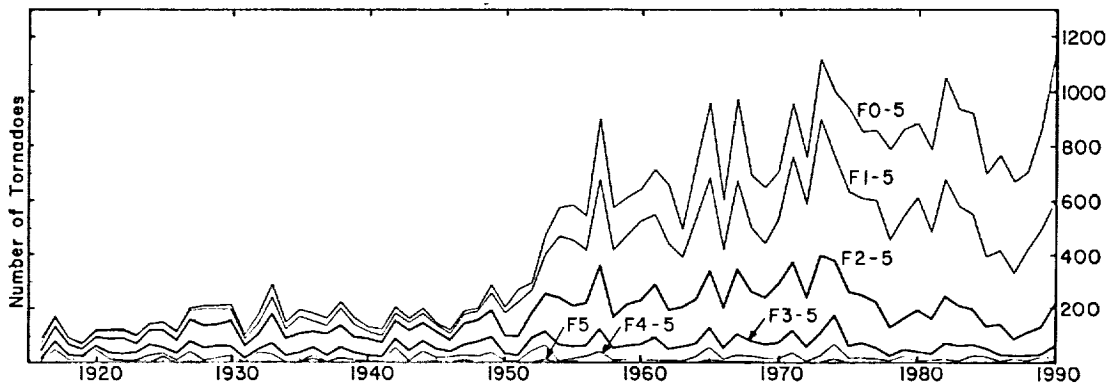
In order to visualize the variation of tornado activities, the "Tornado Activity Number (TAN)" was initiated and computed. The TAN including all annual tornadoes show certain periodicity. For climatological evaluation, the peak-activity day of each year, such as Superoutbreak day, 3 April 1974, Palm Sunday, 11 April 1965 were eliminated. The TAN, excluding peak-day tornadoes, is of extreme interest.

Plans for Next Year

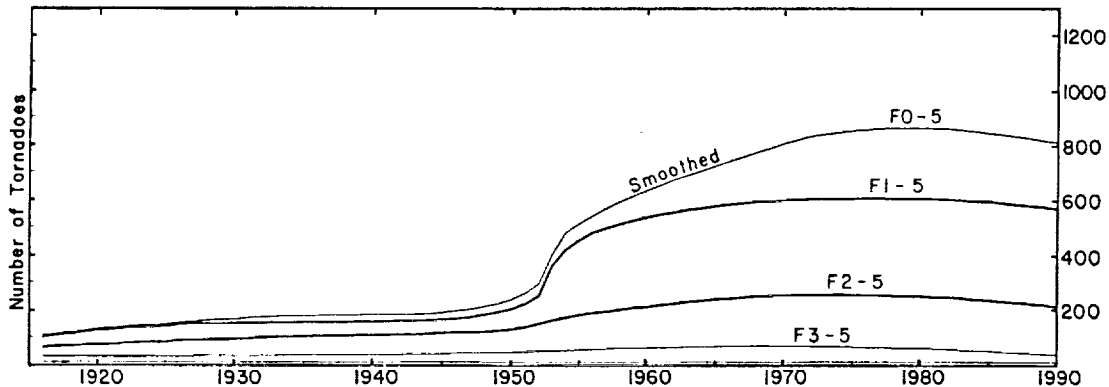
This study will continue in an attempt to relate tornado activities with other climatological events such as El Niño, La Niña, sunspots, etc.

Meanwhile, individual case studies and synoptic analyses of special cases will be performed for better understanding of tornado climatology.

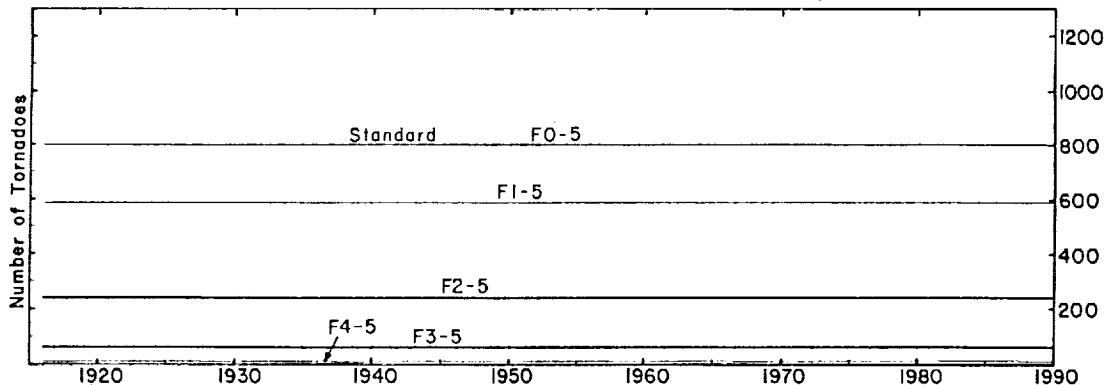
Annual Number of Tornadoes



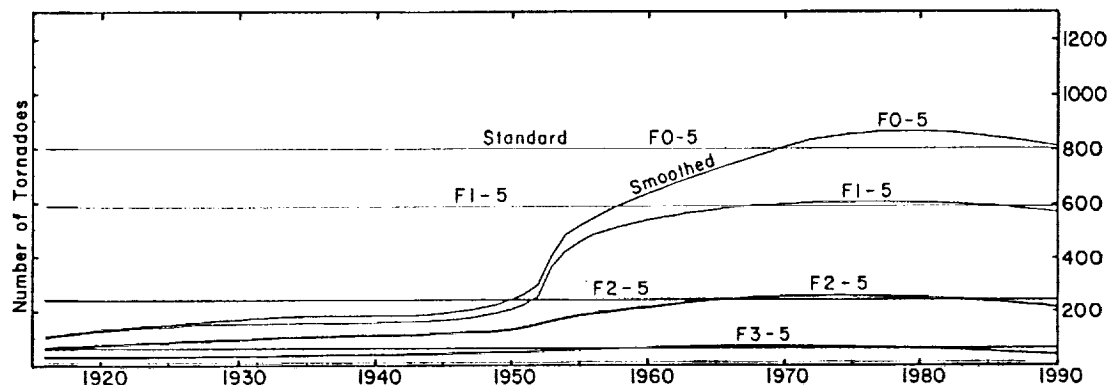
Smoothed Number of Annual Tornadoes



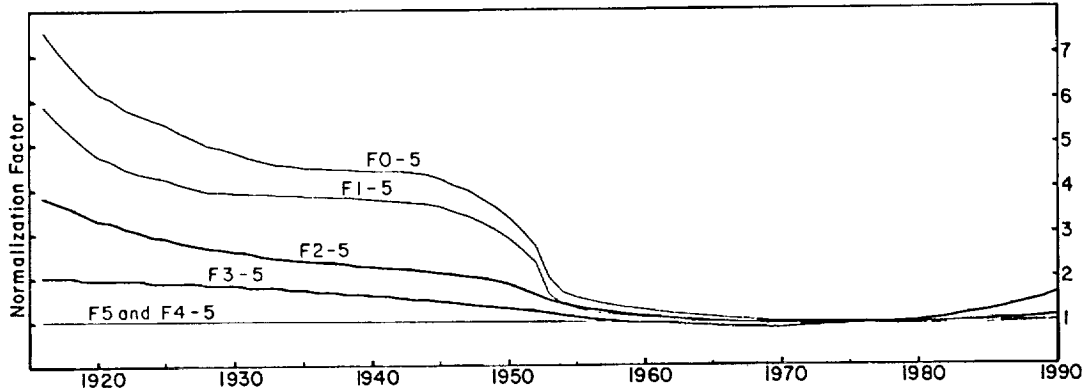
Standard Number or the Mean Number in 30 Years, 1960-89



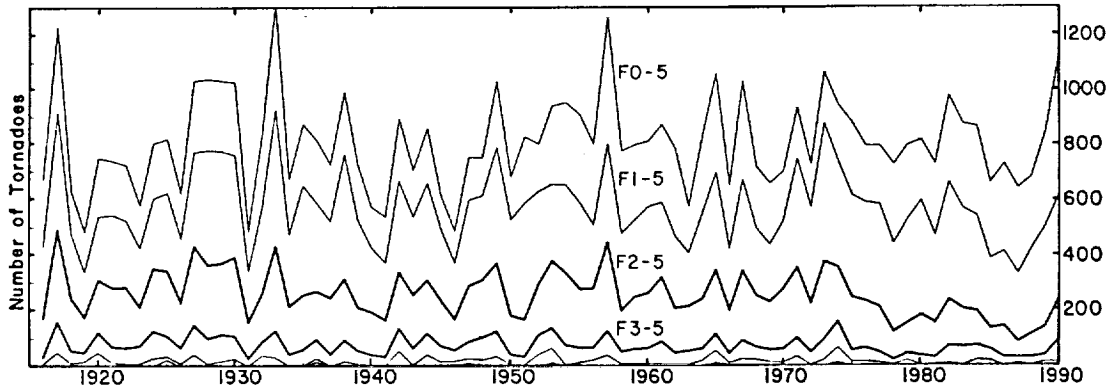
Smoothed and Standard Number of Tornadoes Combined



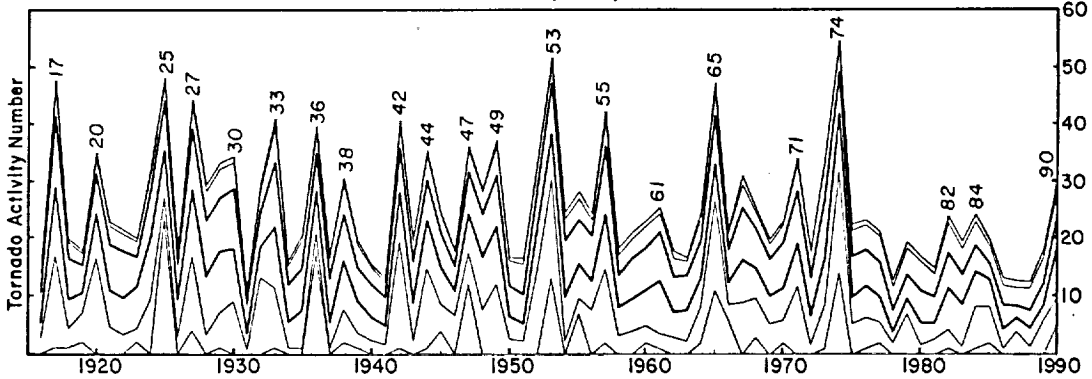
Normalization Factor



Normalized Number of Annual Tornadoes



Tornado Activity Number (TAN) of Annual Tornadoes



TAN excluding Tornadoes on One Peak Day

