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FREDERICK H. MUELLER, *Secretary*

WEATHER BUREAU

F. W. REICHELDERFER, *Chief*

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Tornado Occurrences in the United States

LAURA V. WOLFORD

Office of Climatology



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1. The first of the two main parts of the report is a description of the current situation in the country. This part is divided into two sections: a general overview and a more detailed analysis of the main problems. The second part of the report is a proposal for a new strategy to deal with these problems. This part is also divided into two sections: a general overview and a more detailed analysis of the main proposals. The report is written in a clear and concise style, and it is easy to read. It is a very good example of a well-written report.

Tornado Occurrences in the United States

Laura V. Wolford
Office of Climatology
U. S. Weather Bureau, Washington, D. C.

PREFACE

This revision of the first edition of Technical Paper No. 20 extends the data to include the years 1951 through 1958 and contains additional textual material, tabulations, and charts.

The primary purpose of this publication is to bring up to date the available records of all tornadoes in the United States in order to provide more useful information to the public and to business, commerce, and industry in general regarding the usual frequency of tornado occurrences in the different sections of the country.

The systematic recording and reporting of tornadoes by the Weather Bureau began in 1916. The detailed statistics presented herein relative to areal distribution, hours of occurrence, loss of life, property damage, and frequency of occurrence are based on the 43-year period beginning with 1916 and extending through 1958. Funnel clouds aloft and waterspouts are presented in separate tabulations and are not included in the tornado summarizations.

It is impractical to make an accurate comparison of recent tornado data with reports of previous years, particularly in regard to number of tornadoes, tornado days,

and property damage, because of population growths, increased alertness to and general interest in these storms, advances in observational techniques, and changes in monetary value of property.

Grateful acknowledgment is made to State Climatologists and other U. S. Weather Bureau personnel at field stations; to the tens of thousands of cooperative observers and other public spirited persons over the country who, through their interest and cooperative efforts for several generations, have provided the basic data; to Dr. Helmut E. Landsberg for general guidance and review; to Messers Lilburn H. Seamon, Robert W. Schloemer, and Milton L. Blanc for valuable comments; to Miss Marjorie A. Clark of the Weather Bureau Library for assistance in research; to the Drafting Section of the Weather Bureau for drafting the figures and charts; and to Mrs. Lola M. Starbuck and Mr. William T. Pullen for assistance in the preparation of copy for publication. Planning and preparation of this publication were under the direct supervision of Mr. John L. Baldwin, Chief of Domestic Area Section, Office of Climatology.

SOURCES AND RELIABILITY OF DATA

The tornado statistics presented herein are based upon regular monthly and annual reports of tornadoes prepared by Weather Bureau State Climatologists or Meteorologists in Charge responsible for reporting such storms in specific areas (usually a single State, but in some cases consisting of two or more States). During the 43-year period (1916-1958) covered by this summary, all State Climatologists and Meteorologists in Charge were operating under instructions to depend upon only the most reliable and unbiased sources of these data. The principal sources have been local Weather Bureau offices, the American National Red Cross, Cooperative Weather Observers, State Insurance Companies, and Federal, State, County, and Municipal offices. Weather Bureau officials responsible for reporting these data are instructed also to investigate and fully verify reports of all unusual

storms such as tornadoes before classifying them. The storms recorded here as tornadoes were so classified only if the characteristic funnel cloud was plainly seen, or subsequent examination of the destruction clearly indicated the characteristic whirling motion of the winds, the bursting effects on buildings, or the sucking up of objects into the air as the storm passed. It is realized, of course, that the judgment of field classifiers of such storms is not infallible, especially in borderline cases. It is also true that some tornadoes occur in areas either uninhabited or where there is no vegetation to indicate the occurrence, so that some have gone unrecorded. It is evident, however, that the increase in the number reported during recent years, particularly since 1951, is due to increased public awareness of tornadoes, establishment of extensive

reporting and warning networks, improved methods of tracking tornadoes, better communication facilities, and increases in population.

A table of monthly severe storm reports, including tornadoes, was published in the Monthly Weather Review from June 1921 through December 1949. Since 1949, these reports have been published in the Climatological Data National Summary. Annual summaries of tornado occurrences were published in the Report of the Chief of the Weather Bureau from 1916 through 1934, in the United States Meteorological Yearbook from 1935 through 1949, and in the annual

issue of the Climatological Data National Summary from 1950 through 1958. These publications constitute the principal sources of data for this summary. (Beginning in 1959 tornado reports are included in the separate publication, Storm Data, each month.)

In the compilations of these statistics, questionable cases were referred back to Weather Bureau officials for further investigation. If some of the known characteristics of tornadoes were not found in the original records and notes made at the time of occurrence, the storm in question was not included in this summary.

TORNADOES OF EARLY YEARS

Records of tornadoes in this country prior to about 1875 are necessarily meager, for several reasons--lack of settlements in many areas, poor communication facilities, and absence of any organized plan for reporting. In early days, the reporting system caught only the major and more spectacular cases. Thus, the greater number of tornadoes reported in recent decades and particularly in the last 6 years does not necessarily indicate that tornadoes are becoming more frequent.

In the literature on the subject, there are references to approximately 150 tor-

nadoes which occurred in the United States during the period 1682-1874. The earliest one for which an authentic record exists occurred on June 10, 1682, at New Haven, Conn.[1]. Reports of tornadoes west of the Appalachian Mountains first appeared about 1805 and in the western Great Plains about 1859.

By the year 1875, more reliable and detailed reports of tornadoes became available. A selected list of 146 of the more outstanding of these storms that occurred during the period 1875-1958 is shown in table 1.

TORNADO CHARACTERISTICS

The tornado, one of the most destructive of storms, is characterized by rotary movement of extremely high-speed winds within a relatively small storm circulation pattern. It frequently leaves great destruction along a narrow path, and is usually accompanied by heavy rain and hail, and often by lightning and thunder. A distinguishing feature of the tornado is the funnel-shaped cloud which frequently appears to hang from a heavy cumulonimbus cloud aloft. This funnel cloud often rises and falls, turns and swings in various directions before touching the earth's surface. The sound of roaring wind is also characteristic and pronounced. Some eyewitness descriptions are given in a later portion of this paper.

Tornadoes are barometric depressions roughly resembling the larger air mass circulations known as cyclones, but are very much smaller and of much shorter life, with much steeper pressure gradients and terrifying wind speeds. The word tornado probably came from the Spanish "tronada," a thunderstorm, or "tornar" meaning to turn or to twist. English sailors used a similar

word, spelled in various ways, to describe severe local storms along the west coast of Africa and on tropical seas.

The very strong updraft of air in the tornado's funnel, which gives rise to furious in-blowing winds at and near its perimeter, is generally the cause of first destruction, and as the funnel drops toward the earth, objects appear to be sucked up, ascending spirally. Some persons who have lived through the passage of a tornado speak of a bursting sensation in their ears and chest. This is due to the partial vacuum, which is formed in the tornado funnel. The pattern of uprooted trees and scattered debris along the tornado path usually gives evidence of counterclockwise whirl around this partial vacuum as the storm moves along.

The amount and nature of the fall in atmospheric pressure inside a tornado funnel probably varies greatly from storm to storm. When a roofed enclosure, such as a house filled with air at normal pressure, is suddenly encompassed by the funnel of a tornado, the reduction in the surrounding outside air pressure causes the internal

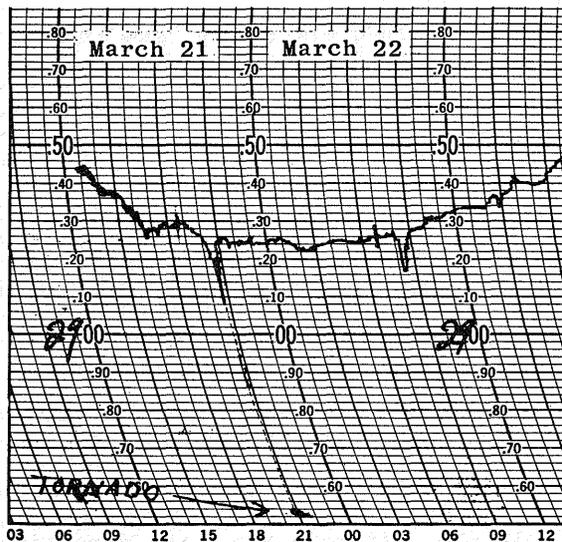


Figure 2.--BAROGRAM AT DYERSBURG, TENN., MARCH 21-22, 1952

A more recent pressure record, associated with the passage of a tornado, was obtained at the Dyersburg, Tenn., Airport on March 21, 1952. From a subsequent survey of the path of destruction it was estimated that the center of this storm was approximately 40 yards north of the barograph when a sudden drop of about 0.65 inch was recorded. A study of this storm was made by Carr [3]. A print of the barograph trace is shown in figure 2.

RATES OF TRAVEL AND INTERNAL WIND SPEEDS.-- Tornadoes usually move at a speed of about 40 m.p.h., a very slow rate compared with the rotary speed of winds within the tornado, which have been estimated to exceed 200 m.p.h., and possibly 500 m.p.h. Forward speeds ranging from stationary to as high as 68 m.p.h. (in Indiana during the tri-State tornado of March 18, 1925) [4], have been observed. Recorded rates of forward movement of 60 m.p.h., or over for some tornadoes are: 65 m.p.h., on May 25, 1917, from Grenola to Uniontown, Kans.; 60 to 65 m.p.h., on March 15, 1938, at Batesville, Ill.; 60 to 61 m.p.h., on April 19, 1927, in Macoupin, Morgan, and Sangamon Counties, Illinois; and 60 m.p.h., on April 30, 1954, in the tornado which moved 180 miles from Sturgeon, Mo., to Kahoka, Iowa. Probably the slowest moving tornado (only 5 m.p.h.) occurred at Pratt, Kans., on May 24, 1930, although a few tornadoes have been observed to remain stationary for several minutes while the air composing them continued to whirl at tremendous speeds. The greatest wind speeds within the tornado are reached to the right of the path of forward motion. Although rotary wind speeds within a tornado funnel have been estimated to be as high as 500 m.p.h., the maximum speeds of these

whirling internal winds have never been measured directly and it is doubtful that any anemometer would survive such a test. Several calculated estimates have been made, however, from the effects produced upon objects by the high winds.

One such calculation by Loomis [5] after the tornado of February 4, 1842, at Mayfield, Ohio, was made when he found small pieces of boards with blunt ends driven into the turf to a depth of 18 inches. After making several experiments and by comparing the depth and force involved, he concluded that winds in this storm must have reached a speed of 682 m.p.h. A comparable speed in excess of 550 m.p.h., was given by Bigelow [6] for winds in the great tornado which passed across St. Louis, Mo., on May 27, 1896. Van Everdingen [7], on the other hand, writes, "all calculations of the force of wind from the pressure of the wind, estimated from its destructive effects, yield too high values, because it is certain that other forces of the same order of magnitude must have been present at the same time." However, most authorities on the subject agree that extremely high wind speeds near the whirling centers of all tornadoes are the chief cause of their destructive effect. The Weather Bureau's experimental Doppler radar equipment, a device which permits direct measurement of the high speeds in a spinning tornado funnel, received its first big test in the Wichita Falls, Tex., tornado of April 2, 1958. This was the first tornado tracked by the Doppler radar, and for the first time in history rotating winds up to 280 m.p.h., were clocked. The Doppler radar principle is used commonly for speed monitoring work by highway police, and could prove very valuable in locating and tracking tornadoes.

DIRECTION OF MOVEMENT.-- Surface winds in connection with developing tornadoes are usually from the southwest, and most tornadoes move from that direction (see tornado tracks in charts 1-13). Tornadoes, however, have been known to come from almost any direction, even stopping their forward movement, turning, and looping their path. For instance, the tornado of June 15, 1942, in Buchanan County, Iowa, caused widespread destruction in a crescent-shaped path curving from a southeasterly direction through south, west, and northwest to northeast. Also in 1942, a tornado at Oklahoma City, Okla., on June 12, moved southeastward, curved to the southwest, then recurved to the east, moved northward, and finally westward, its path describing almost a complete circle. A tornado on June 27, 1946, made a circuitous path from Windsor, Ontario, to Detroit, Mich., and another tornado on June 2, 1949, circled an area of 1-mile radius in Caddo County, Oklahoma.

A number of other tornadoes have described semicircular paths or have abruptly changed their direction of movement by 30° to over 45°. The tornado rose presented in figure 3 shows that about 58 percent of these storms moved from southwest to northeast and slightly over 87 percent came from some westerly direction.

LENGTH AND WIDTH OF PATHS.--The tornado, although very destructive to life and property, is one of the smallest of serious weather disturbances, and is limited in duration as well as in the length and width of its path. The cloud may touch the ground only in a very narrow and short path and sometimes strikes the surface only at intervals as it moves along in a skipping fashion. In other cases, the storm may persist for hours, with a path of destruction several hundred yards wide and up to 300 or more miles long. The average width of tornado paths in the United States for the past 10 years is about 250 yards. Of the 2,288 tornadoes giving data on the lengths of paths during the 10-year period,

1949-58, 10 percent traveled for distances of less than 1/2 mile, 42 percent from 1/2 to 5 miles, 16 percent from 5 to 10 miles, 15 percent from 10 to 20 miles, and 17 percent exceeded 20 miles, the median length being 5 miles.

Two tornadoes crossed Georgia and South Carolina on March 20, 1875, with paths of 375 and 350 miles respectively [8]. There were, however, several gaps in these long paths where no destruction occurred, indicating that the funnels either failed to touch the ground in those areas or that the path in each case may have been made by more than one storm. On April 29, 1909, a long path in Tennessee extended for 315 miles, but reports of this storm do not indicate whether the path was continuous or interrupted by breaks. These three paths appear to be the longest of which we have any record. During the 43-year period of tabulation of these storms by the Weather Bureau, no tornado path of 300 miles or over has been reported and only nine have moved for distances of 200 miles

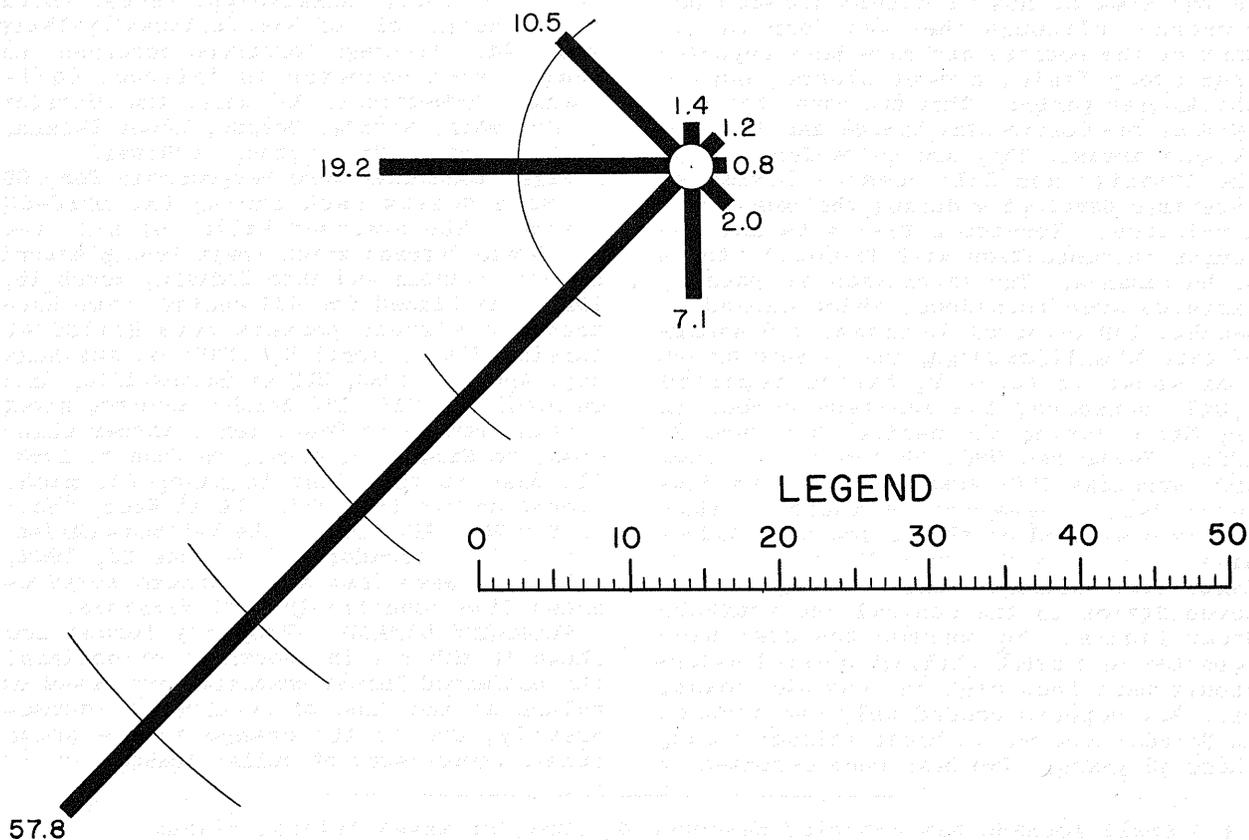


FIGURE 3.—TORNADO ROSE FOR UNITED STATES, GIVING PERCENTAGE OF TORNADOES MOVING FROM INDICATED DIRECTIONS. BASED ON 5746 TORNADOES, 1930-58.

or more. The Mattoon-Charleston, Ill., tornado of May 26, 1917, had the longest officially reported path of 293 miles, 188 miles in Illinois and 105 in Indiana. The next two longest paths extended for 240 miles each, one in Arkansas on December 21, 1947, and the other from Louisiana into Mississippi on November 5, 1948. The path of the Woodward, Okla., tornado of April 9, 1947, stretched across parts of Texas, Oklahoma, and Kansas, a total distance of 221 miles. A tornado on March 22, 1953, moved 180 miles across Louisiana and 40 miles into Mississippi for a total of 220

miles. A tri-State tornado with a path 219 miles in length traveled from Missouri, across Illinois, and into Indiana on March 18, 1925. Another tri-State tornado on April 17, 1922, traveled 210 miles over Illinois, Indiana, and Ohio. A 210-mile path extended from North Dakota into Minnesota on July 3, 1947. A South Dakota tornado on May 27, 1942, moved for 200 miles in that State.

Among the narrowest paths of tornadoes was one only 9 feet wide in North Carolina in 1940, and one of the shortest, only 45 feet long, occurred in Wyoming in 1954.

TORNADO STATISTICS

DISTRIBUTION OF TORNADO OCCURRENCES.--The areal distribution of the 9,167 tornadoes reported in the United States from 1916 through 1958 is presented by months in charts 1 through 12. Chart 13 shows tracks of all tornadoes reported during the 6-year period, 1953 through 1958. The great central and southern plains east of the Rocky Mountains in the United States is the area of most frequent tornado occurrence, although they may form in any part of the country and have been reported from every State, except Alaska, during the 43-year period. They are rare, however, west of the Continental Divide and in mountainous areas. They are quite frequent in the Atlantic and Gulf coastal lowlands, sometimes developing during the passage of hurricanes. Tornado activity is not uncommon in connection with tropical storms or hurricanes. The tabulation on page 36 lists 99 such tornadoes, which caused 14 deaths, 189 personal injuries, and damage of over \$3 million during the 43-year period.

As shown in table 2, Kansas reported 1,041 tornadoes, the greatest number in any State during the period 1916 through 1958. Texas had 999, Oklahoma 856, Iowa 599, Nebraska 450, Arkansas 448, and Missouri 446. These totals indicate that nearly one-third of the Nation's tornadoes have occurred in the three States—Kansas, Texas, and Oklahoma—and over one-half in seven States in the central and southern Great Plains. No tornado has ever been reported in Alaska†, although several waterspouts have been sighted near the coast. Official reports record only one tornado in Nevada* and one in Rhode Island* during these 43 years. Two have been reported in

Hawaii, four in the District of Columbia, eight in Oregon, and eight in Utah.

LOSS OF LIFE.--During the 43-year period 1916-58, tornadoes have caused the loss of 9,241 lives in the United States. Arkansas suffered the greatest loss, with 984 persons killed in the 43 years. Illinois was second with 943 deaths, 606 of which resulted from the single tornado of March 18, 1925. Mississippi ranked third with a death toll of 869, followed by Texas with 844. Although tornadoes occurred, no deaths were reported in Arizona, California, Connecticut, Delaware, the District of Columbia, Nevada, Oregon, Rhode Island, Utah, Vermont, Washington, or Hawaii.

Eight tornadoes were responsible for 100 or more deaths each during the 1916-58 period. The greatest killer of all, the tri-State tornado which swept from Missouri across Illinois and into Indiana, March 18, 1925, was blamed for 689 deaths. Two hundred and sixteen persons were killed at Tupelo, Miss., April 5, 1936; on the next day, April 6, 1936, 203 at Gainesville, Ga.; on April 9, 1947, 169 deaths occurred along a path from White Deer, Tex., across Oklahoma, to Nashville, Kans.; on June 8, 1953, 116 died in the Flint to Lakeport, Mich., storm; on May 11, 1953, 114 at Waco, Tex.; on May 26, 1917, 101 in the Mattoon-Charleston, Ill., tornado; and on June 23, 1944, 100 lives were lost as a tornado moved across five counties in West Virginia.

PROPERTY DAMAGE.--Property losses are shown in table 2 in thousands of dollars. The estimated losses presented are based on values at the time of occurrence; consequently, due to the change in the price index, comparisons of dollar losses can not

† A small tornado was reported November 4, 1959, on Kayak Island, Alaska.

* Records indicate the occurrence of two tornadoes in each of these States prior to 1916. In Nevada, one occurred at Winnemucca on December 16, 1879, and the other at Fallon on April 29, 1915 [9]. Redfield [10] lists tornadoes as occurring on August 15, 1787, in New Jersey, Connecticut, Massachusetts, and Rhode Island. Finley [11] reports one as occurring on August 30, 1838, at Providence, R. I.

accurately be made without adjustment. As this has not been done in this publication, no attempt has been made to present the total amount of property damage in each State for the period. The greatest damage, however, appears to have occurred in Texas, Oklahoma, Georgia, Illinois, and Missouri in that order. Negligible damage was reported in Nevada, and losses were mostly light in Arizona, Idaho, Oregon, Rhode Island, Utah, Washington, and Hawaii.

FREQUENCY AND TIME OF OCCURRENCE.--The annual number of tornadoes reported has increased in recent years. The mean yearly number for the country as a whole for the period 1916 through 1958 is 213, occurring on an average of 79 days a year, a great increase over the 149 tornadoes on an average of 66 days for the 1916-50 period. The average yearly number for the 6-year period, 1953-58, is 590 tornadoes on 154 days. The greatest yearly number (864) occurred in 1957. The next highest total of 592 was reported in 1955, followed by 565 in 1958, 550 in 1954, 532 in 1956, and 437 in 1953. Tornadoes have been reported during every month of the year. This is shown by tabulations in table 3, graphical presentation in figures 4 through 7, and charts 1 through 12. In this 43-year period of record, May was the month of greatest frequency, when 1,951 tornadoes occurred or an average of about 45 a year; June followed with 1,713, an average of 40 per year; April was next with 1,534, averaging nearly 36 a year.

Tornadoes are rare in fall and winter, with an average of about 5 to 8 a month in the United States from October through February. A marked increase begins in March and continues through the peak months of April, May, and June, with a decrease beginning in July and continuing progressively through fall and winter.

As will be noted by the charts showing the locations of tornado occurrences by months (charts 1 to 12), these storms follow a well-defined seasonal frequency. Tornadoes are most frequent in the Gulf Coastal States of Alabama, Mississippi, Louisiana, and southern Texas in winter, moving over a widening area including Arkansas, northern Texas, Oklahoma, Kansas, and Missouri during April and early May, the middle portion of the Great Plains by late May and June, the Dakotas and Minnesota by July. By August, they begin to decrease in northern areas, and at the same time begin to increase on

the coast of Florida and in other Atlantic coastal regions, where some are associated with the passage of hurricanes. About 66 percent of all tornadoes occurred during the March through June period, 22 percent from July through October, and only about 12 percent during the other months. These storms rarely occur in northern portions of this country in the winter. During 1957, however, an unusual outbreak of 21 tornadoes in December occurred in Illinois where these storms had been reported during that month in only four previous years.

The greatest number of tornadoes for a calendar date appears to have been on April 30, with an accumulated total of 124 for that date during the past 43 years. The next highest total for a calendar date was 107 on May 1, followed by 100 on May 20. On May 20, 1957, 37 tornadoes were reported for the greatest number occurring on a single day in any year, followed by 35 each on June 7, 1953 and on April 3, 1956. No tornadoes have yet occurred on February 2 and 23, November 30, and December 14 and 16.

While tornadoes may appear at any hour of the day or night, 82 percent of those for which the times of beginning are available have occurred between noon and midnight. They appear to form most readily in the hours closely following the warmest part of the day, generally from 3 to 7 p.m., during which time about 42 percent have occurred in the past 43 years. The greatest hourly number was recorded between 4 and 5 p.m., and 5 and 6 p.m., with 931 or 11 percent of all tornado occurrences for each hour; the next highest hourly frequency was between 3 and 4 p.m., when 857 or about 10 percent were reported; followed by the hour ending with 7 p.m., with 837 or slightly less than 10 percent. The least hourly number (only about 1 percent) were reported between 7 and 8 a.m. Although the peak occurrence is during the afternoon hours in all areas, an examination of the graphical presentation of the times of beginning of tornadoes accompanying this article shows a larger proportion of these storms occurring between midnight and noon in the Southern States than in the Great Plains. About 40 percent of the Alabama tornadoes and 36 percent of those in Louisiana on which the time was given occurred between midnight and noon, while in Kansas only 9 percent and in Nebraska 6 percent were reported during that time.

TORNADO FORECASTING

The need for tornado forecasts has been recognized for many years, but the meteorological techniques required to provide a minimum area of alert were not fully de-

veloped until the early 1950's. The techniques were improved in cooperation with the military services, and warning networks were established to help reduce tornado

casualties. There is now in operation the Severe Local Storms Forecasting Center in Kansas City devoting full attention to forecasting severe local storms for all vulnerable parts of the United States.

It is not possible to predict the exact spot where a tornado will strike, but when weather conditions indicate that they are likely to occur the tornado forecasts define a specific area, usually about 10,000 square miles, in which there is a reasonable possibility of occurrence. These forecasts are disseminated to the public by radio and television stations in and near threatened areas up to 6 hours in advance and

serve to alert the public to take any necessary preliminary action so that a place of safety can be reached quickly if a warning is issued that a tornado is approaching. Warnings are announcements that a tornado has been sighted. The warning is flashed to the public over all available communication channels, stating that a tornado has formed at a particular spot and describing the likely path it will take and time of arrival at different locations. Safe shelter can then be taken by all persons in the path. The forecast and warning service has been credited with saving many lives.

TORNADO ODDITIES

Because of the erratic behavior and intense forces demonstrated by tornadoes, many unbelievable and freakish occurrences have resulted during their passage. The furious winds of a tornado turn normally harmless objects into missiles of great penetrative power. Frequently, reports show that boards or even stalks of straw were driven into tree trunks, posts, and sides of buildings, huge trees were ripped from the earth and hurled hundreds of yards, persons were lifted into the air and carried for distances, and chickens were cleanly plucked of their feathers but unhurt. Other reports tell of fine dirt, stones, and bits of leaves being driven into the flesh of persons exposed to the wind, and clothes saturated with mud under similar conditions are said to be almost impossible to clean.

The terrific force and lifting power of the whirling tornadic winds are shown in the following descriptions. On April 16, 1879, a tornado at Walterboro, S. C., lifted a hickory tree, measuring 54 inches in circumference, out of the ground and moved it 10 feet up a bank; geraniums blooming in pots were found by the owner 1 mile away undamaged. At Marshall, Mo., an ice chest weighing 800 pounds was carried a distance of several miles on April 16, 1880. After the St. Louis, Mo., tornado of May 27, 1896, a 2x4-inch scantling was found protruding several feet through iron 5/8 inch thick on the Eads Bridge; wheat straws were found forced into a tree trunk to a depth of over 1 inch; and a 6x9-inch timber was driven 4 feet almost straight down into the hard ground. Following the tornado of November 10, 1915, at Great Bend, Kans., an iron water hydrant was discovered full of wooden splinters. The force of the wind at Fergus Falls, Minn., on June 22, 1919, split a huge tree, hurled an automobile into the split, and closed the opening in the tree, holding the automobile as if it were in a

vice. After the tri-State tornado of March 18, 1925, a large plank several feet long was found driven horizontally into a tree trunk so firmly that the far end could support a man's weight without loosening it from the tree; at Griffin, Ind., a piece of wallpaper about 2x3 inches was observed driven edgewise into the southwest side of a box elder tree about 6 feet above ground. At Nashville, Tenn., on March 14, 1933, a 2x4-inch timber was plunged through a panel door, without causing the slightest splitting or splintering and fit the opening perfectly; another plank, measuring 1x6 inches was forced through the trunk of a sturdy tree, splitting the tree in half. On July 4, 1956, at Edison, Nebr., 1x8-inch boards were driven into the ground in a straight line as if measured and placed there.

The powerful force of the rotating winds was shown in the tornado on May 27, 1931, at Moorhead, Minn., when farm implements of heavy iron and steel were twisted beyond recognition; at Nashville, Tenn., on March 14, 1933, when a high tension tower was bent to the ground in a tangled mass without breaking loose from its concrete moorings; and on April 6, 1936, at Gainesville, Ga., when a telephone pole was so twisted it resembled a huge corkscrew but still remained upright. On June 12, 1957, a tornado at a Dallas County, Texas, airport struck a steel hanger built to withstand winds up to 120 m.p.h., and pulled the concrete piers from the ground. During the tornado of June 22, 1919, at Fergus Falls, Minn., a trunk containing clothing was carried from one house and deposited in the attic of another two blocks away, and when found was undamaged. Galvanized roofing was carried 50 miles from La Plata, Md., on November 9, 1926. On May 7, 1927, a 5-ton caterpillar tractor was turned over and rolled 500 feet at Hutchinson, Kans.; a span of steel highway bridge near

Medicine Lodge, Kans., was blown downstream for 100 feet. At Gothenberg, Nebr., on June 24, 1930, two concrete blocks, weighing 2,000 pounds each, were torn from their fastenings and moved several feet. The courthouse bell, weighing nearly a ton, was carried 350 yards in the Gainesville, Ga., tornado on April 6, 1936, and portions of a huge sign which extended across a Gainesville mill were found at Easley, S. C., over 85 miles away.

Clothing and other small articles have been recovered many miles away from the scene of the storm. An unmailed letter and check which had evidently been blown from Great Bend, Kans., on November 10, 1915, were found 85 miles to the northeast. An insurance policy from a home in Marion County, Ala., was blown into Lauderdale County, a distance of 75 miles during the tornado of April 20, 1920. A picture postcard bearing an Orestes, Ind., address was recovered on April 17, 1922, at Mt. Cory, Ohio, 124 miles away, torn at one corner, but otherwise in good condition. After the tri-State tornado of March 18, 1925, a pair of trousers with \$95 in the pocket was picked up 39 miles away, and a check and calling card were carried 125 miles. An old postcard which had been kept in a trunk at Gainesville, Ga., was found, following the April 6, 1936, tornado, at Liberty, S. C., 80 miles distant. Pieces of stationery from Gainesville were picked up at Easley, S. C., over 85 miles away. A letter was carried 100 miles by a tornado in Pennsylvania on June 23, 1944. Various objects were reported to have been carried 90 miles from their original position at Corn, Okla., on June 8, 1951. A government bond from Kay County, Okla., was found at Williamsburg, Kans., over 100 miles away, following the April 2, 1956 storm. Another government bond and eight \$100 bills were found intact many miles away in an envelope bearing an El Dorado, Kans., address, following the tornado of June 10, 1958. On April 3, 1956, a package of knitting products from a wrecked Berlin, Wis., mill was recovered undisturbed 35 miles northward; a package of papers was found 75 miles to the north-northeast and a carton of deer hides was recovered 60 miles northeastward. Debris from the Hickman Mills, Mo., tornado of May 20, 1957, was found 180 miles distant. A jar of fruit was reported to have been carried a long distance from Wilkes Barre, Pa., on August 19, 1890, and when found was undamaged, except for the porcelain lining of the cover.

There are a number of instances on record of human beings and animals being whisked up from the ground and carried through the air for varying distances. A farmer was picked up, carried 150 yards, and put down without serious injury on

May 12, 1896, at Elkhorn, Nebr. During the tri-State tornado of March 18, 1925, 16 pupils were blown 150 yards into a field from a country school and none was killed. On April 9, 1947, as a man opened the door of his home near Higgins, Tex., the door was torn loose from his grip and he was picked up by the wind and carried for 200 feet over the tree tops. On November 4, 1950, in Pennsylvania a woman was carried 30 feet; on July 6, 1954, a Harding, Minn., farmer was lifted 40 feet and dropped to the ground unhurt; at Collinsville, Ill., on May 3, 1958, a man was carried 50 feet, and another was carried 100 feet at St. Martin, Minn., on June 4, 1958. Also during the tornado at El Dorado, Kans., on June 10, 1958, a woman was sucked through a window, blown 60 feet, and beside her was found a broken record entitled "Stormy Weather." An automobile with 2 passengers was carried 100 feet and dropped right side up without injury to the passengers on April 18, 1955, near Lanark, Ill.

Railroad trains have also been damaged and derailed by the wind force during the passage of these storms. On June 22, 1919, the Great Northern Limited was traveling at about 30 to 40 m.p.h., when the tornado at Fergus Falls, Minn., struck the baggage car behind the tender, throwing 7 of the 11 coaches from the rails. The baggage car was torn from the train and set down about 30 feet from the rails at right angles. The tornado of May 27, 1931, at Moorhead, Minn., crossed the Great Northern Railroad track, striking the "Empire Builder" at right angles. One 83-ton train coach with 117 passengers was lifted from the rails, carried through the air, and laid in a ditch 80 feet away, with only one death resulting when a passenger was hurled through the window and crushed beneath the coach. Other coaches were torn loose from the engine and pulled from the rails. On September 4, 1941, freight cars loaded with coal and weighing 80,000 pounds each were overturned near Minneapolis, Minn. At Gage, Okla., a train of 82 cars was struck by a tornado on June 21, 1958; 17 of the cars were derailed and 180 feet of track torn out.

Freakish and awesome stories are frequently reported in connection with the passage of tornadoes. In the town of Peggs, Okla., only one building was left undamaged by the tornado of May 2, 1920. It was the wooden, one-story jail, and not 30 feet away a concrete building was left in utter ruin. On July 2, 1924, 8 inches of snow, which seemed to come from a funnel cloud, covered an area of 20 square feet near Wabash, Ind. Small fish, crayfish, and tiny frogs fell during a shower of rain in a tornado associated with the passage of a hurricane in Alabama on June 28, 1957.

On November 10, 1915, during the Great Bend, Kans., tornado, a dresser was splintered, but its mirror was carried some distance and set down unbroken against a fence. At Fergus Falls, Minn., on June 22, 1919, a buffet was moved 2 feet from the wall without breaking a dish, although all other furniture was in splinters and the house so badly damaged, it was unsafe to enter. A similar story is told of the February 1950 tornado which scattered the roof and parts of a Shreveport, La., home over a half-mile area, but left the floor intact on which was a china closet filled with dishes, none broken. An incident of the Gainesville, Ga., storm of April 6, 1936, was told of three small boys who rushed under the front steps of their home in terror as the storm's roar approached. The house and all foundations were blown away, leaving only the front steps and the little boys frightened but unharmed. An awesome story is told about a boy who was found with a dozen splintered sticks protruding from his chest after the El Dorado, Kans., tornado of June 10, 1958.

There have been incidences of several tornadoes striking the same area within a short space of time, namely; at Austin, Tex., on May 4, 1922, two at a 30-minute interval, and at Baldwin, Miss., on March 16, 1942, two 25 minutes apart. In Ellis County, Okla., a destructive tornado occurred on April 9, 1947, and on May 31, another tornado passed over the same area. Due to the extensive destruction resulting from the first storm, further damage from the second was negligible as very little was left to destroy. The town of Codell, Kans., was struck in three successive years, 1916, 1917, and 1918, and each time on May 20 and at about the same hour of the day.

In some instances damage by tornadoes may result at treetop or housetop levels, indicating that the cloud did not completely reach the earth's surface. This char-

acteristic was very noticeable in two great tornadoes, one at Louisville, Ky., on March 27, 1890, and the other at St. Louis, Mo., on May 27, 1896. In the majority of cases damage was confined to upper floors, and most wrecked buildings owed their destruction to the collapsing of their walls from the weight of debris of ruined upper levels. At St. Louis, nearly all trees in Lafayette Park were broken and twisted off at an elevation of about 30 feet. Reports of more recent years show the concentration of damages above the ground level in the following tornadoes:

- April 16, 1954 - Ft. Valley, Ga. - \$2,000 damage at rooftop level.
- May 10, 1954 - East Hartland, Conn. - \$1,000 damage at treetop level.
- June 20, 1954 - Grand Island, Nebr. - \$3,000 damage to upper parts of higher buildings.
- July 19, 1954 - Kingsland, Ark. - \$1,000 damage to tops of houses.
- July 12, 1955 - Terrytown, Nebr. - damage (not estimated) to roofs and treetops.
- February 25, 1956 - Cedarville, Ohio - overhead at elevation sufficient to tear roofs from houses, damage \$250,000.
- July 21, 1956 - Collinsville, Okla. - slight damage as funnel reached to 100 feet of ground.
- April 22, 1957 - Kingfisher, Okla. - passed just above ground, damage \$100,000.
- May 12, 1957 - Carnegie, Okla. - slight damage as funnel reached to rooftop level.
- June 12, 1957 - Tuscola, Ill. - slight damage at treetop level.
- July 1, 1957 - Tulsa, Okla. - dipped to treetop level, damage \$20,000.
- August 14, 1957 - Hanson, Okla. - about 20 feet above ground, no estimate of damage.
- July 29, 1958 - Worcester to Shrewsbury, Mass. - slight damage at treetop level.

TORNADO OCCURRENCES IN MAJOR CITIES AND SELECTED COMMUNITIES

Records show that some of the larger cities in the country have been struck by two or more tornadoes as shown in the tabulation on page 38. Two of the St. Louis, Mo., tornadoes were among the most disastrous in history. On May 27, 1896, a tornado swept through St. Louis, causing a loss of 306 lives and property damage estimated at nearly \$13 million. Although not as disastrous as the 1896 tornado in regard to loss of life, St. Louis suffered even greater property damage in another such storm on September 29, 1927. Two tor-

nadoes at Gainesville, Ga., resulted in high death tolls; on April 6, 1936, 203 persons lost their lives and property losses were placed at \$13 million; a previous tornado, on June 1, 1903, caused 98 deaths and property damage of \$1 million. Losses of \$1 million or over have resulted from each of four tornadoes to strike Minneapolis, Minn. In March of 1948, two very destructive tornadoes swept through Oklahoma City, Okla., within 5 days, damaging aircraft to the amount of over \$16 million at Will Rogers and Tinker Fields.

OBSERVERS' IMPRESSIONS OF TORNADOES

Many observers state that the atmosphere becomes sultry and peculiarly oppressive just before the tornado cloud appears. Also, that it is calm, but suddenly a terrific wind seems to come from all directions at once as the funnel cloud dips down. Descriptions of tornado formation include statements to the effect that two cloud masses seem to meet, one moving from the south and the other from the west or northwest, the clouds breaking up in a wild turmoil, in some cases darting toward the earth, then shooting high into the sky; in the middle of the confusion, portions of the clouds roll about each other and a whirling cloud starts descending toward the earth.

The descending funnel cloud has been described as a thin, dangling rope; a fairly wide and solid-looking funnel balloon-shaped cloud; the tail of an enormous kite trailing to the ground; a grey revolving cloud, occasionally black and solid that began destruction as it touched the ground; a funnel rising from the earth and dipping down again a little farther on; a rotating cloud generally moving in a straight line, sometimes swinging from side to side, and occasionally changing form and shape and bouncing up and down. The noise accompanying the tornado is often referred to as a frightful roar, resembling a train passing through a tunnel.

Flora [12] describes a well developed tornado as the most amazing and terrifying atmospheric phenomenon ever seen. The tornado approaches with a peculiar whistling sound that rapidly changes to a terrifying roar and is described as a gigantic elephant trunk writhing about on a long rope dangling from the sky that spreads destruction wherever it touches the ground. Flora's report on the tornado at Hardtner, Kans., on June 2, 1929, states that the sky was partly overcast and the sun shone full on the pendant cloud, a striking sight for 30 miles across almost level country. Instead of moving at excessive speed, it seems to loiter and remain almost stationary for nearly 1/2 hour. The funnel was described as a big, grey elephant trunk or sausage balloon strung across the town with the upper end in the clouds and the lower part switching about in a cloud of dust on the ground. It was accompanied by a heavy fall of hail. At Kiowa, 10 miles eastward, where the sun could still be seen shining over the top of the cloud, slugs of ice, disk-shaped and over 2-1/2 inches wide and almost 1 inch thick, fell in the sunlight like gleaming meteors out of the black cloud that backed in from the east. Finally the parent cloud of the

tornado merged with the black hail cloud and the whole mass moved off toward the northeast.

Shipman [13], in reporting on the tornado at Fort Smith, Ark., stated that the general weather conditions on the morning of April 12, 1927, were sluggish and locally warm and sultry. At about 4 p.m., tornado signs appeared, with heavy rains west of Fort Smith. Clouds moved in opposite parallel paths, one from the north, and one from the south. A vortex apparently formed without a funnel. Under the vortex, debris rose, appearing like cinders or light trash ascending to the clouds. Open sky was noted to the north, east, and south near the horizon, but the horizon was obscured to the west. The formation of a small, but energetic, tornado whirl was seen in a break in the clouds near the horizon. The converging and turmoil of the clouds were observed with movement east-southeastward. Heavy rain and light hail lasted about a minute, then the skies began to clear on the western horizon and darken on the eastern. The first actual destruction occurred at Fort Smith at 4:04 p.m., with debris shooting upward under the vortex in a cloud of dust. The ascending wreckage had the appearance of a great explosion and was distributed in horizontal strata until drawn into the vortex. These ascending formations appeared three times without a tornado cloud being observed and each successive formation seemed stronger and to produce more destructive effects than the previous one. The fourth ascending formation was met by a descending cloud appearing like a cornucopia which failed to reach the ground, but was accompanied by more dust and wreckage. The fifth formation with the second funnel appeared as two large bells connected with a thin, ropelike pendant, followed in a few seconds by the sixth formation and third funnel which widened, accompanied by rain and a cloud of debris, and moved slowly to the northeast and disappeared. Towering cumulus and cumulonimbus clouds in the direction in which the tornado disappeared presented an imposing sight.

Mr. Will Keller, a farmer of near Greensburg, Kans., stood in the doorway of his storm cellar on the afternoon of June 22, 1928, and watched one of three tornado funnels rise above the ground and pass over his head. His description of what he saw was recounted by Justice [14]. The following paragraph conveys some of the pertinent information contained in this report:

As the great shaggy end of the funnel

hung directly overhead, everything was as still as death. There was a strong gassy odor and breathing became difficult. A screaming, hissing sound came directly from the end of the funnel. Mr. Keller looked up and saw right into the heart of the tornado where there was a circular opening in the center of the funnel, about 50 to 100 feet in diameter, and extending straight upward for a distance of at least 1/2 mile. The walls of this opening were rotating clouds and the whole was made brilliantly visible by constant flashes of lightning which zigzagged from side to side. Around the lower rim of the great vortex, small tornadoes were constantly forming and breaking away. These looked like tails as they writhed their way around the end of the funnel. It was these that made the hissing sound. The direction of

the rotation of the great whirl was anti-clockwise, but the small twisters rotated both ways, some one way and some another. The opening was entirely hollow, except for something which he could not make out, but supposed that it was a detached wind cloud. This thing in the center was moving up and down. The tornado was not traveling at a great speed. Its course was not in a straight line, but zigzagged across the country in a general northeasterly direction. Mr. Keller writes that he is not the first to lay claim to having seen the inside of a tornado. In 1915, a tornado passed near Mullinville, Kans., where a hired man on a farm over which the tornado passed looked up into the tornado and described it as being hollow and lit up by lightning.

TORNADO GROUPS OR FAMILIES

Tornadoes frequently occur simultaneously or within the space of a few hours in the same State or section of the country because weather conditions favorable for their development cover a large area. They are designated as a "family" or series of tornadoes. These tornadoes travel in the same direction, following parallel

paths that are rather close together, and sometimes a number of tornadoes break out many miles beyond the place where others ended.

A tabulation listing a few of these "families" of tornadoes which have occurred during the past 43 years is presented on page 40.

WATERSPOUTS

A waterspout is defined as a small, whirling storm over oceans or inland waters, with its chief characteristic a funnel extending in a fully developed spout. These whirling storms over water closely resemble tornadoes in many phases of outward appearance, and, like tornadoes, usually rotate in a counterclockwise whirl. Waterspouts may be divided into two classes, the tornado type and the convective type. In the tornado spout, the vortex is formed in the clouds and develops downward, while the other type originates at the water surface in convectively unstable air and builds upward, frequently under fair skies. Waterspouts occur mainly along or near squall lines, quite frequently in connection with thunderstorms and over quiet and heated waters, they may move very slowly, but frequently appear to be traveling across the water at great speed and can cause considerable damage to shipping [15].

Because of the absence of dust, the funnel of a waterspout is usually not as well defined as that of a tornado. In the tornado type, the funnel-shaped cloud dips toward the water, the water may appear to boil and turn white, rising to

meet the funnel. Most authorities say that the funnel of a waterspout is composed of condensed water vapor and is not, as is popularly thought, a column of water, except near the water surface. The height of a waterspout may vary from less than 100 feet to several thousand feet and the diameter from a few feet to several hundred feet. Some spouts assume fantastic shapes and even seem to coil about themselves, while others gradually narrow with descent until they are little more than points at the surface. Sometimes only one waterspout forms, but frequently they appear in groups, the number ranging to 15 or more.

Waterspouts may occur at any time of the year, but the maximum frequency is reported to be from May to October. In a study of the 11-year period, 1948 through 1958, we find that 237 waterspouts were reported near the coasts and over inland lakes of this country, with 48 in June, the maximum month of occurrence, followed by July with 46, August 42, and September 40. The area of maximum activity during the 11-year period was off the coast of Florida, where 120 were reported. Twenty-three were observed off Florida's west coast, 37 from

the Texas coast, and 13 in the Louisiana-Mississippi-Alabama area, making a total of 73 in the Gulf of Mexico. Twenty-four were reported off the Florida Keys, 65 in the south Atlantic area, only 6 off the middle and north Atlantic coasts, and 12 in the Chesapeake Bay. Twenty-four of the total number occurred over inland lakes of this country and 16 others in the Great Lakes region. The remaining 17 were reported in the Pacific Ocean, 14 near the California coast, 2 from Alaska, and 1 from Hawaii.

Funnel clouds often leave the water and touch land or move from land to water. During the 1948-58 period, 54 of these storms moved from the water to the land surface and were termed tornadoes. On reaching land they often dissipated, but sometimes they gained new rotational energy

and became dangerous tornadoes. They have even been known to reverse themselves several times from waterspouts to tornadoes. For instance, on September 5, 1935, a tornado near Norfolk, Va. [16], began by destroying trees and sheds on a point of land. The twister then crossed a creek, sending up the water so that the creek bottom was plainly visible and gouged out the exposed mud, carried anchored small boats onto the shore, ripped off part of a heavy pier, and destroyed some buildings. It became a waterspout in Hampton Roads, but changed back to a tornado and dumped a railroad gondola car and some refrigerator cars off the tracks in a railroad yard; then sucked up another creek, damaged some airplane hangars; and finally headed up Chesapeake Bay as a waterspout.

TORNADOES IN OTHER COUNTRIES

Tornadoes are typically American, although they do occur in other parts of the world. According to Dr. Wegener [17], 192 tornadoes were reported in Europe during the 100-year period, 1814 to 1913, slightly less than 2 per year. They are rare in Scotland, Norway, Sweden, Russia, and Hungary. Available publications report the occurrence of only 5 in Hungary in the 39 years, 1886 to 1925. In Holland, usually 2 or 3 of these storms are noted each year, but they are reported as small and usually not destructive. However, on June 21, 1950, an exceptionally large and dangerous one swept over Dinteloord and Willemstad. Several other tornadoes were reported in Holland on August 21 in 1950 [18]. About 50 destructive tornadoes were known to have occurred in the 82 years between 1868 and 1950 in the British Isles, mostly in the broad English lowlands or river basins, where they are reported as being most common in October, with the next greatest number during the first two weeks in June. In Europe, more than one-half of the tornadoes traveled from west or southwest, and about one-fourth from northwesterly direction.

Other principal tornado regions of the world, except the United States, are Canada, Africa, China, central Asia, Australia, and New Zealand. In New Zealand, the frequency of these storms is possibly 25 or more a year [19]. South Africa has had some tornadoes of great intensity. Several tornadoes are usually reported each year from India [20], and the Island of Ceylon and Suva in the Fiji Islands [21] have been visited by these twisters. In the tropics, this type of storm is generally rare, with only a few instances being on record.

The diurnal frequency in England shows the expected afternoon and early evening maximum. Paths in the British Isles vary in length from a few hundred yards to over 100 miles, the longer paths being of an intermittent or skipping nature. The historic Devon storm of October 21, 1638, although recorded to have been very severe, may not have been more so than the Welsh tornado of October 27, 1913, or the Buckinghamshire tornado of May 21, 1950 [22]. The latter, reported as one of the worst in 82 years, caused heavy damage in the town of Linslade and moved for a distance of 65 miles, one of the longest paths recorded in the British Isles or on the continent of Europe [23]. The West London tornado on December 8, 1954, caused damage comparable with that at Linslade as it traveled at about 40 m.p.h., leaving destruction over a path about 7 miles long and 100 to 400 yards wide [24]. A tornado at Chartres-de-Bretagne, in central France, was reported to have damaged buildings, trees, and gravestones on March 22, 1955 [25]. In Germany, great damage was done in forests near West Harz on May 4, 1952, as a tornado moved north-northeastward at the rate of 22 m.p.h., over a track in two stretches of 8 and 10 miles with a gap between of 11 miles [26]. Also in Germany on June 26, 1951, tornadic damage occurred near Potsdam [27]. A tornado, a rare phenomenon in Hungary, struck Tata on May 7, 1954, causing damage over a path 3 to 4 miles long and about 110 yards wide [28]. In the Khimki district of Moscow, USSR [29], a very violent storm termed a tornado struck on August 17, 1951, and on August 25, 1956, another such storm was reported near Moscow [30].

On the afternoon of August 11, 1923, a

tornado struck Peitaiho Beach, the principal summer resort of the foreign community north of Shantung, China, seriously damaging all buildings in its path [31]. Bermuda was visited by four of these storms, which moved from north to south, on Easter Sunday, April 5, 1953 [32]. One of these passed over Hamilton, causing 1 death, many injuries, and considerable property damage. Also in Bermuda, many buildings were damaged, tiles ripped from roofs, small sheds capsized, and fences blown down in an early morning tornado on December 12, 1925 [33]. A tornado, classed as a weather freak because it occurred in January, was reported in Nova Scotia, at White Point Beach, on January 30, 1954 [34].

Tornadoes are not uncommon on the Canadian prairies and in northwestern Ontario. Most are of brief duration, causing little damage, but some destructive ones have been reported. A greater percentage of the Canadian tornadoes, move from the northwest, and they generally occur later in the year and later in the day than those in the United States [35]. A study of the past 30 years shows the occurrence of 55 of these storms, mostly in Manitoba and Saskatchewan during the May to September period, with the peak activity in July. On June 30, 1912, a violent tornado inflicted damage in the millions and killed many per-

sons at Regina, Saskatchewan. Another struck at Kamsack, Saskatchewan in 1944, causing property losses estimated at \$2 million. In 1955, the town of Vita, Manitoba was leveled by a tornado. A small twister skipped along a 7-mile path southwest of Amaranth, Manitoba on July 5, 1957. Although three farmsteads were struck, the damage was slight due to the sparse settlement of the area. At the time the tornado cloud was small and quite isolated in the sky, a vicious storm deposited 3 inches of hail in the village of Amaranth, 5 miles to the northeast [36]. These storms occasionally cross the United States-Canadian border. One on June 27, 1936, that moved from Hill County northeastward across Blaine County, Montana, apparently passed into Canada. On June 17, 1946, a Michigan tornado began at Melvindale, moved to River Rouge, and crossed to Ojibway, Ontario, Canada, causing \$1 million damage and 35 injuries in the United States and \$500,000 damage, 15 deaths, and 39 injuries in Canada. In St. Clair County, Michigan, the tornado of May 21, 1953, struck the southern edge of Port Huron, crossed to Ontario and moved from Sarnia to Stratford. Another twister originated in Windsor, Ontario, on June 27, 1946, and traveled over a circuitous path to Detroit, Mich.

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Table 1.--SOME OUTSTANDING TORNADES, 1876-1958

Year	Month & day	Location	Time of occurrence	Deaths	Injured	Damage † (thous.)
1876	May 6	Chicago, Ill.	5:10 p.m.	-	-	\$250
1877	June 4	Mt. Carmel, Ill.	4:30 p.m.	16	100	400
	July 7	Pensaukee, Wis.	Afternoon	8	Many	300
1878	June 1	Richmond, Mo.	4:05 p.m.	-	-	100
	Aug. 9	Wallingford, Conn.	5:45 p.m.	30	70	250
	Oct. 8	Monticello, Iowa	5:30 p.m.	-	-	100
1879	Apr. 14	Collinsville, Ill.	2:35 p.m.	1	7	50
	Apr. 16	Walterboro, S. C.	3:45 p.m.	11	-	200
	May 29, 30	Kans., Mo., Nebr., Iowa	Afternoon-evening	30	50	No estimate
	June 10	Delphos, Kans.	Evening	2	14	100
1880	Apr. 18	Marshfield, Mo.	5:00 p.m.	65	200	110
	Apr. 18	Licking, Mo.	8:15 p.m.	1	17	50
	Apr. 18	Fayetteville, Ark.	8:30 p.m.	2	25	100
	Apr. 25	Macon, Miss.	8:30 p.m.	22	72	100
1881	Apr. 12	Hernando, Miss.	2:00 p.m.	10	-	50
	July 15	New Ulm, Minn.	4:45 p.m.	6	53	400
	Sept. 24	Quincy, Ill.	5:00 p.m.	-	-	100
1882	Apr. 5	Stafford, Kans.	4:00 p.m.	1	Several	100
	Apr. 18	Brownsville, Mo.	4:20 p.m.	11	150	180
	May 8	Mt. Ida, Ark.	5:30 p.m.	2	Several	150
	June 17	Grinnell, Iowa	8:45 p.m.	130	300	1,000
1883	Apr. 22	Copiah County, Miss.	1:10 p.m.	42	100	470
	May 13	Kansas City, Mo.	4:30 p.m.	-	-	300
	May 18	Racine, Wis.	7:00 p.m.	25	100	200
	May 18	Orongo, Mo.	7:40 p.m.	6	33	75
	Aug. 21	Rochester, Minn.	6:36 p.m.	31	-	200
	Nov. 5	Springfield, Mo.	2:00 p.m.	Several	-	Considerable
1884	Feb. 19	Bird's Point, Mo.	-	-	-	80
	Feb. 19	Ala., Ga., N. C., S. C.	Afternoon	420	1,000	3,000
	Apr. 1	Oakville, Ind.	5:00 p.m.	4	50	75
	Apr. 27	Jamestown, Ohio	4:00-5:00 p.m.	6	-	200
	July 21	Dell Rapids, S. Dak.	3:05 p.m.	-	-	100
	Aug. 28	Huron, S. Dak.	3:00 p.m.	6	-	Considerable
	Sept. 9	White Bear Lake, Minn.-Clear Lake, Wis.	5:00 p.m.	6	75	4,000
	Sept. 28	Shongo, N. Y.	6:20 p.m.	2	20	80
1885	Aug. 3	Camden, N. J.	3:20 p.m.	6	100	500
	Sept. 8	Washington Courthouse, Ohio	8:00 p.m.	6	100	500
1886	Apr. 14	St. Cloud & Sauk Rapids, Minn.	4:00 p.m.	74	136	500
	May 12	Attica, Ind.	8:15 p.m.	-	12	200
1887	Apr. 15	St. Clairsville & Martin's Ferry, Ohio	3:20 p.m.	-	-	250
	Apr. 21	Prescott, Kans.	5:30 p.m.	20	237	1,000
	Apr. 22	Mt. Carmel, Ill.	6:00 p.m.	2	Several	50
	Apr. 22	Clarksville, Ark.	6:30 a.m.	20	75	150
	June 16	Grand Forks, N. Dak.	3:22 p.m.	4	-	150
1888	Feb. 19	Mt. Vernon, Ill.	4:30 p.m.	18	54	400
1889	Jan. 9	Reading, Pa.	5:40 p.m.	40	-	78
	Jan. 9	Brooklyn, N. Y.	7:40 p.m.	-	-	500
1890	Mar. 27	Louisville, Ky.	7:57 p.m.	78	-	4,000
	May 10	Akron, Ohio	5:24 p.m.	-	-	No estimate
	July 26	Lawrence, Mass.	9:10 a.m.	8	-	No estimate
1891	May 20	Centralia & Mexico, Mo.	3:00 p.m.	4	35	71
1892	May 27	Harper, Kans.	7:40 p.m.	4	-	371
1893	Apr. 25	Cleveland County, Okla.	5:30 p.m.	30	Many	25
	Apr. 28	Cisco, Eastland County, Tex.	10:00 p.m.	23	-	400

Table 1.--SOME OUTSTANDING TORNADOES, 1876-1958 (Continued)

Year	Month & day	Location	Time of occurrence	Deaths	Injured	Damage † (thous.)
1894	Oct. 2	Little Rock, Ark.	7:20 p.m.	4	26	\$509
1895	July 13	Cherry Hill, N. J.	3:45 p.m.	4	50	93
	July 5	Baxter Springs, Kans.	Afternoon	5	10	120
1896	May 12, 15	Denton & Grayson, Tex.	Afternoon	76	-	231
	May 27	St. Louis, Mo.	-	306	-	12,904
1897	Mar. 30	Chandler, Okla.	5:30 p.m.	14	40	100
1898	May 18	Iowa, Wis., Ill.	3:20 p.m.	47	Many	700
1899	June 12	New Richmond, Wis.	-	Many	-	No estimate
1900	Nov. 20	Ark., Miss., Tenn.	Afternoon-evening	73	Many	500
1901	Aug. 24	Bayonne, Jersey City, & Hoboken, N. J.	Afternoon	-	-	150
1902	Mar. 28	Calhoun County, Miss. & Franklin County, Ala.	1:30-3:45 p.m.	2	-	Considerable
1903	June 1	Gainesville, Ga.	12:45 p.m.	98	190	1,000
1904	Aug. 20	Minneapolis-St. Paul, Minn.	8:00 p.m.	14	-	1,500
1905	May 10	Snyder, Okla.	6:45-8:45 p.m.	87	49	20
1906	Mar. 2	Meridian, Miss.	6:30 p.m.	23	-	400
1907	Apr. 5	Alexandria, La.,-southern Mississippi	1:00 a.m.	20	-	200
1908	Apr. 24	Lamar-Wayne Cos., Miss.	3:00 p.m.	100	649	880
1909	Mar. 8	Dallas-Monroe Cos., Ark.	5:00-7:10 p.m.	64	671	635
1910	May 29, 30	Charleston, W. Va.	Night	1	-	100
1911	Apr. 12	Brown, Waubaunsee, Douglas, & Cherokee Cos., Kans.	Evening	5	61	855
1912	Apr. 21	Illinois (Series of tornadoes)	4:30-6:00 p.m.	18	-	1,000
1913	Mar. 23	Omaha, Nebr.	5:49 p.m.	95	-	3,500
	Mar. 23	Terre Haute, Ind.	9:45 p.m.	21	-	1,000
1914	Aug. 21	Wilkes-Barre, Pa.	-	7	50	Considerable
1915	June 17	Pottawatomie, Coffey, Bourbon Counties, Kans.	4:00-9:00 p.m.	5	8	98
1916	Apr. 19	Southeast Kansas-Vernon Co., Mo.	3:00-5:00 p.m.	12	168	1,235
	June 5	Arkansas (series of tornadoes)	1:00 p.m.	83	400	Considerable
1917	Mar. 23	New Albany, Ind.	3:08 p.m.	45	-	2,000
	May 26	Mattoon-Charleston, Ill.	12:00 noon	101	638	2,500
	May 26	Lake County, Tenn.-Fulton, Hickman, Carlisle, & Graves Counties, Ky.	4:00-9:00 p.m.	70	-	2,000
1918	Aug. 21	Tyler, Minn.	9:20 p.m.	36	-	1,000
1919	June 22	Fergus Falls, Minn.	4:45 p.m.	59	-	3,500
1920	Mar. 28	Chicago, Ill., & vicinity	12:05 p.m.	28	-	3,000
	Mar. 28	Alabama-Georgia	2:30-4:00 p.m.	50	-	1,400
	Apr. 20	Oktibbeha County, Miss.- Franklin County, Ala.	9:00 a.m.	87	-	1,500
	May 2	Rogers, Mayes, & Cherokee, Okla.	6:00-8:35 p.m.	64	-	175
1921	Apr. 15	Cass County, Tex.-Miller, Hempstead, Pike Counties, Ark.	4:00 p.m.	61	-	1,300

Table 1.--SOME OUTSTANDING TORNADOES, 1876-1958 (Continued)

Year	Month & day	Location	Time of occurrence	Deaths	Injured	Damage † (thous.)
1922	Apr. 17	Illinois, Indiana, & Ohio	3:30-8:00 p.m.	16	53	\$ 900
	May 4	Austin, Tex.	4:00 p.m.	12	50	500
1923	Apr. 4	Alexandria-Pineville, La.	6:00 p.m.	14	-	750
1924	Apr. 30	Georgia-South Carolina	6:00-8:00 a.m.	10	-	2,202
	Apr. 30	Central South Carolina	7:30 a.m.	67	-	1,000
	June 28	Lorain-Sandusky, Ohio	4:35 p.m.	85	-	12,000
1925	Mar. 18	Missouri, Illinois, Indiana	1:00-4:00 p.m.	689	1,980	16,500
1926	Nov. 9	La Plata & Cedarville, Md.	2:35-3:15 p.m.	17	-	100
	Nov. 25	Belleville to Portland, Ark.	4:30-9:30 p.m.	53	-	627
1927	Apr. 12	Rock Springs, Tex.	7:45 p.m.	74	-	1,230
	May 9	Randolph County, Ark.-Poplar Bluff, Mo.	2:05 p.m.	92	-	2,287
	Sept. 29	St. Louis, Mo.	1:00 p.m.	72	-	22,000
1928	June 16	Jackson County, Okla.	6:15 p.m.	4	52	1,500
	Sept. 14	Rockford, Ill.	3:22 p.m.	14	-	1,200
1929	Apr. 5	Minnesota-Wisconsin	5:30 p.m.	6	-	1,010
	Apr. 25	Southeast to Central Georgia	4:00 p.m.	40	-	850
1930	May 6	Hill & Ellis Counties, Tex.	3:30 p.m.	41	-	2,100
	June 13	Minnesota-Wisconsin	5:00 p.m.	6	-	1,100
1931	Jan. 5	Caswell & Warren Counties, N.C.	4:00 p.m.	6	Several	45
	Dec. 12, 13	Columbia & Ouachita Counties, Ark.	11:45 p.m.-12:30 a.m.	1	-	1,250
1932	Mar. 21	Alabama (series of tornadoes)	3:15-7:00 p.m.	268	1,874	5,000
1933	Mar. 14	Nashville, Tenn.	7:30 p.m.	15	Many	2,200
	May 1	Webster-Bienville Parishes, La.	4:00 p.m.	23	400	1,250
1934	Oct. 23	Maryville, Mo.	5:15 p.m.	5	12	900
1935	Mar. 25	Massac County, Ill.	3:40 p.m.	1	34	300
	Apr. 6	Wilkinson-Amite Counties, Miss.	7:30 p.m.	11	75	190
1936	Apr. 2	Cordele, Ga.	7:30 p.m.	23	500	3,000
	Apr. 5	Tupelo, Miss.	8:55 p.m.	216	700	3,500
	Apr. 6	Gainesville, Ga.	8:27 a.m.	203	934	13,000
1937	Feb. 20	South-central Missouri	4:00-5:00 p.m.	-	13	190
	Mar. 25	Fayette & Clark Counties, Ky.	6:00 p.m.	5	23	150
1938	Sept. 29	Charleston, S. C.	6:45 a.m.	32	150	2,000
	Apr. 16	Drew County, Ark.	3:10 p.m.	27	62	20
1939	June 18	Hennepin & Anoka Counties, Minn.	3:10 p.m.	9	222	1,200
	Feb. 10	Dougherty County, Ga.	4:20 a.m.	18	397	3,200
1941	June 9	Lamb, Swisher, Donley Counties, Tex.	4:00 a.m.	4	33	510
	Oct. 26	Dardenelle to Hamburg, Ark.	11:15 p.m.	19	95	200
1942	Mar. 16	Central to northeast Mississippi	4:00 p.m.	75	525	1,400
	Apr. 27	Rogers & Mayes Counties, Okla.	3:45 p.m.	52	181	2,000
1943	Apr. 27	Akron-Cleveland, Ohio	7:30 p.m.	3	214	3,500
1944	June 23	Ravenna, Ohio-Pennsylvania-West Virginia to Cumberland, Md.	6:00-9:30 p.m.	150	867	4,200
1945	Apr. 12	Oklahoma-Arkansas	3:25-6:00 p.m.	102	689	4,000
1946	Jan. 4	Northeast Texas	2:10-9:00 p.m.	30	335	2,700
1947	Apr. 9	Texas, Oklahoma & Kansas	6:00-10:00 p.m.	169	983	9,800

Table 1.--SOME OUTSTANDING TORNADOES, 1876-1958 (Continued)

Year	Month & Day	Location	Time of occurrence	Deaths	Injured	Damage † (thous.)
1948	Mar. 19	Bunker Hill & Gillespie, Ill.	6:38-7:35 a.m.	33	449	\$3,800
	Mar. 20 & 25	Will Rogers & Tinker Fields, Okla.	10:00 & 6:00 p.m.	-	9	16,000
	Mar. 26	Terre Haute to Redkey, Ind.	5:00 p.m.	20	200	3,000
1949	Jan. 3	Louisiana & Arkansas	3:00-6:00 p.m.	58	439	1,500
	May 15	Amarillo, Tex.	6:30 p.m.	6	83	4,800
	May 21	Cape Girardeau, Mo.	6:55-7:00 p.m.	23	130	3,500
1950	July 19	Van Wert & Allen Counties, Ohio	Afternoon	-	30	2,000
1951	June 26,27	Gove & Trego Counties, Kans.	11:10 p.m.-12:30 a.m.	5	100	2,100
	July 20	Hennepin County, Minn.	9:00-9:30 p.m.	5	Many	6,000
1952	Feb. 29	Fayetteville, Tenn.	4:30 p.m.	2	150	3,000
	Mar. 21,22	Arkansas, Missouri, Tennessee (series of tornadoes)	3:00-12:00 p.m.	208	1,154	14,000
1953	Apr. 18	Columbus, Ga.	6:15 p.m.	2	300	15,000
	Apr. 30	Warner Robbins, Ga.	5:15 p.m.	18	300	15,000
	May 11	Waco, Tex.	4:10 p.m.	114	597	41,000
	June 8	Flint to Lakeport, Mich.	8:30-10:30 p.m.	116	867	19,000
	June 8	Northern Ohio	7:00-9:30 p.m.	17	400	20,000
	June 9	Central & eastern Massachusetts	3:25-5:00 p.m.	90	1,288	52,000
	Dec. 5	Vicksburg, Miss.	5:35 p.m.	38	270	25,000
1954	Mar. 13	Taylor, Crawford, & Bibb Counties, Ga.	10:00-11:35 p.m.	5	75	3,000
	Mar. 13	Ft. Mitchell, Ala.-Ft. Benning, Ga.	8:40-9:45 p.m.	2	20	6,000
	June 1	Cottle County, Tex.	7:30 p.m.	1	14	2,600
1955	May 25	Blackwell, Okla.	9:30 p.m.	20	280	8,000
	May 25	Udall, Kans.	10:30 p.m.	80	270	2,200
1956	Apr. 3	Southern Michigan	6:30-7:41 p.m.	18	340	11,000
	Apr. 15	Birmingham, Ala.	3:00 p.m.	25	200	1,500
1957	Apr. 2	Dallas, Tex.	4:30-5:10 p.m.	10	200	4,000
	Apr. 8	South-central North Carolina- North-central South Carolina	5:30-9:00 p.m.	4	130	2,100
	May 15	Silverton, Tex.	10:35 p.m.	21	80	500
	May 20	Williamsburg, Kans., to Ruskin Heights, Mo.	6:15-8:30 p.m.	44	531	Millions
	May 21	Des Loge to Cantwell, Mo.	3:45-4:15 p.m.	8	50	7,000
	June 14	Springfield area, Ill.	2:00 p.m.	2	50	3,000
	June 20	Fargo, N. Dak., to Moorhead, Minn.	6:40 p.m.	10	103	13,000
	Nov. 7	Groves, Jefferson Co., Tex.	9:15 p.m.	2	59	2,200
	Dec. 18	Jackson, Williamson, & Franklin Counties, Ill.	4:45 p.m.	11	200	2,000
1958	June 4	Woodville & Colfax, Wis.	5:30 p.m.	19	110	17,000
	June 10	El Dorado, Kans.	5:44 p.m.	15	50	3,000

† Damages are rough estimates made at the time of occurrence. Comparisons are impractical due to change in monetary values, metropolitan development, and population expansion.

Sources: Report of the Chief, Meteorological Yearbook, Monthly Weather Review, and Weather Bureau Stations.

Table 2.--NUMBER OF TORNADES, DAYS, DEATHS, AND DAMAGE FOR STATES AND UNITED STATES BY YEARS 1916-58

States	1916				1917				1918				1919				1920			
	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)
Ala.	4	4	1	✓\$4	4	2	40	✓\$430	3	2	13	✓\$100	2	2	5	\$201	5	3	108	✓\$2,155
Ariz.	1	1		(2)																
Ark.	32	4	101	✓\$10	8	7	28	178	7	5	1	148	3	3	6	98	2	2	18	✓\$100
Calif.																				
Colo.	1	1		30													2	1		(3)
Conn.																				
Del.																				
D. C.																				
Fla.					2	2	1	✓\$7					3	3		✓\$31				
Ga.																	1	1	33	1,250
Idaho	1	1		(3)																
Ill.	2	2	2	✓\$10	4	3	106	3,342	5	3	6	✓\$687					7	4	28	✓\$3,190
Ind.	2	2		(3)	9	4	75	✓\$3,200									3	1	39	✓\$1,350
Iowa	6	4		✓\$110	2	2		8	11	6	29	✓\$2,450	13	8		✓\$157	7	5		198
Kans.	8	3	3	✓\$235	17	7	42	✓\$1,870	6	4	10	✓\$810	5	4	5	✓\$229	5	4		✓\$201
Ky.	1	1		30	4	4	75	✓\$2,000									1	1		(3)
La.	1	1	2	40									3	2	4	✓\$45	1	1		(3)
Md.																				
Maine																				
Mass.																				
Mich.	2	2		(3)	3	2	4	✓\$1,000	3	3		✓\$20	1	1	59		6	2	12	✓\$2,000
Minn.	2	2		50					2	2	36	✓\$1,000	2	2	36	3,500	3	2	2	(3)
Miss.	9	7	18	✓\$313	5	4	1	31	1	1	1	✓\$20	2	2		1,050	5	2	135	1,500
Mo.	2	1	9	1,000	30	7	84	✓\$1,550	7	5	13	✓\$308	5	2		52	4	3	13	316
Mont.																				
Nebr.	4	3		✓\$20	2	2		(3)	4	4	3	✓\$300	5	2	1	✓\$250	4	3		(3)
Nev.																				
N. H.																				
N. J.																				
N. Mex.																				
N. Y.												✓\$5	1	1		(2)	1	1		(3)
N. C.	1	1		20	1	1		15	1	1		✓\$40	1	1		2	2	2	3	280
N. Dak.					2	2		(3)	2	2		✓\$5					4	3	1	✓\$53
Ohio	1	1	1	✓\$100	4	2	4	✓\$275	2	2		(3)					7	4	31	1,512
Okla.	4	2	9	✓\$35	17	6	21	✓\$425	3	3	3	✓\$20	7	4	24	✓\$535	5	3	64	385
Oreg.																				
Pa.					3	3	1	(3)	2	2		175	3	3	2	✓\$30				
R. I.																				
S. C.					2	2		33	1	1	1	✓\$15	2	2		6	8	7		171
S. Dak.	2	2	4	206					11	8	1	✓\$100	1	1		(2)	2	2		(3)
Tenn.	1	1		8	6	3	26	✓\$395					1	1		8	4	4	2	✓\$33
Tex.	2	2		✓\$25	3	3		✓\$200	8	3	9	✓\$510	9	3	64	✓\$668	4	4	6	✓\$79
Utah	1	1		(2)																
Va.					1	1	1	50	1	1		2								
Vt.																				
Wash.	1	1		(3)																
W. Va.																				
Wis.	1	1		20					3	3	9	715	1	1		1	1	1	1	25
Wyo.									1	1		2					1	1		10
U. S.	*90	†36	150	✓\$2,266	*121	†38	509	✓\$15,009	*81	†45	135	✓\$7,432	*64	†35	206	✓\$6,863	*87	†50	498	✓\$15,008

Table 2.--NUMBER OF TORNADES, DAYS, DEATHS, AND DAMAGE FOR STATES AND UNITED STATES BY YEARS 1916-58 (Continued)

States	1921				1922				1923				1924				1925			
	Number	Days	Deaths	Damage † (thous.)	Number	Days	Deaths	Damage † (thous.)	Number	Days	Deaths	Damage † (thous.)	Number	Days	Deaths	Damage † (thous.)	Number	Days	Deaths	Damage † (thous.)
Ala.	7	3	10	\$756	8	5	3	√\$140	1	1	1	\$12	13	5	40	√\$288	5	3	19	\$295
Ariz.																				
Ark.	12	7	73	√1,503	9	6	14	√75	3	2		52	4	4	5	√150	5	4		43
Calif.	1	1		17													1	1		50
Colo.	1	1		(3)	2	1	5	130	2	1		(3)	1	1	10	6	1	1		100
Conn.																				
Del.																				
D. C.									1	1		(2)								
Fla.	1	1		15																270
Ga.	3	3	30	√250									11	3	17	614		2	2	5
Idaho																				
Ill.	3	3		√3	2	2	7	295	1	1		10	3	3		87	4	4	606	13,303
Ind.	2	2		√50	4	2	17	466					2	2		√33	7	6	74	√3,003
Iowa	10	5	4	√684	9	8	1	747	7	6	6	√95	6	5	1	√99	18	8	6	√2,150
Kans.	6	5		√5	6	6		√5	18	12	1	√272	16	9	2	√2,142	12	8		√367
Ky.	2	2		50					1	1		(3)					8	3	21	1,360
La.	2	2	8	160	1	1	3	50	5	5	25	965	3	2	2	√100	3	3	5	√5
Md.									1	1		100								
Maine									1	1		200	1	1	2	750	1	1	1	200
Mass.																				
Mich.	3	3		√30	3	2		√31	2	2		√1					4	4		√280
Minn.	2	2	2	√200	2	2		17					2	2	3	√500	3	3		138
Miss.	11	7	42	√85	9	5	7	√350	2	1	17	350	8	4	20	√1,010	1	1	2	250
Mo.	1	1		(2)	4	4	4	177	6	4		√104	9	6	10	√304	4	4	13	√571
Mont.					1	1		(3)	7	6	2	√4	5	4		√50				
Nebr.	6	4		(3)	5	4	1	√100	6	4	3	√32	5	5	1	(3)	7	4	3	√457
Nev.																				
N. H.					1	1		10												
N. J.	1	1		(3)																
N. Mex.	1	1		(3)	3	3		√7	2	2		12								
N. Y.					2	2		125	1	1		5	1	1		150	1	1		400
N. C.	2	2	3	60	2	2	1	31	1	1	1	100	3	2	5	225				
N. Dak.	2	2	1	70	2	2		(3)	5	5	8	(3)	2	1	6	√300	1	1		10
Ohio	3	3		425	4	4	4	√800	2	2		√75	5	3	91	√12,555	2	2		105
Okla.	1	1		75	9	6	25	1,285	8	7	1	√113	7	4	25	1,307	8	4	2	√90
Oreg.																				
Pa.					2	2	1	50	1	1		20	4	4	6	557	3	1		164
R. I.																				
S. C.	2	2	1	6	2	2	5	46	1	1		1	6	4	78	3,055	1	1		3
S. Dak.	2	2		(2)	2	1	1	175	2	2		(3)	1	1		(3)	3	2		30
Tenn.	9	5	6	√211	3	3		220	3	3	20	171	2	1	1	√25	6	4	29	168
Tex.	17	10	22	√737	14	11	28	959	8	7	23	√261	7	5	7	√118	6	6	3	√127
Utah																				
Va.	1	1		5	2	2		30	1	1		(3)	2	1	1	31				
Vt.																				
Wash.																				
W. Va.																				
Wis.	1	1		60	3	3	8	560				√14	7	3	43	1,618	1	1	3	20
Wyo.	1	1		(2)					7	5	1						1	1		67
U. S.	*105	† 55	202	√\$5,457	*108	† 64	135	√\$6,881	*102	† 59	109	√\$2,969	*130	† 57	376	√\$26,074	*119	† 65	794	√\$24,041

Table 2.--NUMBER OF TORNAOES, DAYS, DEATHS, AND DAMAGE FOR STATES AND UNITED STATES BY YEARS 1916-58 (Continued)

States	1926				1927				1928				1929				1930			
	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)
Ala.	1	1	4	\$25	1	1	1	(3)	3	2	8	\$65	3	1	5	\$61	3	3		\$20
Ariz.																				
Ark.	17	4	60	√715	23	8	115	\$1,944	5	5	5	√126	21	8	79	√1,225	5	4	19	289
Calif.	4	2		185																20
Colo.	1	1		5					5	5	5	√267					1	1	3	10
Conn.	1	1		8																
Del.																				
D. C.					2	2		301												
Fla.	2	2	1	√35	4	3		66	1	1	1	10	6	3	1	145				
Ga.									7	5	8	63	9	3	55	1,196				
Idaho																				
Ill.	1	1		200	18	7	36	√6,070	7	7	14	1,240	4	4	2	74	7	6		789
Ind.	3	3		√60	9	7	1	3,264	3	3		82	2	2	1	35	2	2		6
Iowa	6	5	2	√427	10	7	1	168	45	20	8	√1,970	28	13	3	232	40	18	3	445
Kans.	14	8		√161	21	12	19	√1,742	26	13	1	√277	20	12	1	√315	24	10	2	√1,288
Ky.									2	1		94	3	2	1	610				
La.	5	4	21	√215	6	3	32	√165	1	1	1	13	2	2	2	14	5	3	7	84
Md.	1	1	17	100	1	1		65	1	1	1	10	2	1	6	190				
Maine																				
Mass.					1	1	1	100												
Mich.	2	1	3	40	5	4		235	4	3		√81	2	1		75	14	7		1,794
Minn.					2	2		101	5	4	6	1,190	4	4	8	1,460	5	2	1	√235
Miss.	4	3	14	(3)	2	1	14	20	2	2		(3)	4	4	29	(3)	5	4	5	88
Mo.	3	2	5	268	15	9	176	24,927	8	3	1	279	11	6	4	√549	7	2	8	893
Mont.	1				1	1		6									2	2		(2)
Nebr.	4	3		√156	6	4		113	12	7	4	√1,826	5	4		√130	13	9	5	√661
Nev.																				
N. H.									1	1		50	1	1		200				
N. J.	1	1		50											1	55	1	1		35
N. Mex.	2	2		10	1	1		(2)					3	3		√60	1	1	3	150
N. Y.	1	1		200					1	1		1								
N. C.	1	1		25	1	1		75	2	2	3	100	4	2	1	90	1	1		2
N. Dak.	1	1		20					4	3		√25	6	5		√165				
Ohio	6	5	1	224	4	4		50	5	5	2	√1,156	4	2	2	33	3	3		161
Okla.	4	2	8	238	10	8	20	√548	8	7	7	√1,583	11	9	3	√512	19	7	35	√650
Oreg.	1	1		(2)																
Pa.	1	1		100	1	1		200	2	2		√500	3	3		65	2	2		28
R. I.																				
S. C.	4	4	1	√365	1	1		1	7	3	2	132	7	7	17	158	2	2		16
S. Dak.	6	6		√131	2	2		167	5	5	4	√386	1	1		5	1	1		(2)
Tenn.	2	2		5					9	5	6	315	1	1	2	√10	1	1		25
Tex.	11	8	4	√252	25	8	124	√2,783	19	10	5	√673	25	17	17	√702	20	12	80	2,436
Utah																				
Va.					1	1		325					5	1	22	475				
Vt.					1	2		20					1	1		(3)				
Wash.																				
W. Va.	1	1		10																
Wis.	2	2	3	85	1	1			8	4		363	6	4	12	1,247	12	6	8	2,164
Wyo.	5	5		11					2	2		362					2	2		3
U. S.	*111	† 57	144	√\$4,326	*163	† 62	540	√43,457	*203	† 79	92	√\$13,239	*197	† 74	274	√\$10,113	*192	† 72	179	√\$12,292

Table 2.--NUMBER OF TORNAOES, DAYS, DEATHS, AND DAMAGE FOR STATES AND UNITED STATES BY YEARS 1916-58 (Continued)

States	1931				1932				1933				1934				1935			
	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)
Ala.	6	3	5	\$27	23	8	287	\$5,141	11	5	26	1/648	4	2	5	\$117	5	4	3	\$37
Ariz.																				
Ark.	4	5	1	1,264	5	4		137	26	16	17	1/270	6	4	2	47	13	10	7	365
Calif.									2	1		1/2	1	1		2				
Colo.					4	4		1/53	1	1		(3)	2	2		1/8	1	1		1
Conn.																				
Del.																				
D. C.																				
Fla.	1	1		40	2	2	1	(3)	8	6		1/9	10	6	2	1/52	2	2		1/4
Ga.					15	6	46	309	3	3	2	1/77	3	1	2	1/500	6	3		1/67
Idaho																				
Ill.	1	1		50	4	2		28	1	1		(3)								
Ind.	3	3		107	5	3		387	4	4	6	1/80	3	1		19	2	2	1	320
Iowa	19	10	4	478	16	9		211	5	3		1/159	2	2		14	2	2		1/70
Kans.	11	9	2	1/73	19	15	7	1/594	22	5		1/432	13	8	1	1/449	6	5		1/169
									29	20	5	1/950	20	16	1	1/98	15	8		1/358
Ky.									2	1	36	245	2	1	6	350				
La.	5	4	2	1/15	2	2		1/1	15	8	46	1/2,133	6	3	2	181	7	5	9	1/110
Md.	1	1		(2)					1	1		(3)	4	3		1/8	2	2		205
Maine	1	1		10																
Mass.					2	2		8												(3)
Mich.					3	3		1/5	5	6		1,220								
Minn.	2	2	2	212	2	2		700					5	4	1	929	15	11	3	1/675
Miss.	3	3	5	1/52	8	5	5	1/25	25	9	58	1/780	6	3	14	1/35	13	8	17	1/769
Mo.	3	2		47	2	2		1/8	11	9	3	1/96	4	4	5	1/906	2	2		1/38
Mont.	2	1		3	1	1		5	5	4		1/52	3	3		53	1	1		10
Nebr.	1	1		65	4	3	2	1/16	5	4	8	192	7	5		78	14	9	8	280
Nev.																				
N. H.																				
N. J.	1	1		4					3	3		1/1,015								
N. Mex.	3	1	1	28	2	2		16	2	2		4								6
N. Y.	1	1		1	1	1		100								(3)	2	2	2	1/10
N. C.	3	2	6	50									1	1		(3)				
N. Dak.	2	2		30	1	1		1/5	3	2	4	1/100	1	1		(3)	2	2	5	(3)
Ohio	2	2		60	4	3		1/64	5	5	1	1/1,204	1	1		1	1	1		5
Okla.	3	3	4	1/85	1	1		(2)	10	8	11	1/411	11	7	4	1/340	13	10	1	1/312
Oreg.																				
Pa.					2	2		1/10	1	1		750	1	1		8	1	1		5
R. I.													1	1		5				
S. C.	1	1		4	3	3	4	104	2	2	19	360	1	1		(2)	8	6		1/52
S. Dak.	2	2		31	6	4		1/278	11	9	1	1/347	10	7	1	1/5	2	2		1/25
Tenn.					9	3	38	510	13	5	87	1/3,143	2	2		13	4	2	3	109
Tex.	8	8	2	133	10	8	3	173	21	13	30	1/1,249	13	11	1	1/164	28	19	9	1/412
Utah																				
Va.	3	3	1	17																
Vt.																				
Wash.																				
W. Va.																				
Wis.	4	3	1	333	1	1		2	7	6	2	265	8	8		1/45	7	5		1/153
Wyo.									3	3		(3)								
U. S.	*94	† 57	36	1/3,219	*151	† 67	394	1/8,890	*258	† 96	362	1/616,193	*147	† 77	47	1/64,427	*180	† 77	70	1/64,663

Table 2.--NUMBER OF TORNADES, DAYS, DEATHS, AND DAMAGE FOR STATES AND UNITED STATES BY YEARS 1916-58 (Continued)

States	1936				1937				1938				1939				1940			
	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)
Ala.	10	5	20	1/2\$327	5	5	7	1/2\$50	6	3	12	\$205	10	6	4	\$147	5	4	7	1/2\$58
Ariz.					1	1		3												
Ark.	9	6	3	107	5	4	3	272	22	7	20	413	15	6	31	1/2295	2	2	6	14
Calif.	2	2		(3)																
Colo.					3	3		10	3	2		32					1	1		0
Conn.	1	1		(3)	2	2		50												
Del.									1	1		50								
D. C.																				
Fla.	4	4	7	45	6	6		49	4	4		1	8	8	4	1/32	6	3		1/2
Ga.	16	8	240	1/16,118	4	2		1/7	4	2	1	38	10	7	3	1/161	3	3	18	3,202
Idaho	1	1	2	4					1	1										
Ill.					1	1		88	16	6	24	2,002	4	4		175	1	1		25
Ind.	1	1		(2)	3	3		20	2	2		274	4	3		59	7	3	3	555
Iowa.	9	3	2	662	31	18	1	1/396	9	5		42	10	7		1/196	2	1	1	160
Kans.	13	8		1/139	15	7	1	92	31	11	17	885	16	12		1/57	10	7		1/134
Ky.					1	1	5	150	2	1		2								
La.	2	1	2	54	2	2	1	55	7	6	26	277	7	4	10	1/102	16	8	14	613
Md.					9	8		329	4	4		80	3	3	1	62	1	1		3
Maine					1	1		(3)												
Mass.	3	3		201					1	1		3					1	1		2
Mich.	1	1		10									9	2	2					
Minn.	5	3	3	1/891	6	6	1	213	12	5		546	3	3	10	1,892				
Miss.	5	2	224	1/3,080	3	2		23	8	5	1	64	5	5		1,251	6	4	1	255
Mo.	5	4	4	1/165	12	6	3	1/326	18	7	17	565	5	4		212	2	1	6	1/150
Mont.	4	4		4	1	1		2								56	1	1		0
Nebr.	3	3		37	5	2		49	8	5	3	61					9	6		89
Nev.																				
N. H.					1	1		1	1	1		6								
N. J.	1	1		(3)					1	1		2								
N. Mex.	3	3	1	11													1	1		0
N. Y.	3	3		(3)	1	1		20	1	1		1	1	1	1	20				
N. C.	4	2	14	1/2,073	2	2		50					2	2	1	53	3	3		(3)
N. Dak.	1	1		5	2	2	2	1/75	2	2		1/200	1	1		190	2	2	3	240
Ohio					3	2	3	1/115	2	2	2	(3)					1	1		(3)
Okla.	21	8	14	1/410	6	3	1	267	13	9		305	1	2	7	1/104	5	3		1/52
Oreg.					1	1		3												
Pa.					1	1		100	3	3		148	2	2		38	1	1		(3)
R. I.																				
S. C.	2	2	2	251	3	2		1/58	9	3	32	2,010	9	8	1	157	1	1		1/2
S. Dak.	4	4		1/23	5	4		103	8	6	3	146	3	3	1	21	4	4		1/58
Tenn.	4	2	11	217	1	1		6	1	1		25	3	3	5	45	2	2		188
Tex.	12	8	3	1/1,313	7	7	1	164	16	13	22	379	22	14	5	1/564	18	12	4	1/178
Utah																				
Va.	1	1		45	1	1		2	2	2	3	7	2	2	1	104	1	1		1/3
Vt.	1	1		2													1	1		3
Wash.	1	1		0																
W. Va.																				
Wis.	3	3		35	1	1		10	3	3		15					2	1	2	8
Wyo.									4	3		13					1	1		(3)
U. S.	*151	† 71	552	1/26,229	*147	† 75	29	1/3,158	*213	† 76	183	1/8,798	*152	† 75	87	1/5,893	*124	† 62	65	1/6,019

Table 2.--NUMBER OF TORNADES, DAYS, DEATHS, AND DAMAGE FOR STATES AND UNITED STATES BY YEARS 1916-58 (Continued)

States	1941				1942				1943				1944				1945			
	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)
Ala.					8	5	6	\$121	3	2	6	\$703	6	2	7	\$630	8	2	36	\$1,967
Ariz.																				
Ark.	3	2	19	\$210	7	2	33	2,265					16	2	40	641	3	3	27	535
Calif.	1	1		(3)									1	1		50				
Colo.	3	3		52	3	3	4	1/50												
Conn.					1	1		(3)												
Del.	2	2		155									1	1		(2)				
D. C.									1	1		0				1/10				
Fla.	5	5		16	1	1		(3)	1	1		(2)	6	3		1/10	6	6	1	80
Ga.	1	1		16	5	2	13	407	6	2	6	322	6	5	25	1,630	5	3	8	205
Idaho																				
Ill.	4	2		22	8	6	21	1,832	2	1		11	1	1	2	800	3	2	1	5,330
Ind.					6	3	6	1,209	4	4		812	3	3		15	6	6		1,332
Iowa	24	9	1	1/512	18	8	1	471	36	8		1/865	29	10	3	2,204	6	5		245
Kans.	19	12	8	596	18	11	22	1/767	13	5	1	1/970	23	17		480	13	12		278
Ky.					1	1	24	312												
La.	7	7	4	134	2	2	2	8	5	3	5	1/226	2	2	3	(3)	6	3	4	329
Md.	1	1		5	2	1		8	3	2		20	4	1	5	1,150				
Maine																				
Mass.	1	1		1	1	1		3												8
Mich.	1	1		100					6	3		1/620								
Minn.	6	5	6	698	6	5	2	1/262	8	6	1	1/428	1	1		250				1/6
Miss.					5	3	76	1/1,550	5	2	2	1/7					3	3	8	
Mo.	4	3	6	1/550	9	7	3	1/31	5	5	4	85	3	2		100	7	3	6	765
Mont.					1	1		(3)	1	1		2	1	1		(3)	1	1		0
Nebr.	4	3		33	7	4	6	213	2	2	2	34	4	3		177	3	2	7	306
Nev.																				
N. H.																				
N. J.	1	1	1	400																50
N. Mex.	3	3		3												25				
N. Y.																				
N. C.	1	1		4	1	1	1	45	1	1	6	128	3	3		298	1	1		5,000
N. Dak.																				
Ohio	1	1		4	2	2		(3)	13	5	6	1/4,695	3	2		80				
Okla.	8	5	1	216	15	11	114	2,580	7	7	4	63	22	9	3	770	18	10	104	4,550
Oreg.																				
Pa.	3	3		1/100					3	2		45	5	3	44	2,050	3	2		140
R. I.																				
S. C.					7	4	1	73					4	4	19	324	6	4	2	127
S. Dak.	1	1		(3)	4	4	2	6	4	3	1	22	1	1		200	1	1		(3)
Tenn.	1	1		(3)	10	4	28	1,075	3	3		7	9	6	7	1/4,819				
Tex.	12	10	6	586	11	7	16	1,720	17	9	14	1/2,133	4	4	4	1/1,132	18	12	5	680
Utah	1	1		4																
Va.	1	1	1	50	1	1		5					3	2	3	606				
Vt.																				
Wash.																				
W. Va.													3	1	103	2,000				
Wis.	4	4		27	9	6	1	259					5	4	7	1,189	4	4	1	138
Wyo.	1	1		(3)	1	1	2	(3)	3	3		1/2	5	4		15				
U. S.	*118	† 57	53	1/4,494	*167	† 66	384	1/15,272	*152	† 61	58	1/12,200	*169	† 68	275	1/21,645	*121	† 66	210	1/22,071

Table 2.--NUMBER OF TORNADES, DAYS, DEATHS, AND DAMAGE FOR STATES AND UNITED STATES BY YEARS 1916-58 (Continued)

States	1946				1947				1948				1949				1950			
	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)
Ala.	1	1		\$10	3	1	6	\$186	4	3	3	\$670	5	3	15	\$155	2	1		\$485
Ariz.					2	2		(2)												
Ark.	3	3	4	386	6	4	46	1,584	1	1		14	10	5	81	1,479	12	6	2	1/893
Calif.																1				
Colo.	2	2		40	3	3		810	2	1		(2)	2	2		225	1	1		150
Conn.					1	1		3					1	1		(2)	2	2		104
Del.													1	1		17				
D. C.																				
Fla.	6	5		40	24	13	2	1/638	13	9	2	1/409	11	11		1/77	6	6		69
Ga.	3	3		30	9	6		338	23	13	4	747	6	1	4	354	4	3		13
Idaho																				
Ill.	1	1	1	100	3	2		370	13	5	36	5,348	6	3	9	1,470	9	6	3	1/859
Ind.	4	4		323	5	4		366	10	7	22	4,360	6	4	17	1,566	3	2		130
Iowa	4	4		1,500	4	4	1	1/350	5	4	5	1,025	3	3		1/230	4	4		1/59
Kans.	11	7	1	1/323	16	12	1	1/653	15	10	2	1/2,076	37	17	2	1/1,032	30	19	1	1/894
Ky.	2	2		650					7	6	10	545	4	3	1	799	2	1		400
La.	8	6	2	1/40	9	7	24	2,202	3	3	1	460	8	7	3	461	20	8	29	1/1,154
Md.	1	1		(3)	2	2		(3)	3	3		1/95				(2)	1	1		4
Maine	1	1		1					1	1										
Mass.					2	2	1	100												
Mich.	5	4	1	1,760									1	1		10				
Minn.	6	4	11	1,497	4	4	4	1/848	1	1		1/50	1	1		15	1	1		5
Miss.	4	4	12	623	2	2		14	9	5	16	1/980	9	6	12	1,334	14	7	6	1/816
Mo.	7	4	2	1/1,135	16	10	22	1/1,240	11	7	4	1/1,107	21	14	34	1/5,603	9	9		1/551
Mont.	5	5	1	340	1	1		350	3	3	1	68	1	1		(2)				
Nebr.	1	1		(2)	8	2	2	180	4	3	1	1/411	11	8	4	1/874	7	6		1/677
Nev.													1	1		(2)				
N. H.	1	1	1	60																
N. J.																				
N. Mex.					1	1		0					2	1		0	2	2		36
N. Y.	1	1		2	1	1		5												
N. C.	1	1	4	108	1	1	1	250	1	1		44	6	3		1/261	8	5		1/121
N. Dak.	2	1		85	1	1	8	200					1	1		10	2	2		90
Ohio	1	1		40	8	8	3	1/515	9	4	4	1/700					3	2		1/2,020
Okla.	10	8	2	1/1,280	12	8	111	9,356	19	8	17	17,631	58	18	16	1/4,035	23	18	6	878
Oreg.																				
Pa.	1	1		(3)	7	5	7	1/1,200	3	3		1/110	7	3	1	1/144	5	4		1/315
R. I.																				
S. C.					1	1		5	2	2		112					1	1		25
S. Dak.									3	1		50	2	2		1/1,000				
Tenn.					5	3	5	1/15	4	4		1/15	6	4		1/513	3	2	9	9
Tex.	15	9	36	1/2,851	14	12	69	1/1,913	15	10	6	1/2,544	21	13	13	1/5,692	21	12	11	1/2,154
Utah																				
Va.					3	3		305	1	1		12	1	1		(3)				
Vt.																				
Wash.													1	1		1				
W. Va.									2	2	4	1/250	1	1		5				
Wis.	1	1		10					4	1	2	1/59	4	4		1/5	5	1	3	729
Wyo.									3	3		1/110	1	1		1	3	3		(3)
U. S.	*106 †	65	78	1/12,234	*165 †	78	313	1/23,996	*183 †	68	140	1/40,701	*249 †	80	212	1/27,369	*199 †	88	70	1/13,640

Table 2.--NUMBER OF TORNADOES, DAYS, DEATHS, AND DAMAGE FOR STATES AND UNITED STATES BY YEARS 1916-58 (Continued)

States	1951				1952				1953				1954				1955			
	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)
Ala.	5	3		\$88	11	7	6	\$758	24	12	16	\$5,549	9	5		\$408	6	4	5	\$168
Ariz.	2	2		0	1	1		(2)									2	1		1/8
Ark.	2	2		1/33	15	9	111	1/6,796	10	8		1/440	28	16	1	1/871	22	12	2	1/859
Calif.	2	1		1,550	3	2		1/100	1	1		7	1	1		10				
Colo.	5	5		145	4	4		1/73	16	8		1/44	13	10		1/11	19	14		1/290
Conn.	2	2		1/135									2	1		22	2	1		8
Del.													1	1		1/2	1	1		3
D. C.																				
Fla.	9	5	3	1/178	10	9		1/42	22	20		1/238	12	10	2	1/46	13	12		1/11
Ga.	3	2		27	12	6		1/1,402	12	4	22	1/30,723	26	10	9	1/10,108	16	9	1	1/669
Idaho																				(2)
Ill.	5	3	2	2,636	4	3		88	3	2	1	2,355	1	1		5	1	1		(2)
Ind.	4	4		1,302	2	2		1/355	6	4	2	1,021	7	7	1	671	25	10		1/1,230
Iowa	5	5	1	1/6,730	9	5	1	1/210	23	7	2	1/3,315	21	8	2	1/1,079	15	9		2,792
Kans.	91	38	7	1/2,676	16	15		1/330	30	17		1/216	68	33		1/382	82	22	81	1/3,064
Ky.	2	2	1	121	2	2		1/500					3	3		118	3	3		300
La.	10	8		1/1,043	9	7	4	1/1,315	20	12	13	1/3,155	11	8	2	1/189	3	3		1/30
Md.					4	2		1/20	2	2		1/4	2	3		(3)				
Maine									2	2		1/1	2	2	1	30				
Mass.	2	2		1/10					2	1	90	52,874	2	2		1/7	4	3		1/6
Mich.	8	6	1	1/477					14	8	127	1/23,313	13	8		1/607	12	9		203
Minn.	5	3	6	1/7,250	10	6		1/1,970	13	7	9	1/825	7	6		269	13	9	2	1/1,893
Miss.	8	6	3	1/142	7	4	9	386	22	14	39	1/26,909	15	10		1/1,279	6	5		1/445
Mo.	6	6		1/63	9	8	18	1/4,300	5	5		1/24	31	14	2	1/760	33	14		1/567
Mont.					2	1	1	1/426	7	4		1/60	4	4		1/76	3	1		27
Nebr.	9	8		1/20	9	8		1/96	47	21	16	1/3,058	17	15	7	1/670	32	16	3	1/654
Nev.																				
N. H.	1	1		1/4					2	1		100	1	1		25	1	1		4
N. J.	1	1		50	2	2		30									1	1		(2)
N. Mex.	2	2		(2)									8	5		1	1	1		2
N. Y.					1	1		10					1	1		20	1	1		35
N. C.	4	4		57	7	7		1/300	3	3		124	9	9		455	7	7	1	570
N. Dak.	1	1		(3)	9	7	2	505	11	5	2	1/166	2	2		10	12	9	2	1/390
Ohio	2	2		1/1,000	4	2		1/630	3	3	17	20,029	11	8	1	1/424	7	5	1	1,171
Okla.	41	24		1/889	20	15		1/488	57	25	5	1/1,160	55	22	2	1/2,595	82	35	23	1/9,124
Oreg.	1	1		(2)									1	1		0				
Pa.	7	6		1/1	8	5		1/1,676	10	9		1/70	23	15		1/47	2	2		1/50
R. I.					4	5	2	741	5	5	1	205	9	6		1/132	10	8	2	1/838
S. C.					5	4		1/58	13	10		1/189	11	8		1/186	14	5		1/88
S. Dak.	2	2		(3)																
Tenn.	1	1		(3)	22	4	74	9,857	11	5	4	1/498	2	2		60	13	9		1/1,463
Tex.	15	11	3	1/1,704	13	11		382	32	18	146	1/45,563	77	40	3	1/4,071	105	42	2	1/6,488
Utah					1	1			1	1		(2)	1	1		8	3	2		1/6
Va.	5	5		1/507	3	2		102	6	5		1/20	5	5		(3)	1	1		5
Vt.					1	1			1	1		1	1	1		0	2	2		10
Wash.	1	1		1/10									1	1		6				
W. Va.	1	1		4									2	2		1/300				
Wis.	5	4	7	1/637	1	1	2	250	3	2	4	1/2,030	12	8		1/406	9	5		1/411
Wyo.					1	1		(2)	8	8		1/63	2	2		1	4	3		1/5
Hawaii																	1	1		1
U. S.	*272	†113	34	1/29,489	*236	†98	230	1/35,196	*437	†136	516	1/224,349	*550	†160	35	1/28,369	*592	†152	125	1/33,979

Table 2.--NUMBER OF TORNAOES, DAYS, DEATHS, AND DAMAGE FOR STATES AND UNITED STATES
BY YEARS 1916-58 (Continued)

States	1956				1957				1958			
	Num-ber	days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)
Ala.	5	6	25	\$1,608	51	14	10	√\$4,529	21	10	1	\$ 1/768
Ariz.	3	2		(2)	5	5		1/14	4	4		6
Ark.	13	7	1	√254	27	12	3	√984	7	7		1/126
Calif.	2	2		35	1	1		(2)	10	7		1/39
Colo.	9	7		(3)	24	14		1/8	18	15		1/52
Conn.	1	1		(2)	1	1		350	3	3		1/86
Del.					2	2		1/5	1	1		(2)
D. C.												
Fla.	16	13		√1,310	19	14		1/71	25	16	1	√1,605
Ga.	17	16		√1,190	18	9	3	1/997	11	10		1/476
Idaho	5	5		1/1	1	1		0	1	1		9
Ill.	28	18	8	3,290	42	13	15	1/8,732	27	13	2	1/1,627
Ind.	34	12	1	4,568	27	12		426	25	12		732
Iowa	7	5		523	17	12		1/257	14	12		1/190
Kans.	63	33	3	√1,941	64	20	7	1/2,515	49	22	15	√3,176
Ky.	9	5	1	1/969	4	4		1/288	8	6		1/178
La.	10	9		1/295	30	16	14	1/1,957	9	5		1/165
Md.	4	1		(3)				1/3	2	2		1/50
Maine	3	3		26	2	2		1/3	7	5		93
Mass.	10	6		1,086	8	5		1/39	12	9	1	1/87
Mich.	24	11	24	18,016	15	8	1	1/580	7	7		1/17
Minn.	9	9		1/185	16	12		1/677	14	9	2	1/682
Miss.	7	5	1	√1,720	26	14	6	1/1,819	13	5	13	√1,203
Mo.	25	13		√547	36	15	55	1/11,415	29	17	2	1/652
Mont.					1	1		1	4	4		1/4
Nebr.	34	21		√1,002	53	25	1	1/2,416	54	26		1/608
Nev.												
N. H.	2	2		8	2	2		28				
N. J.	4	3		√40	1	1		100	3	2		110
N. Mex.	4	4		1	17	9	1	568	7	4		0
N. Y.	1	1		(3)	1	1		5	4	4		1/26
N. C.	10	4		95	8	4	4	1,711	4	4		1/58
N. Dak.	15	11		√444	13	8	10	1/10,087	9	9		119
Ohio	8	6	2	√1,129	4	3		1/1,050	9	8		1/386
Okla.	56	27	5	√3,224	106	27	22	√4,762	42	26		1/275
Oreg.					2	1		1/4				
Pa.	4	4		√1,170	9	7		197	1	1		5
R. I.												
S. C.	6	6		1/116	8	5		1,111	6	2	1	51
S. Dak.	11	9		1/182	20	15	1	1/162	1	1		5
Tenn.	8	5	3	√1,329	17	9		1/2,242	2	2	1	105
Tex.	57	32		√437	145	42	37	√12,400	74	43		1/3,967
Utah					1	1		6				
Va.	4	1		1/150	4	3		1/167	1	1		55
Vt.					2	2		61				
Wash.	1	1		0	2	2		1	2	2		20
W. Va.	1	1		250	1	1		200				
Wis.	6	4	9	1,391	12	6	1	1/434	17	10	27	1/10,183
Wyo.	2	2		5	3	3		1/10	13	8		53
Hawaii					1	1		1/10				
U. S.	*532	†155	83	√\$48,537	*864	†154	191	√\$73,399	*565	†166	66	1/28,049

√ Additional losses incurred.

√/ Damage negligible.

√/ No estimate of damage.

* Corrected for boundary-crossing tornadoes.

† Tornado days for country as a whole.

‡ Damages are rough estimates made at the time of occurrence. Comparisons are impractical due to change in monetary values, metropolitan development, and population expansion.

Table 2.--NUMBER OF TORNADES, DAYS, DEATHS, AND DAMAGE FOR STATES
AND UNITED STATES BY YEARS 1916-58 (Continued)

States	Totals for the Period 1916 - 1958			Averages for the Period 1916 - 1958		
	Number	Days	Deaths	Number	Days	Deaths
Alabama	320	164	776	7.44	3.81	18.05
Arizona	21	19	---	0.49	0.44	-----
Arkansas	448	238	984	10.42	5.54	22.88
California	35	27	---	0.81	0.63	-----
Colorado	156	120	27	3.63	2.79	0.63
Connecticut	20	18	---	0.46	0.42	-----
Delaware	10	10	---	0.23	0.23	-----
Dist. of Col.	4	4	---	0.09	0.09	-----
Florida	277	218	34	6.44	5.07	0.79
Georgia	278	151	550	6.47	3.51	12.79
Idaho	14	14	2	0.33	0.33	0.05
Illinois	301	172	943	7.00	4.00	21.93
Indiana	269	171	258	6.26	3.98	6.00
Iowa	599	315	89	13.93	7.33	2.07
Kansas	1041	553	270	24.21	12.86	6.28
Kentucky	76	57	181	1.77	1.33	4.21
Louisiana	279	189	334	6.49	4.40	7.77
Maryland	62	50	30	1.44	1.16	0.70
Maine	22	20	1	0.51	0.46	0.02
Massachusetts	56	44	96	1.30	1.02	2.23
Michigan	177	114	175	4.12	2.65	4.07
Minnesota	204	153	181	4.74	3.56	4.21
Mississippi	307	189	869	7.14	4.40	20.21
Missouri	446	256	536	10.37	5.95	12.46
Montana	70	60	5	1.63	1.40	0.12
Nebraska	450	275	91	10.46	6.40	2.12
Nevada	1	1	---	0.02	0.02	-----
New Hampshire	15	14	1	0.35	0.33	0.02
New Jersey	25	23	2	0.58	0.53	0.05
New Mexico	75	58	6	1.74	1.35	0.14
New York	32	32	5	0.74	0.74	0.12
North Carolina	113	91	55	2.63	2.12	1.28
North Dakota	129	103	54	3.00	2.40	1.26
Ohio	159	121	176	3.70	2.81	4.09
Oklahoma	856	429	724	19.91	9.98	16.84
Oregon	8	7	---	0.19	0.16	-----
Pennsylvania	140	112	62	3.26	2.60	1.44
Rhode Island	1	1	---	0.02	0.02	-----
South Carolina	154	121	191	3.58	2.81	4.44
South Dakota	189	148	20	4.40	3.44	0.46
Tennessee	204	119	366	4.74	2.77	8.51
Texas	999	560	844	23.23	13.02	19.63
Utah	8	7	---	0.19	0.16	-----
Virginia	70	53	35	1.63	1.23	0.81
Vermont	11	12	---	0.26	0.28	-----
Washington	11	11	---	0.26	0.26	-----
West Virginia	13	11	110	0.30	0.26	2.56
Wisconsin	187	130	155	4.35	3.02	3.60
Wyoming	78	68	3	1.81	1.58	0.07
Alaska	---	---	---	---	---	-----
Hawaii	2	2	---	0.05	0.05	-----
United States	*9,167	†3,412	9,241	*213.19	†79.35	214.91

* Corrected for boundary-crossing tornadoes.

† Tornado days for country as a whole.

NOTE: The losses presented in this publication are based on values estimated at the time of occurrences; consequently, due to the change in the price index, comparisons of damages can not accurately be made without adjustment. This has not been done in this publication.

Table 3.--NUMBER OF TORNADOES, DAYS, DEATHS, AND DAMAGE FOR UNITED STATES
BY MONTHS FOR YEARS, 1916-58

Year	January				February				March			
	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)
1916	3	2	-	11	-	-	-	-	1	1	-	25
1917	2	2	-	5	-	-	-	-	15	7	80	2,612
1918	3	1	13	140	3	2	2	225	-	-	-	-
1919	-	-	-	-	-	-	-	-	16	5	54	1,680
1920	-	-	-	-	-	-	-	-	22	6	180	9,773
1921	-	-	-	-	4	3	28	(2)	15	9	13	888
1922	3	2	5	122	2	2	1	41	25	9	35	770
1923	2	2	2	50	-	-	-	-	8	3	37	577
1924	1	1	-	(1)	4	1	3	58	13	3	17	1,132
1925	4	2	-	33	6	3	1	111	10	3	740	18,047
1926	2	2	3	3	4	3	10	105	4	2	4	232
1927	-	-	-	-	6	4	45	185	9	3	37	554
1928	5	3	4	221	-	-	-	-	7	6	15	90
1929	6	2	12	715	5	1	25	191	20	7	21	427
1930	-	-	-	-	2	2	-	152	10	5	4	108
1931	3	1	7	48	-	-	-	-	5	3	4	115
1932	9	5	25	213	2	2	-	10	46	7	344	6,076
1933	13	6	4	1,152	4	1	-	37	56	7	124	4,581
1934	4	2	1	55	12	4	20	664	6	3	-	177
1935	-	-	-	-	8	2	1	267	29	14	11	1,083
1936	6	2	20	170	4	2	-	20	11	6	17	1,432
1937	-	-	-	-	13	6	-	416	5	4	8	210
1938	-	-	-	-	2	1	21	300	60	10	76	3,709
1939	7	5	6	115	16	9	4	419	13	7	5	285
1940	2	1	7	20	3	3	18	3,206	20	5	9	577
1941	2	2	-	2	-	-	-	-	1	1	-	(2)
1942	6	3	2	74	16	2	22	2,307	21	5	150	4,279
1943	6	2	6	322	1	1	-	(2)	11	5	1	820
1944	8	2	2	82	3	3	1	50	16	6	10	5,270
1945	-	-	-	-	9	3	42	1,977	31	13	3	1,457
1946	10	4	45	2,958	5	3	1	1,012	3	3	-	435
1947	16	4	17	1,133	-	-	-	-	2	2	2	115
1948	5	2	1	295	7	3	8	300	46	10	79	26,628
1949	8	2	61	1,847	6	5	-	78	31	10	35	3,293
1950	8	5	1	766	20	4	45	1,125	21	5	1	1,546
1951	3	2	-	1,725	10	4	1	170	6	6	-	151
1952	12	4	-	368	27	6	9	4,729	32	9	208	15,164
1953	14	6	-	335	17	3	3	1,122	40	10	24	3,920
1954	2	1	-	13	19	9	2	1,039	69	13	10	11,274
1955	2	2	-	(1)	4	3	-	223	41	15	4	4,935
1956	2	2	-	27	47	12	8	6,957	31	7	1	2,885
1957	17	3	13	2,541	5	3	-	6	39	7	1	590
1958	12	7	-	377	20	5	13	1,369	15	10	-	89
Total	*208	†94	257	15,938	*316	†120	334	28,871	*882	†272	2,364	138,011
Avg.	*4.8	†2.2	6.0	-	*7.3	†2.8	7.8	-	*20.5	†6.3	55.0	-

See footnotes at end of table.

Table 3.--NUMBER OF TORNADOES, DAYS, DEATHS, AND DAMAGE FOR UNITED STATES
BY MONTHS FOR YEARS, 1916-58 (Continued)

Year	April				May				June			
	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)
1916	8	2	13	1,249	15	6	9	140	41	9	105	451
1917	6	5	2	120	49	10	376	9,567	41	9	48	2,632
1918	18	8	17	902	34	15	58	4,992	8	6	7	73
1919	15	6	83	1,024	12	8	-	84	3	2	59	3,565
1920	18	11	243	4,187	13	6	65	475	13	11	2	154
1921	39	13	112	3,082	16	9	8	642	6	5	-	88
1922	22	11	48	2,180	17	14	16	1,313	9	5	12	898
1923	17	10	23	1,216	27	12	25	660	20	13	9	33
1924	28	6	124	4,455	18	6	57	1,429	24	15	110	14,521
1925	19	12	7	700	5	5	3	125	38	14	10	3,070
1926	13	6	4	320	13	8	4	517	17	5	2	718
1927	41	13	127	3,999	54	13	233	11,434	10	6	-	319
1928	24	9	5	704	21	11	4	917	71	20	16	5,138
1929	67	18	170	5,964	48	17	42	1,532	20	11	3	937
1930	4	4	-	26	89	15	127	7,645	33	17	8	2,734
1931	4	3	-	26	14	9	2	286	23	10	3	278
1932	11	5	13	160	14	8	3	77	30	16	-	237
1933	30	12	11	1,008	90	23	206	7,861	20	12	2	436
1934	10	6	-	52	17	9	8	340	32	15	3	1,309
1935	26	10	20	565	42	12	20	898	29	16	7	654
1936	31	7	492	23,298	25	13	10	245	27	11	10	422
1937	23	9	9	298	34	15	3	1,027	44	18	8	846
1938	34	10	17	410	49	17	17	670	22	10	14	756
1939	39	9	50	660	16	10	5	523	30	13	11	1,723
1940	27	8	23	1,185	10	7	-	182	18	9	2	66
1941	30	10	3	717	16	10	4	406	26	11	15	1,194
1942	19	8	87	3,840	30	12	37	1,745	33	14	46	1,275
1943	19	7	17	4,258	45	10	10	2,339	25	13	5	1,141
1944	52	12	93	5,301	28	9	8	1,401	35	13	161	8,787
1945	25	9	148	7,975	14	9	1	541	22	14	3	8,875
1946	4	3	-	22	33	14	15	3,006	18	12	2	2,213
1947	29	10	198	12,026	29	17	9	1,773	33	14	47	4,446
1948	28	7	15	3,061	25	9	18	4,850	25	13	2	2,694
1949	31	8	13	2,068	99	17	69	16,692	23	11	4	940
1950	16	7	12	1,420	59	22	2	1,602	27	12	6	2,425
1951	26	9	2	982	66	19	7	713	77	22	9	16,527
1952	37	12	4	3,826	36	16	2	1,987	35	17	3	3,766
1953	45	16	34	39,757	99	21	162	55,306	114	24	244	96,506
1954	117	22	3	3,800	97	22	8	4,125	101	26	5	4,010
1955	101	18	7	6,548	150	26	103	14,141	148	28	2	3,510
1956	87	15	67	24,133	88	24	4	7,424	66	21	-	1,363
1957	216	21	29	17,548	226	26	87	16,419	148	25	14	18,162
1958	78	19	4	5,458	69	21	-	2,191	128	27	42	14,191
Total	*1534	†426	2,349	200,530	*1951	†582	1,847	190,242	*1,713	†595	1,061	234,083
Avg.	*35.7	†9.9	54.6	-	*45.4	†13.5	43.0	-	*39.9	†13.8	24.7	-

See footnotes at end of table.

Table 3.--NUMBER OF TORNADOES, DAYS, DEATHS, AND DAMAGE FOR UNITED STATES
BY MONTHS FOR YEARS, 1916-58 (Continued)

Year	July				August				September			
	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)
1916	4	4	2	\$ 200	4	4	-	\$ 100	2	2	-	\$ (1)
1917	3	2	-	(1)	1	1	1	(1)	-	-	-	-
1918	1	1	-	(2)	6	5	36	1,000	4	4	-	5
1919	3	3	2	30	5	5	-	64	4	4	-	33
1920	12	8	3	319	2	2	-	5	5	4	1	15
1921	4	3	1	175	3	3	-	1	9	5	-	239
1922	9	6	1	677	7	7	-	50	4	4	-	15
1923	5	4	1	62	10	6	-	280	11	7	6	29
1924	14	9	4	2,876	9	7	20	474	10	5	37	984
1925	12	9	1	336	4	4	2	55	4	3	-	478
1926	14	12	6	172	11	8	2	364	9	6	1	474
1927	12	10	11	653	3	3	-	69	14	2	81	25,232
1928	25	12	1	485	23	9	18	2,232	13	2	22	2,625
1929	11	6	-	167	4	3	-	2	10	5	-	161
1930	11	9	-	63	4	4	-	81	17	9	5	708
1931	7	5	-	38	11	7	1	256	11	7	5	742
1932	22	12	8	1,904	4	4	-	9	7	4	-	84
1933	15	11	5	945	11	9	1	111	6	6	-	16
1934	24	13	-	186	9	8	-	38	10	4	-	134
1935	20	12	9	809	8	5	-	52	13	3	2	306
1936	21	12	2	405	9	8	-	72	9	7	-	56
1937	11	9	-	118	5	5	1	14	4	3	-	14
1938	15	10	3	746	15	9	-	134	7	3	32	2,030
1939	9	8	-	81	16	10	5	1,965	3	2	1	6
1940	11	8	-	127	13	9	3	182	4	2	2	39
1941	7	6	-	11	6	3	2	775	6	5	5	687
1942	9	6	-	742	6	4	-	68	5	5	-	25
1943	16	9	2	1,105	11	6	3	1,226	2	2	-	101
1944	11	10	-	327	6	5	-	44	4	4	-	198
1945	6	5	7	441	2	2	1	41	10	9	1	714
1946	8	8	1	152	8	6	11	937	7	5	-	678
1947	10	9	10	719	4	3	1	502	18	7	5	540
1948	21	13	3	207	2	2	-	625	6	3	2	434
1949	7	6	-	1,066	10	5	-	174	3	3	2	78
1950	23	14	-	2,914	12	11	-	305	3	3	-	85
1951	23	15	5	6,306	26	15	-	524	9	7	8	692
1952	30	14	3	1,366	15	11	1	1,779	1	1	-	20
1953	40	19	-	240	26	15	-	147	5	4	-	7
1954	46	23	-	642	46	21	1	773	20	10	3	270
1955	50	21	5	2,111	34	18	-	386	16	8	2	240
1956	101	26	1	1,640	43	20	2	1,721	19	10	-	266
1957	54	19	-	1,732	26	14	-	72	17	10	2	765
1958	119	30	1	1,085	45	20	1	756	24	14	1	232
Total	* 876	† 451	98	\$34,380	* 525	† 326	113	\$18,465	* 365	† 213	226	\$40,457
Avg.	* 20.4	† 10.5	2.3	-	* 12.2	† 7.6	2.4	-	* 8.5	† 5.0	5.3	-

See footnotes at end of table.

Table 3.--NUMBER OF TORNADES, DAYS, DEATHS, AND DAMAGE FOR UNITED STATES
BY MONTHS FOR YEARS, 1916-58 (Continued)

Year	October				November				December			
	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)	Num-ber	Days	Deaths	Damage † (thous.)
1916	1	1	-	\$ (2)	-	-	-	-	11	5	21	\$ 90
1917	4	2	2	73	-	-	-	-	-	-	-	-
1918	1	1	-	10	3	2	2	\$ 85	-	-	-	-
1919	5	1	7	333	-	-	-	-	1	1	1	50
1920	1	1	4	75	-	-	-	-	1	1	-	5
1921	1	1	-	17	3	2	11	20	5	2	29	305
1922	-	-	-	-	7	2	12	705	3	2	5	110
1923	-	-	-	-	2	2	6	62	-	-	-	-
1924	1	1	-	75	3	1	-	5	5	2	4	65
1925	8	5	26	758	4	3	-	20	5	2	4	308
1926	1	1	-	10	23	4	108	1,411	-	-	-	-
1927	9	4	5	115	4	3	-	897	1	1	1	(1)
1928	5	3	-	86	5	3	3	715	4	1	4	26
1929	2	2	1	9	-	-	-	-	4	2	-	8
1930	5	4	3	56	17	3	32	719	-	-	-	-
1931	4	4	-	81	4	3	-	17	8	5	14	1,332
1932	4	2	1	55	-	-	-	-	2	2	-	65
1933	5	4	3	8	1	1	-	2	7	4	6	36
1934	5	3	11	1,268	17	9	4	199	1	1	-	5
1935	2	1	-	5	3	2	-	24	-	-	-	-
1936	-	-	-	-	1	1	-	1	7	2	1	108
1937	7	5	-	195	1	1	-	20	-	-	-	-
1938	1	1	-	3	8	5	3	40	-	-	-	-
1939	3	2	-	116	-	-	-	-	-	-	-	-
1940	2	2	-	10	3	2	-	362	11	6	1	63
1941	23	8	24	685	-	-	-	-	1	1	-	17
1942	6	2	31	538	1	1	-	2	15	4	9	377
1943	3	2	-	59	13	4	14	829	-	-	-	-
1944	4	2	-	100	2	2	-	85	-	-	-	-
1945	1	1	1	50	-	-	-	-	1	1	3	(1)
1946	3	2	-	75	5	3	3	150	2	2	-	596
1947	5	5	-	106	12	4	4	830	7	3	20	1,806
1948	4	2	-	120	14	4	12	1,487	-	-	-	-
1949	16	7	2	451	5	3	15	214	10	3	11	468
1950	2	2	-	120	4	2	-	725	4	1	3	607
1951	3	3	-	15	12	5	1	629	11	6	1	1,055
1952	-	-	-	-	7	5	-	1,626	4	3	-	565
1953	6	4	-	48	11	6	-	364	20	8	49	26,597
1954	15	8	2	700	2	2	-	40	16	3	1	1,683
1955	23	7	1	344	20	4	1	1,451	3	2	-	90
1956	30	8	-	1,063	8	6	-	793	10	4	-	265
1957	17	11	2	322	61	11	25	9,798	38	4	18	5,444
1958	9	6	4	1,372	45	6	-	909	1	1	-	20
Total	*247	†131	130	\$9,526	*331	†117	256	\$25,236	*219	†85	206	\$42,166
Avg.	*5.7	†3.0	3.0	-	*7.7	†2.7	6.0	-	*5.1	†2.0	4.8	-

1/ No estimate 2/ Slight 3/ Considerable

* Corrected for border-crossing tornadoes.

† Tornado days for country as a whole.

‡ Damages are rough estimates made at the time of occurrence. Comparisons are impractical due to change in monetary values, metropolitan development, and population expansion.

Table 4. TOTAL NUMBER OF TORNADES AND TORNADO DAYS BY STATES AND U. S. TOTALS AND MEANS, 1916-58

	January		February		March		April		May		June		July		August		September		October		November		December		Total		
	Torna- does	Days	Torna- does																								
Ala.	31	16	40	22	72	39	60	32	31	17	18	4	2	2	3	2	3	3	8	6	30	9	22	12	320	164	
Ariz.					1	1	1	1	1	1	2	1	4	3	8	8	2	2		1	1	1	1	1	21	19	
Ark.	16	10	33	19	68	38	111	58	75	32	46	20	12	10	3	3	9	5	12	9	36	16	27	18	448	238	
Calif.	4	2	2	2	6	5	10	6	4	4	1	1	1	1	1	1	1	1	1	1	2	2	3	2	35	27	
Colo.			1	1	5	2	15	12	36	27	51	41	32	24	8	7	2	2	4	3	2	1			156	120	
Conn.									1	1	3	2	1	1	4	6	6	4	4	2	1					20	18
Del.									1	1	1	1	1	4	4	2	2	1	1	1					10	10	
D. C.									1	1	2	2	2								1				4	4	
Fla.	18	11	19	15	22	20	36	30	23	20	28	21	24	24	21	20	34	19	23	17	13	11	16	10	277	218	
Ga.	24	13	23	17	49	23	93	36	20	17	14	11	5	5	10	7	8	7	2	2	15	9	15	4	278	151	
Idaho							1	1	2	2	6	6	3	3	2	2									14	14	
Ill.	4	3	2	1	53	24	52	30	60	35	35	27	13	12	23	17	9	7	9	5	12	5	29	6	301	172	
Ind.	4	3	13	5	50	25	47	21	43	35	51	33	34	28	5	4	8	7	4	4	8	4	2	2	269	171	
Iowa			1	1	28	16	81	39	170	68	158	89	70	47	37	26	30	16	20	11	4	2			599	315	
Kans.	3	1	6	3	51	25	137	74	309	128	300	153	92	65	61	49	33	33	28	13	19	8	2	1	1041	553	
Ky.	6	4	1	1	15	11	12	9	11	10	4	4	9	6	1	1	1	1	4	2	6	4	6	4	76	57	
La.	11	10	25	16	40	25	47	30	44	26	12	10	12	11	8	7	4	4	14	11	41	22	21	17	279	189	
Maine					1	1			2	2	2	2	2	9	7	3	5	5	3	1	1	4	3			22	20
Md.			1	2	1	1	6	4	13	10	7	4	13	11	13	11	3	3	1	1	4	3			62	50	
Mass.									5	5	14	8	16	12	7	7	5	5	4	3	3	2	2	2	2	56	44
Mich.	1	1	1	1	6	2	16	11	46	23	52	34	17	13	20	13	14	13	2	1	2	2			177	114	
Minn.					2	2	8	6	37	25	74	55	46	37	26	18	7	6	2	2	2	2			204	153	
Miss.	13	12	41	19	79	41	55	33	32	19	14	10	8	8	4	5	4	3	4	30	16	23	19			307	189
Mo.	13	8	18	9	70	32	73	38	113	51	60	45	20	19	10	10	25	17	15	13	16	10	13	4	446	256	
Mont.			1	1			1	1	10	7	23	19	24	21	8	8	1	1							2	70	60
Nebr.					2	1	47	30	109	66	145	80	86	55	33	26	19	11	7	4	2	2			450	275	
Nev.							1	1																		1	1
N. H.									2	2	4	3	4	4	2	2	2	2	1	1					15	14	
N. J.					1	1	4	4	3	3	4	3	6	5	4	4	1	1	1	1	1	1			25	23	
N. Mex.					1	1	5	2	35	24	14	11	6	6	6	6	4	4	4	4					75	58	
N. Y.							1	1	5	5	8	8	7	7	5	5	4	4	1	1	1	1			32	32	
N. C.	4	3	4	4	18	11	25	17	17	15	11	11	8	7	14	11	3	3	3	3	5	5	1	1	113	91	
N. Dak.							1	1	17	13	43	32	46	39	16	14	6	4							129	103	
Ohio	5	5	4	2	21	12	18	12	31	25	33	27	16	12	16	13	12	10	1	1	2	2			159	121	
Okla.	16	9	22	14	56	26	213	89	265	114	146	77	47	34	22	18	23	18	16	15	26	12	4	3	856	429	
Oreg.			1	1			3	2			1	1								1	1	1	1	1	1	8	7
Pa.	1	1	1	1	4	4	18	12	21	15	31	24	28	24	13	13	14	10	1	1	8	7			140	112	
R. I.																										1	1
S. C.	2	2	7	6	19	15	37	28	29	24	20	19	3	3	13	8	13	7	3	3	3	3	5	3	154	121	
S. Dak.					1	1	19	7	30	21	71	58	36	31	22	20	9	9	1	1	1	1			189	148	
Tenn.	12	9	23	10	70	31	30	18	25	17	14	9	7	6	3	3	3	3	2	2	9	8	6	3	204	119	
Tex.	24	14	35	17	101	52	266	116	256	143	108	65	55	48	43	37	17	10	39	24	30	20	25	14	999	560	
Utah									2	2	4	3			2	2										8	7
Vt.			1	1	1	1					3	3	3	3	4	2	2			1	1					11	12
Va.	1	1	2	2	5	4	12	10	17	11	7	7	6	3	8	8			1	1	2	2			70	53	
Wash.							2	2	3	3	3	3														11	11
W. Va.					1	1			2	2	6	4	1	1	2	2	1	1	1	1	1	1		1	1	13	11
Wis.					3	3	30	16	27	20	53	37	36	26	12	10	20	14	6	4					187	130	
Wyo.							1	1	18	15	35	31	17	14	5	5										0	0
Alaska																										0	0
Hawaii	1	1			1	1																				2	2
*U.S. Total	208	94	316	120	882	272	1,534	426	1,951	582	1,713	595	876	451	525	326	365	213	247	131	331	117	219	85	9,167	3,412	
*U.S. Mean	4.8	2.2	7.3	2.8	20.5	6.3	35.7	9.9	45.4	13.5	39.9	13.8	20.4	10.5	12.2	7.6	8.5	5.0	5.7	3.0	7.7	2.7	5.1	2.0	213.2	79.3	
*U.S. Mean tornadoes per tor- nado day	2.2		2.6		3.2		3.6		3.4		2.9		2.0		1.6		1.7		1.9		2.8		2.6		2.7		

*Corrected for boundary-crossing tornadoes.

Table 5.--TOTAL NUMBER OF TORNADES BEGINNING DURING THE SPECIFIED HOURS, 1916-1958

	A.M.												P.M.										Total			
	12-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10		10-11	11-12	
Ala.	4	9	15	12	8	8	12	6	15	16	10	10	7	13	18	19	33	22	16	10	14	10	11	16	314	
Ariz.																									21	
Ark.	7	4	8	6	9	3	5	1	3	9	6	11	16	11	5	2	2	2	2	27	29	14	30	393		
Calif.	2		1			2			3	4	3	2		3	2	1		1				1		30		
Colo.	1	1	1			1		2		1	3	4	6	20	16	23	25	15	4	4	8	4	3	2	144	
Conn.								1		1			2	1	1	4	2	6			1				19	
Del.							1					1	1		2	1	2			1			1		10	
D. C.															2				1						3	
Fla.	6	6	6	4	9	6	5	5	9	10	6	5	16	20	26	28	14	11	14	11	7	8	6	3	241	
Ga.	1	4	7	8	4	5	4	11	12	10	7	5	6	18	14	24	27	17	16	15	18	13	12	6	264	
Idaho										1		1	1		1	5	2		1			1	1		14	
Ill.	4	5	10	2	1	2	1	1	1	2	2	6	10	9	24	43	38	43	29	19	9	11	11	13	294	
Ind.	6	9	12	10	1	6	2	2	1	3	2	1	6	9	22	25	19	34	24	20	11	12	7	9	253	
Iowa	6	6	8	6	5	5	5	3	2	6	3	6	10	15	32	56	71	80	63	64	24	38	23	24	561	
Kans.	16	13	9	5	6	2	2	4	3	4	12	12	19	37	62	81	122	141	135	99	63	70	42	31	990	
Ky.	2	1	2	1	4	1	1	2		4		1	1	1	6	5	9	6	8	6	5	2			68	
La.	4	8	7	12	6	4	11	6	9	10	7	12	10	19	22	17	14	18	17	8	9	9	12	13	264	
Maine													1	2	6	4	3	2	3						22	
Md.	1		1	1				1	1		1	4	1	1	5	7	5	7	5	4	7	3	1	4	60	
Mass.	1					1				1	1	2	2	1	9	9	7	4	6	3	2			2	51	
Mich.	3	1	1	1	1				1	5	3	3	4	8	9	14	21	22	20	14	11	6	7	1	156	
Minn.	1	3	1	1	4				2	1	1	3	6	8	13	30	24	24	25	21	19	9	4	2	199	
Miss.	5	14	8	7	1	5	3	7	7	4	11	9	15	7	18	14	16	14	24	21	17	7	9	14	257	
Mo.	8	11	10	11	8	3	3	3	1	3	3	10	10	22	26	33	48	49	30	29	28	19	15	23	406	
Mont.			2							1	1		1	1	7	8	17	5	5	2	3	2	1	2	58	
Nebr.	4	4	2	3	3		2		1	3	3		7	9	26	40	60	59	51	45	37	21	21	16	417	
Nev.													1	1											1	1
N. H.													1	2		3	4	3	1			1			14	
N. J.	1										1		2	1	4	4	3	4	2	2			1		25	
N. Mex.			1		2						2		6	5	11	10	12	4	9	4	2	1			69	
N. Y.												1	1	7	3	3	5	6	3	1	3			1	27	
N. C.		1	1	1	2	1				1		1	7	1	9	15	16	11	16	9	7	5	1	1	106	
N. Dak.		2			1	1		1	1		2			5	8	10	18	14	13	9	12	7	5	1	109	
Ohio	1	2	1	1	1	5	4		1	3	1	3	5	3	10	23	19	13	12	7	12	6	5	2	137	
Okla.	22	23	17	15	10	10	8	8	14	5	19	6	8	12	38	79	76	82	94	58	75	66	44	43	832	
Oreg.			3	1			2		1	1	1	1	2		2		1	1							8	
Pa.	1									2	2	4	5	7	10	16	15	14	8	16	7	4	5	4	127	
R. I.																									0	
S. C.		2	5	2	4	2	3	4	5		5	2		5	16	17	12	17	14	10	9	5	4	1	144	
S. Dak.	1	1	3	1	3	1				1		1	4	4	14	14	15	27	22	18	10	12	8	4	164	
Tenn.	2	7	7	4	7	1	3	1	1	9	2	5	5	6	9	12	14	28	12	19	10	7	13	13	197	
Tex.	22	20	26	16	18	20	22	19	19	16	20	20	26	43	59	90	90	85	89	56	52	39	22	26	915	
Utah													3	2				1							7	
Vt.										1		1				1	4	2	1						9	
Va.	2					1		1	1		3	2	6	4	6	7	9	7	8	5	2	2	3		69	
Wash.																										10
W. Va.						1						1		2		2		2	2			1			11	
Wis.	4	4	3	1	2	1	1	1		1	2		8	7	20	19	19	20	20	19	10	5	2	6	175	
Wyo.						1						3		6	6	12	17	4	6	3	4	1	1		65	
Alaska																									0	
Hawaii										1								1							2	
*U.S. Total	131	159	172	128	116	98	95	89	115	129	147	154	250	342	619	857	931	931	837	645	522	416	324	301	8,508	
*U.S. Percent	1.5	1.9	2.0	1.5	1.4	1.2	1.1	1.0	1.4	1.5	1.7	1.8	2.9	4.0	7.3	10.1	11.0	11.0	9.8	7.6	6.1	4.9	3.8	3.5	100.0	

* Corrected for boundary-crossing tornadoes.

This tabulation is based on the reported time of beginning of 8,508 tornadoes; the time of day is not available for the remaining 659 (7 percent) of the 9,167 tornadoes that occurred during the 43-year period. All entries based on local standard time.

Table 6.--TORNADOES ASSOCIATED WITH PASSAGE OF TROPICAL STORMS, 1916-58

Year	No. of tornadoes	Date	Location	Deaths	Injuries	Damage † (thous.)	Remarks
1916	2	July 6	Tallapoosa County, Ala.	0	0	No estimate	Hurricane June 29-July 10.
		Oct. 18	Montgomery, Ala.	0	0	Slight	Hurricane Oct. 12-19.
1919	2	Sept. 10	Goulds, Dade County, Fla.	0	6	25	Hurricane Sept. 2-15 centered over Gulf of Mexico.
		Sept. 15	Uvalde, Uvalde County, Tex.	0	0	No estimate	Hurricane Sept. 2-15.
1924	1	Sept. 16	North of Browntown, Wayne County, Ga.	1	0	5	Hurricane Sept. 13-19.
1928	8	Aug. 10	Batesburg, Lexington County, S.C.	2	0	6	Six tornadoes in South Carolina with hurricanes Aug. 3-12 and Aug. 7-17.
		Aug. 10	Newberry, Newberry County, S. C.	0	0	25	
		Aug. 15	Charleston, S. C.	0	0	Slight	
		Aug. 15	Little Mountain, Newberry County, S. C.	0	0	6	
		Aug. 15	Newberry County, S. C.	0	0	30	
		Aug. 15	Bath, Aiken County, S. C.	0	2	5	
		Aug. 11	Hookerton, Greene County, N. C.	1	0	50	Two tornadoes in North Carolina with hurricanes Aug. 3-12 and Aug. 7-17.
Aug. 16	Ashley Heights, Hoke County, N. C.	2	0	50			
1929	5	Sept. 28	Ft. Lauderdale, Broward County, Fla.	0	0	100	Five tornadoes in Florida in northeast sector of hurricane Sept. 22-Oct. 4.
		Sept. 28	Miami, Dade County, Fla.	0	0	20	
		Sept. 28	Stuart, Martin County, Fla.	0	0	No estimate	
		Sept. 29	Boca Raton, Palm Beach County, Fla.	0	0	No estimate	
		Oct. 1	Blackville, Barnwell County, Fla.	1	0	4	Center of hurricane Sept. 22-Oct. 4 not far away.
1932	1	Sept. 19	Westover, West Baton Rouge Parish, La.	0	0	Considerable	Tropical storm Sept 18-21.
1933	3	Oct. 4-5	Miami, Dade County, Fla.	0	0	5	In northwest quadrant hurricane Oct. 1-9.
		Oct. 5	Hollywood, Broward County, Fla.	0	0	No estimate	
		Oct. 5	Pompano, Broward County, Fla.	0	0	No estimate	
1935	4	Sept. 4	Near Walterboro, Colleton County, S. C.	0	1	2	Four tornadoes in South Carolina with hurricane Aug. 31-Sept. 6.
		Sept. 5	Chapin, Lexington County, S. C.	0	0	2	
		Sept. 5	Near Florence, Florence County, S. C.	0	0	Slight	
		Sept. 5	Dillon, Dillon County, S. C.	0	0	2	
1937	1	Sept. 20	St. Johns County, Fla.	0	0	6	Tropical storm Sept. 16-21.
1940	1	Oct. 20	Gainesville, Alachua County, Fla.	0	0	Slight	Tropical storm Oct. 15-21.
1944	3	Oct. 18	Polk County, Fla.	0	0	Slight	In advance of hurricane Oct. 12-23.
		Oct. 18	Wauchula, Hardee County, Fla.	0	0	Slight	
		Oct. 18	Arcadia, De Soto County, Fla.	0	0	Slight	
1945	3	June 24	Melbourne, Brevard County, Fla.	0	0	4	Along forward edge hurricane June 20-27.
		Aug. 27	Houston, Tex.	1	15	35	On northern edge approaching hurricane Aug. 24-29 centered 60 miles southwest of Houston.
		Sept. 17	Gourdin, Williamsburg County, S.C.	1	2	100	Hurricane Sept. 11-20.
1947	12	Sept. 22	Tampa area, Hillsborough County, Fla.	0	0	6	Eleven tornadoes in Florida in 3 counties on northern edge tropical storm Sept. 20-25.
		Sept. 23	Jacksonville area, Duval County, Fla.	0	1	16	
		Sept. 23	Near Ocala, Marion County, Fla.	0	0	4	
		Sept. 19	Apalachicola, Franklin County, Fla.	2	100	250	On periphery of hurricane Sept. 10-19.
		Oct. 11-12	Miami, Dade County, Fla.	0	0	5	In northeast portion of hurricane Oct. 9-16.
1948	5	Sept. 4	Havana, Gladsden County, Fla.	2	0	250	Hurricane Sept. 3-6.
		Sept. 4	Milton, Santa Rosa County, Fla.	0	0	5	
		Sept. 21	Homestead, Dade County, Fla.	0	0	4	In northeast sector of hurricane Sept. 18-25.
		Oct. 5	Opa Locka, Dade County, Fla.	0	0	15	In forward sector of hurricane Oct. 3-15.
		Oct. 5	Ft. Lauderdale and Pompano, Broward County, Fla.	0	7	100	
1949	4	Aug. 28	Scotland County, N. C.	0	0	No estimate	Hurricane Aug. 23-31.
		Aug. 28	South of Raleigh, Wake County, N. C.	0	0	60	
		Aug. 28	Louisburg, Franklin County, N. C.	0	16	100	
		Aug. 28	Near Ridgeway, Vance County N. C.	0	0	No estimate	
1950	2	Aug. 30	Apalachicola, Franklin County, Fla.	0	0	35	In northeast quadrant of hurricane Aug. 20-Sept. 1.
		Aug. 31	Jackson County, Fla.	0	0	6	

Table 6.--TORNADOES ASSOCIATED WITH PASSAGE OF TROPICAL STORMS, 1916-58 (Continued)

Year	No. of tornadoes	Date	Location	Deaths	Injuries	Damage † (thous.)	Remarks	
1952	3	Aug. 31	Stokes County, N. C.	0	0	5	Hurricane "Able" Aug. 18-Sept. 2.	
		Aug. 31	Franconia, Fairfax County, Va.	0	0	35		
		Aug. 31	Potomac, Montgomery County, Md.	0	0	20		
1953	1	Oct. 9	Near Ft. Myers, Lee County, Fla.	0	0	3	Hurricane "Hazel" Oct. 7-12.	
1955	4	Aug. 10	Penderlea, Pender County, N. C.	0	1	10	In advance fringe of hurricane "Connie" Aug. 3-14	
		Aug. 10	Conway, Horry County, S. C.	0	4	10		
		Aug. 10	Near Dillon, Dillon County, S. C.	0	0	1		
		Aug. 19	Lancaster-Chester County line, Pa.	0	0	50		
1956	3	Sept. 24	Eridu, Taylor County, Fla.	0	0	100	In advance of hurricane "Flossy" Sept. 21-30	
		Sept. 24	Suwannee County, Fla.	0	0	20		
		Sept. 24	Wewahatchka, Gulf County, Fla.	0	0	35		
1957	29	June 8	Newberry, Alachua County, Fla.	0	0	2	Six tornadoes in Florida between 3 and 5:15 p.m., and 1 in Georgia at 8:15 p.m., with unnamed tropical storm June 8-14.	
		June 8	Near Ocala, Marion County, Fla.	0	0	1		
		June 8	Orange Park, Clay County, Fla.	0	0	25		
		June 8	Near Georgetown, Putnam County, Fla.	0	0	Slight		
		June 8	Jacksonville, Duval County, Fla.	0	0	12		
		June 8	Jacksonville, Duval County, Fla.	0	0	21		
		June 8	Jekyll Island, Glynn County, Ga.	0	0	12		
		June 27	Micheud, Orleans Parish, La.	0	0	20		Hurricane "Audrey" June 25-28.
		June 27	Philadelphia, Neshoba County, Pa.	0	9	55		
		June 27	Houston, Chickasaw County, Miss.	0	0	1		
		June 28	Near Brooksville, Noxubee County, Miss.	1	10	400		
		June 28	Clara, Wayne County, Miss.	0	0	100		Fifteen tornadoes in Alabama between 7:30 a.m., and 5:45 p.m., hurricane "Audrey" June 25-28, with no deaths, 15 injuries, and \$776 thousand damage from tornadoes.
		June 28	Batesville and northeast of Brundidge, Barbour County, Ala.					
		June 28	Butler Springs, Greenbille, Knob City, Liberty, and Oak Streak, Butler County, Ala.					
		June 28	Whatley area, Clarke County, Ala.					
		June 28	Evergreen and Skinnerton, Conecuh County, Ala.					
		June 28	Brooks, Covington County, Ala.					
		June 28	Luverne, Crenshaw County, Ala.					
		June 28	Devenport, Ft. Deposit, and Haynesville, Lowndes County, Ala.					
		June 28	Bermuda, Excel, and Frisco City, Monroe County, Ala.					
		June 28	Downing, Hope Hull, Sellers, and Sprague, Montgomery County, Ala.					
		June 28	Oakhill, Wilcox County, Ala.					
		June 29	Elkins, Randolph County, W. Va.	0	0	125-200		

† Damages are rough estimates made at the time of occurrence. Comparisons are impractical due to change in monetary values, metropolitan development, and population expansion.

Table 7.--TORNADO OCCURRENCES IN MAJOR CITIES AND SELECTED COMMUNITIES
(Two or More Cases from Beginning of Record to February 1959)

City or community	Date	Deaths	Damage in thousands of dollars	City or community	Date	Deaths	Damage in thousands of dollars	
Oklahoma City, Okla. 14 tornadoes	Mar. 22, 1893	0	15	Indianapolis, Ind. 10 tornadoes	Mar. 4, 1880	0	100	
	May 12, 1896	0	slight		May 18, 1927	2	3,000	
	June 12, 1942	35	200		July 24, 1934	1	11	
	Apr. 12, 1945	8	1,000		June 20, 1942	0	2	
	Feb. 18, 1946	0	slight		Apr. 9, 1944	0	5	
	Feb. 27, 1950	0	6		Mar. 26, 1948	0	slight	
	Apr. 30, 1951	*0	*160		May 31, 1954	0	slight	
	Apr. 30, 1951	0	0		June 13, 1954	0	1	
	Sept. 29, 1954	0	50		Mar. 22, 1955	0	10	
	May 11, 1955	0	0		Nov. 15, 1955	0	46	
	May 19, 1955	0	slight		Kansas City, Mo. 10 tornadoes	July 17, 1880	several	much
	May 26, 1955	0	20			May 13, 1883	4	300
	Apr. 2, 1957	0	slight			May 11, 1886	0	slight
	May 24, 1958	0	4			June 10, 1887	-	no estimate
Miami, Fla. 12 tornadoes	Apr. 13, 1917	0	7	July 16, 1927		0	25	
	Apr. 5, 1925	5	250	Oct. 6, 1941		4	250	
	July 14, 1926	0	slight	May 23, 1946		2	290	
	Sept. 28, 1929	*0	*20	May 8, 1949		0	2	
	Sept. 28, 1929	0	0	Oct. 9, 1949		0	5	
	Oct. 4 & 5, 1933	0	5	June 22, 1957		0	250	
	Apr. 9, 1937	0	10	Little Rock, Ark. 10 tornadoes	Dec. 8, 1885	0	slight	
	Oct. 11 & 12, 1947	0	5		Oct. 2, 1894	4	500	
	June 26, 1956	0	0		June 5, 1916	0	5	
	July 15, 1957	0	slight		Oct. 8, 1919	0	8	
Oct. 8, 1957	0	1	May 14, 1923		0	40		
July 25, 1958	0	0	Apr. 14, 1927		0	1		
Cincinnati, Ohio 12 tornadoes	May 28, 1809	*-	no estimate		Mar. 16, 1932	0	57	
	May 28, 1809	-	no estimate		Mar. 18, 1933	0	15	
	May 28, 1809	-	no estimate		Feb. 5, 1942	3	1,050	
	May 14, 1814	-	no estimate		Mar. 26, 1950	0	500	
	May 21, 1860	-	no estimate	St. Louis, Mo. 10 tornadoes	June 30, 1877	-	no estimate	
	May 21, 1862	-	no estimate		Jan. 12, 1890	0	25	
	Feb. 19, 1880	-	no estimate		May 27, 1896	306	12,904	
	Mar. 11, 1917	3	300		Aug. 19, 1904	3	100	
	Jan. 19, 1928	0	100		Sept. 29, 1927	72	22,000	
	June 18, 1928	0	100		Sept. 1, 1931	0	25	
May 2, 1954	0	250	May 1, 1948		*0	*slight		
July 11, 1958	0	10	May 1, 1948		0	0		
Wichita, Kans. 12 tornadoes	Apr. 17, 1914	0	slight		Aug. 28, 1948	0	0	
	July 31, 1920	0	slight		Feb. 10, 1959	21	no estimate	
	Apr. 23, 1923	0	1	Topeka, Kans. 10 tornadoes	July 21, 1887	-	no estimate	
	June 12, 1928	0	slight		Apr. 3, 1897	0	slight	
	Feb. 24, 1935	0	10		Sept. 1, 1904	0	slight	
	Apr. 17, 1939	0	slight		June 5, 1917	7	500	
	June 21, 1948	0	1,000		May 26, 1921	0	slight	
	June 21, 1953	0	0		June 3, 1927	0	slight	
	Oct. 4, 1954	0	40		June 16, 1928	*0	*slight	
	Oct. 26, 1954	0	4		June 16, 1928	0	slight	
June 7, 1958	0	10	June 22, 1929		0	slight		
June 11, 1958	0	no estimate	May 2, 1951		0	slight		
Charleston, S. C. 11 tornadoes	May 4, 1761	-	no estimate	Chicago, Ill. 9 tornadoes	May 6, 1876	-	250	
	Sept. 10, 1811	-	no estimate		May 25, 1896	0	100	
	Aug. 15, 1928	0	slight		Apr. 6, 1912	0	slight	
	May 21, 1935	0	slight		Mar. 28, 1920	28	3,000	
	Sept. 29, 1938	*32	*2,000		May 18, 1926	0	500	
	Sept. 29, 1938	0	0		Apr. 7, 1929	0	3	
	Sept. 29, 1938	0	0		May 1, 1933	4	500	
	Sept. 29, 1938	0	0		May 26, 1955	0	51	
	May 22, 1957	0	slight		Aug. 30, 1958	0	25	
	July 6, 1957	0	slight		Philadelphia, Pa. 8 tornadoes	Apr. 12, 1856	0	slight
Fort Smith, Ark. 10 tornadoes	June 27, 1879	0	slight	Aug. 3, 1885		2	500	
	Nov. 8, 1879	-	no estimate	July 13, 1892		-	no estimate	
	Jan. 12, 1898	52	450	Mar. 27, 1911		1	100	
	Mar. 16, 1919	0	500	Sept. 16, 1930		0	2	
	May 28, 1924	0	25	June 13, 1939		0	28	
	Apr. 23, 1926	0	25	July 19, 1951		0	slight	
	Apr. 12, 1927	2	115	July 14, 1958		0	5	
	May 1, 1929	0	54	(Over)				
	Dec. 17, 1929	0	2					
	Apr. 30, 1954	0	2					

Table 7.--TORNADO OCCURRENCES IN MAJOR CITIES AND SELECTED COMMUNITIES (Continued)
(Two or More Cases from Beginning of Record to February 1959)

City or community	Date	Deaths	Damage† in thousands of dollars	City or community	Date	Deaths	Damage† in thousands of dollars	
Terre Haute, Ind. 8 tornadoes	Nov. 11, 1879	-	no estimate	Gainesville, Ga. 4 tornadoes	Mar. 25, 1884	2	no estimate	
	Sept. 16, 1886	0	135		June 1, 1903	98	1,000	
	Dec. 5, 1909	0	25		Apr. 6, 1936	203	13,000	
	Mar. 23, 1913	21	1,000		Apr. 15, 1944	0	20	
	Sept. 29, 1921	0	15	Great Bend, Kans. 4 tornadoes	Nov. 10, 1915	11	1,000	
	May 18, 1927	0	15		May 4, 1950	0	250	
	Mar. 26, 1948	0	10		Sept. 22, 1955	1	0	
	May 21, 1949	3	1,000		Oct. 29, 1956	0	250	
New Orleans, La. 7 tornadoes	Nov. 24, 1884	-	no estimate	Louisville, Ky. 4 tornadoes	Mar. 27, 1890	78	4,000	
	Oct. 29, 1896	0	100		Mar. 18, 1925	3	100	
	Oct. 5, 1906	3	300		Jan. 12, 1928	0	84	
	Mar. 26, 1934	0	150		Jan. 19, 1928	0	85	
	Dec. 5, 1951	0	750	Milwaukee, Wis. 4 tornadoes	June 4, 1848	0	slight	
	July 17, 1953	0	50		Oct. 15, 1870	0	no estimate	
	July 13, 1957	0	slight		May 23, 1878	-	no estimate	
					June 14, 1891	-	4	
Denver, Colo. 6 tornadoes	Apr. 20, 1932	0	slight	Washington, D. C. 4 tornadoes	Apr. 5, 1923	0	100	
	July 19, 1932	0	3		May 14, 1927	0	slight	
	Apr. 18, 1933	0	no estimate		Nov. 17, 1927	0	690	
	Apr. 20, 1937	0	slight		May 21, 1943	0	slight	
	May 9, 1941	0	2	Wilkes Barre, Pa. 4 tornadoes	Nov. 18, 1886	-	10	
	May 15, 1941	0	0		Aug. 19, 1890	16	500	
			Aug. 21, 1914		7	much		
			Nov. 19, 1928		0	500		
Evansville, Ind. 6 tornadoes	Apr. 25, 1887	-	no estimate	Zanesville, Ohio 4 tornadoes	July 16, 1912	2	5	
	July 11, 1930	0	1		Sept. 21, 1921	0	500	
	Mar. 31, 1932	0	200		June 26, 1954	0	27	
	Mar. 2, 1940	1	150		Apr. 13, 1955	0	1	
	Apr. 14, 1944	0	5	Cleveland, Ohio 3 tornadoes	Apr. 27, 1943	0	1,000	
	Nov. 15, 1955	0	175		June 22, 1951	0	500	
			June 8, 1953		17	20,000		
St. Joseph, Mo. 6 tornadoes	Apr. 2, 1913	0	slight	Codell, Kans. 3 tornadoes	May 20, 1916	0	moderate	
	Mar. 3, 1923	0	50		May 20, 1917	0	no estimate	
	June 24, 1924	0	slight		May 20, 1918	0	no estimate	
	May 24, 1927	0	200		Heber Springs, Ark. 3 tornadoes	June 5, 1916	4	6
	Aug. 2, 1933	0	slight	Nov. 25, 1926		23	500	
	Oct. 4, 1949	0	30	Nov. 15, 1955		0	150	
			Mattoon, Ill. 3 tornadoes	Sept. 23, 1864		0	no estimate	
				June 4, 1877	0	no estimate		
				May 26, 1917	101	2,500		
Minneapolis, Minn. 5 tornadoes	Sept. 8, 1884	6	2,000	Atlanta, Ga. 2 tornadoes	July 12, 1881	-	no estimate	
	Aug. 20, 1904	14	1,500		Dec. 5, 1954	0	25	
	Apr. 5, 1929	6	1,000		Fostoria, Ohio 2 tornadoes	July 7, 1881	-	no estimate
	Sept. 4, 1941	5	450			Apr. 20, 1896	0	50
	July 20, 1951	5	6,000	Tinker Field, Okla. 2 tornadoes		Mar. 20, 1948	0	10,250
						Mar. 25, 1948	0	6,100
Omaha, Nebr. 5 tornadoes	Aug. 25, 1877	-	no estimate	Erie, Pa. 4 tornadoes	Nov. 17, 1890	-	no estimate	
	May 23, 1880	-	no estimate		Oct. 21, 1909	0	150	
	May 17, 1883	0	slight		July 29, 1954	0	slight	
	Mar. 23, 1913	95	3,500		Sept. 21, 1957	0	20	
	Apr. 6, 1919	0	250					
Wilmington, Del. 5 tornadoes	June 22, 1887	3	no estimate					
	Aug. 21, 1888	12	150					
	Apr. 18, 1938	0	50					
	July 6, 1941	0	5					
	Aug. 25, 1941	1	150					
Akron, Ohio 4 tornadoes	Feb. 11, 1887	-	no estimate					
	May 10, 1890	0	80					
	June 9, 1940	0	no estimate					
	Apr. 27, 1943	0	2,000					

† Damages are rough estimates made at the time of occurrence. Comparisons are impractical due to change in monetary values, metropolitan development, and population expansion.

* Total for tornadoes on this date.

Table 8.--SELECTED FAMILIES OF TORNAOES, 1916-58

Date	Number of hours	Number of tornadoes	Number of deaths	Damage† in thousands of dollars	States
June 5-6, 1916	35	32	100	\$305	Alabama, Arkansas, Mississippi, and South Carolina.
May 26-28, 1917	32	22	264	6,630	Missouri, Arkansas, Mississippi, Alabama, Tennessee, Kentucky, Indiana, and Illinois.
March 18, 1925	15	12	740	17,947	Kansas, Missouri, Tennessee, Kentucky, Alabama, Indiana, and Illinois.
May 1, 1930	8	33	15	2,354	Kansas, Missouri, Nebraska, Minnesota, Wisconsin, Iowa, and Illinois.
March 21, 1932	6	31	318	5,707	Alabama, Mississippi, Georgia, Tennessee, Indiana, and Illinois.
March 30-31, 1933	31	39	80	1,415	Texas, Oklahoma, Kansas, Arkansas, Louisiana, Mississippi, Alabama, and Florida.
April 5-6, 1936	20	14	462	16,677	Arkansas, Mississippi, Alabama, Georgia, South Carolina, and Tennessee.
March 30, 1938	21	30	47	2,442	Oklahoma, Kansas, Missouri, Arkansas, and Illinois.
April 16-17, 1939	33	24	41	332	Texas, Kansas, Arkansas, Louisiana, Mississippi, and Alabama.
May 20-21, 1949	33	48	55	8,752	Oklahoma, Colorado, Kansas, Nebraska, Missouri, Arkansas, Iowa, Kentucky, Tennessee, Indiana, and Illinois.
March 21-22, 1952	22	20	208	14,539	Missouri, Arkansas, Mississippi, Alabama, Tennessee, and Kentucky.
May 10, 1953,	20	30	12	3,993	South Dakota, Oklahoma, Kansas, Missouri, Nebraska, Minnesota, Arkansas, Iowa, and Wisconsin.
June 7, 1953	11	35	11	2,089	Montana, Colorado, Kansas, Nebraska, South Dakota, Minnesota, and Iowa.
March 24, 1954	10	24	0	383	Texas, Oklahoma, Colorado, Kansas, Missouri, and Arkansas.
April 30, 1954	21	32	2	2,391	Texas, Oklahoma, Missouri, Iowa, Arkansas, Mississippi, Louisiana, and Florida.
May 25-27, 1955	66	72	102	11,753	Texas, Oklahoma, Kansas, Nebraska, Missouri, Arkansas, and Illinois.
April 2-3, 1956	47	51	40	19,575	Oklahoma, Kansas, Nebraska, Wisconsin, Michigan, Illinois, Indiana, Kentucky, Tennessee, Missouri, Arkansas, and Mississippi.
May 20, 1957	12	37	44	3,554	Oklahoma, Colorado, Kansas, Missouri, Nebraska, and South Dakota.
Nov. 16-17, 1958	22	37	0	705	Texas, Oklahoma, Kansas, Missouri, Arkansas, and Indiana.

† Damages are rough estimates made at the time of occurrence. Comparisons are impractical due to change in monetary values, metropolitan development, and population expansion.

Table 9.--LIST OF MORE DAMAGING TORNAOES IN EACH STATE

State & Date	Deaths	Damage† in thousands of dollars	Location
ALABAMA			
Apr. 20, 1920	46	\$1,000	Fayette to Madison Counties.
Apr. 20, 1920	44	1,000	Marion, Franklin, Colbert, and Lawrence Counties.
Mar. 21, 1932	37	Considerable	Tuscaloosa County.
Feb. 12, 1945	26	1,700	Montgomery.
Apr. 15, 1956	25	1,000	Birmingham area.
Mar. 21, 1932	23	Considerable	Perry to Randolph Counties.
May 5, 1933	21	254	Bibb to St. Clair Counties.
Oct. 25, 1925	18	250	Butler, Crenshaw, Pike, Bullock, and Barbour Counties.
Mar. 28, 1920	17	150	Deatsville.
Mar. 21, 1932	14	No estimate	Shelby and Talladega Counties.
Jan. 11, 1918	12	100	Cowarts and Webb.
May 27, 1924	12	30	Lathrop, Empire, and White Sulphur Spring.
Nov. 24, 1949	10	3	Hackneyville.
Apr. 18, 1953	6	5,000	Auburn.
Apr. 8, 1957	2	1,000	Morgan and Marshall Counties.
Nov. 18, 1957	1	1,000	Jefferson County.
ARIZONA			
Aug. 29, 1957	0	10	Sentinel.
June 13, 1955	0	8	Queen Creek.
ARKANSAS			
Mar. 21, 1952	57	3,727	Howard to Craighead Counties.
Jan. 3, 1949	57	1,318	Warren area.
Apr. 15, 1921	51	1,225	Miller, Hempstead and Pike Counties.
Mar. 21, 1952	40	1,573	Lonoke to Poinsett Counties.
June 1, 1947	35	1,000	Pine Bluff area.
Apr. 10, 1929	31	308	Cleburne to Greene Counties.
Oct. 29, 1942	29	500	Berryville.
Apr. 12, 1945	27	500	Logan to Carroll Counties.
Apr. 16, 1939	27	20	Drew County.
Mar. 18, 1927	24	503	Green Forest.
May 9, 1927	24	500	Strong.
Nov. 25, 1926	23	438	Heber Springs.
Mar. 26, 1949	19	No estimate	Whelen Springs to Harrisburg.
Apr. 10, 1929	18	200	Cross County.
Apr. 18, 1920	18	100	Yell, Logan, and Johnson Counties.
Oct. 26, 1941	15	125	Hamburg.
Mar. 21, 1952	14	1,446	Lonoke to Mississippi Counties.
Apr. 10, 1944	14	100	Near Shiloh and Duncan.
May 18, 1930	14	15	Arkansas and Phillips Counties.
May 27, 1917	12	43	Manila.
Apr. 21, 1929	12	1	Tillar.
Mar. 17, 1927	12	No estimate	Pike to Saline Counties.
May 9, 1927	10	300	Hoxie and Walnut Ridge.
May 9, 1927	10	5	Egypt.
Feb. 5, 1942	3	1,050	Little Rock.
Dec. 12-13, 1931	1	1,250	Columbia and Ouachita Counties.
CALIFORNIA			
Jan. 11, 1951	0	1,500	Los Altos-Sunnyvale area.
Apr. 6, 1926	0	100	National City.
Nov. 15, 1952	0	100	Orange County.
COLORADO			
Aug. 10, 1924	10	6	Washington County.
June 6, 1947	0	497	Julesburg.
Nov. 4, 1922	4	105	Sugar City to Genoa.
June 29, 1928	3	250	Johnstown.
Apr. 30, 1942	4	50	Kiowa County.
Oct. 2, 1930	3	10	Pueblo County.

Table 9.--LIST OF MORE DAMAGING TORNAOES IN EACH STATE, 1916-58 (Continued)

State & Date	Deaths	Damage† in thousands of dollars	Location
CONNECTICUT			
June 19, 1957	0	\$ 350	Hartford County.
Aug. 21, 1951	0	135	Litchfield and Middlesex Counties.
July 14, 1950	0	100	Ridgefield.
DELAWARE			
Aug. 25, 1941	0	150	Wilmington.
Apr. 18, 1938	0	50	Wilmington.
DISTRICT OF COLUMBIA			
Nov. 17, 1927	0	300	
FLORIDA			
Jan. 18, 1936	7	25	Washington and Jackson Counties.
Apr. 5, 1925	5	250	Hialeah.
Mar. 30, 1939	4	20	Duval County.
Apr. 10, 1956	0	1,000	Dania and Hollywood.
Sept. 19, 1947	2	250	Apalachicola.
Sept. 4, 1948	2	250	Gadsden County.
Apr. 15, 1958	0	750	Ft. Pierce.
Oct. 19, 1958	1	400	Pahokee.
GEORGIA			
Apr. 6, 1936	203	13,000	Gainesville.
Apr. 30, 1953	18	15,000	Warner Robbins Air Force Base.
Apr. 18, 1953	2	15,000	Columbus area.
Mar. 13, 1954	2	6,000	Lawson Air Force Base.
Mar. 28, 1920	33	1,250	La Grange and West Point.
Apr. 25, 1929	40	850	Candler and Bulloch Counties.
Feb. 10, 1921	28	Considerable	Gardners and Oconee.
Apr. 2, 1936	23	3,000	Cordele.
Apr. 16, 1944	23	1,000	Franklin and Hart Counties.
Feb. 10, 1940	18	3,200	Albany.
Mar. 22, 1932	12	60	Clarke and Madison Counties.
Apr. 25, 1929	11	275	Bleckley, Dodge, and Laurens Counties.
Apr. 30, 1924	10	40	Chipley
Mar. 13, 1954	5	3,175	Taylor, Crawford, and Bibb Counties.
IDAHO			
Apr. 26, 1940	0	25	Gooding County.
June 7, 1936	2	4	Nez Perce County.
ILLINOIS			
Mar. 18, 1925	606	13,193	Tri-State.
May 26, 1917	101	2,500	Mattoon-Charleston.
Mar. 19, 1948	33	3,765	Gillespie-Bunker Hill.
Mar. 28, 1920	20	2,000	Will, Du Page, and Cook Counties.
Apr. 19, 1927	21	1,349	Calhoun to Ford Counties.
Sept. 14, 1928	14	1,200	Rockford.
Dec. 18, 1957	11	2,000	Jackson, Williamson, and Franklin Counties.
Sept. 29, 1927	7	3,000	Madison.
June 14, 1957	2	3,000	Springfield.
Mar. 28, 1920	8	1,000	Elgin.
Mar. 15, 1938	13	905	Adams to Woodford Counties.
Mar. 16, 1942	11	200	Vermilion County.
Mar. 15, 1938	10	550	Belleville and O'Fallon.
Feb. 25, 1956	6	1,700	St. Clair and Clinton Counties.
May 21, 1949	5	1,300	Wood River.
June 27, 1945	1	2,300	Rock Island to La Salle Counties
Apr. 9, 1953	1	2,250	Champaign and Vermilion Counties.
May 9, 1927	1	1,125	Morrisonville to Decatur.
June 27, 1951	1	1,005	Homer and Latham.
Dec. 18, 1957	1	1,000	Mount Vernon.

Table 9.--LIST OF MORE DAMAGING TORNAOES IN EACH STATE, 1916-58 (Continued)

State & Date	Deaths	Damage† in thousands of dollars	Location
ILLINOIS (Cont.)			
Apr. 12, 1945	0	\$2,230	Adams, Hancock, and McDonough Counties.
June 27, 1951	0	1,250	Emden-Hartsburg.
INDIANA			
Mar. 18, 1925	70	2,775	Tri State.
Mar. 26, 1948	20	3,000	Coatesville-Danville.
May 21, 1949	14	1,000	Sullivan and Clay Counties.
Mar. 28, 1920	14	No estimate	Jay and Adams Counties.
Mar. 28, 1920	13	1,000	Wells, Adams, and Allen Counties.
Mar. 11, 1917	21	600	Henry and Wayne Counties.
Apr. 17, 1922	14	400	Warren to Jay Counties.
Mar. 28, 1920	12	350	Wayne and Randolph Counties.
Apr. 9, 1953	2	1,000	Attica to Muncie.
May 18, 1927	1	3,000	Indianapolis.
Mar. 6, 1956	1	2,000	Marion.
Mar. 3, 1955	0	1,250	Lake to Allen Counties.
Mar. 17, 1945	0	1,000	Posey, Vanderburgh, Warrick, and Dubois Counties.
IOWA			
May 21, 1918	10	900	Boone to Grundy Counties.
May 9, 1918	8	500	Butler to Winneshick Counties.
June 25, 1951	1	6,000	Duncan.
Sept. 28, 1923	6	15	Council Bluffs.
Apr. 23, 1948	5	250	Ionia.
Aug. 26, 1928	4	400	Montgomery, Cass, and Adams Counties.
June 23, 1952	0	1,000	Cherokee County.
May 10, 1953	0	1,000	Ventura to Northwood.
KANSAS			
May 25, 1955	80	2,225	Udall.
June 10, 1958	15	3,000	Eldorado.
May 25, 1917	23	600	Sedgwick and Harvey Counties.
Apr. 29, 1942	15	100	Decatur County.
May 7, 1927	10	1,300	Comanche to McPherson Counties.
Mar. 30, 1938	10	575	Labette and Cherokee Counties.
May 20, 1918	10	450	Ellis and Osborne Counties.
May 20, 1957	7	1,010	Williamsburg.
June 26-27, 1951	5	2,080	Wakeeney.
June 8, 1941	8	180	Sedgwick, Butler, and Marion Counties.
June 5, 1917	7	500	Topeka.
July 4, 1932	5	500	Washington County.
May 22, 1933	4	750	Seward County.
July 13, 1924	1	2,000	Augusta.
June 21, 1948	0	1,000	Wichita.
June 15, 1957	0	1,000	Kensington.
KENTUCKY			
May 27, 1917	68	2,000	Fulton, Hickman, Carisle, and Graves Counties.
May 9, 1933	34	200	Monroe to Russell Counties.
Mar. 16, 1942	24	312	Muhlenberg to Nelson Counties.
Mar. 18, 1925	12	100	Allen to Adair Counties.
LOUISIANA			
May 1, 1933	23	1,250	Minden.
Dec. 31, 1947	18	1,500	Haynesville-Cotton Valley.
Feb. 17, 1938	21	250	Rodessa.
Nov. 7, 1957	3	1,118	Boyce to Alexandria.
Feb. 12, 1950	18	280	Shreveport.
Feb. 17, 1927	17	100	Pleasant Hill.
Apr. 4, 1923	14	750	Alexandria and Pineville.
Feb. 17, 1927	14	55	Lake Bruin.
Nov. 25, 1926	11	12	Morehouse Parish.

Table 9.--LIST OF MORE DAMAGING TORNAOES IN EACH STATE, 1916-58 (Continued)

State & Date	Deaths	Damage† in thousands of dollars	Location
MAINE			
Aug. 11, 1954	1	\$10	Near Caribou.
May 16, 1929	0	25	Portland area.
July 7, 1954	0	20	Calais.
MARYLAND			
June 23, 1944	2	1,000	Cambridge.
Nov. 9, 1926	17	100	La Plata.
June 23, 1944	3	150	Garrett County.
MASSACHUSETTS			
June 9, 1953	90	52,193	Worcester.
MICHIGAN			
June 8, 1953	116	19,000	Flint area.
Apr. 3, 1956	18	10,500	Allegan, Ottawa, Kent, and Montcalm Counties.
May 12, 1956	3	4,000	Flint area.
June 6, 1917	4	1,000	Battle Creek, Eden, and Williamston.
May 21, 1953	2	2,500	St. Clair County.
Aug. 8, 1939	2	1,050	Kalamazoo County.
May 2, 1930	0	1,050	Ottawa to Gratiot Counties.
Apr. 3, 1956	0	1,010	Van Buren, Allegan, Kent, and Barry Counties.
Jan. 19, 1933	0	1,000	Monroe County.
June 17, 1946	0	1,000	Wayne County.
MINNESOTA			
June 22, 1919	59	3,500	Fergus Falls.
Aug. 21, 1918	36	1,000	Tyler.
June 18, 1939	9	1,200	Anoka.
July 20, 1951	5	6,000	Minneapolis-St. Paul.
Aug. 17, 1946	11	225	Blue Earth County.
Aug. 20, 1928	6	1,000	Freeborn and Mower Counties.
Apr. 5, 1929	6	1,000	Minneapolis.
MISSISSIPPI			
Apr. 5, 1936	216	3,000	Tupelo.
Dec. 5, 1953	38	25,000	Vicksburg.
Mar. 16, 1942	65	625	Leflore to Lee Counties.
Apr. 20, 1920	43	Considerable	Oktibbeha, Clay, and Monroe Counties.
Apr. 20, 1920	36	Considerable	Jasper and Lauderdale Counties.
Mar. 16, 1919	35	1,000	Issaquena to Sunflower Counties.
Apr. 20, 1920	27	Considerable	Neshoba to Lowndes Counties.
Apr. 20, 1920	24	Considerable	Union County.
Feb. 25, 1929	19	Considerable	Bolivar and Quitman Counties.
Mar. 31, 1933	16	15	Jasper County.
Apr. 26, 1921	15	Considerable	Braxton.
June 6, 1916	13	275	Jackson.
Jan. 6, 1946	12	247	Carroll County.
Mar. 31, 1933	12	20	Clarke County.
Apr. 6, 1935	11	190	Wilkinson and Amite Counties.
Nov. 26, 1926	10	Considerable	Marks.
Feb. 16, 1956	1	1,000	Prairie to Aberdeen.
MISSOURI			
Sept. 29, 1927	72	22,000	St. Louis.
May 9, 1927	87	2,132	Poplar Bluff.
May 20, 1957	37	Millions	Jackson and Ray Counties.
May 21, 1949	23	3,500	Cape Girardeau.
May 21, 1957	8	5-10 million	Reynolds to St. Francois Counties.
Mar. 21, 1952	17	1,425	Cooter to Cottonwood Point.
Apr. 29, 1947	14	772	Worth County.
Mar. 18, 1925	13	564	Tri-State.
Apr. 19, 1916	9	1,000	Vernon to Cole Counties.
May 8, 1927	10	346	Camden to Audrain Counties.

Table 9.--LIST OF MORE DAMAGING TORNAOES IN EACH STATE, 1916-58 (Continued)

State & Date	Deaths	Damage† in thousands of dollars	Location
MISSOURI (Cont.)			
Mar. 11, 1920	10	\$200	Melva.
Mar. 15, 1938	10	65	Dunklin, Pemiscot, and New Madrid Counties.
Dec. 18, 1957	3	1,000	Chaffee.
Aug. 21, 1952	1	1,500	Sedalia.
Nov. 16, 1952	0	1,300	Hopkins and Burlington Junction.
MONTANA			
June 10, 1923	2	No estimate	Rivulet.
July 19, 1952	1	326	Wibaux.
Aug. 20, 1947	0	350	Daniels County.
Sept. 16, 1946	0	300	Richland County.
July 19, 1948	1	68	Three Forks.
NEBRASKA			
June 7, 1953	11	156	Near Arcadia.
May 9, 1953	5	2,500	Hebron to Milford.
Apr. 25, 1957	1	1,500	Seward to Douglas Counties.
NEVADA			
Apr. 18, 1949	0	Slight	Washoe County - Only tornado reported in State
NEW HAMPSHIRE			
May 5, 1929	0	200	Berlin.
June 9, 1953	0	100	Exeter.
July 23, 1946	1	60	Concord.
NEW JERSEY			
May 24, 1933	0	1,000	Camden and Burlington Counties.
Aug. 25, 1941	1	400	Swedesboro and Hopelawn.
Apr. 1, 1929	1	55	Blairstown.
NEW MEXICO			
May 31, 1930	3	150	Mora County.
May 24, 1957	0	450	Curry County.
NEW YORK			
June 10, 1945	0	5,000	Jamestown.
July 23, 1920	2	200	Allegany County.
NORTH CAROLINA			
Apr. 2, 1936	14	2,015	Guilford, Alamance, and Orange Counties.
Jan. 5, 1931	6	35	Warren County.
NORTH DAKOTA			
June 20, 1957	10	10-15 million	Fargo area.
July 3, 1947	8	200	Walsh County.
June 24, 1923	7	Considerable	Bowman and Adams Counties.
OHIO			
June 8, 1953	17	20,000	Cleveland area.
June 28, 1924	85	12,000	Lorain-Sandusky.
Mar. 28, 1920	16	500	Darke, Auglaize, and Allen Counties.
Mar. 28, 1920	10	500	Paulding to Lucas Counties.
Apr. 27, 1943	0	2,000	Medina and Summit Counties.
July 19, 1950	0	2,000	Lima.
June 18, 1928	2	1,000	Franklin to Washington Counties.
Aug. 13, 1943	1	1,000	Canton
May 9, 1933	0	1,000	Dayton area.
Apr. 27, 1943	0	1,000	Cleveland.
OKLAHOMA			
Apr. 9, 1947	101	8,023	Ellis, Woodward, and Woods Counties.
Apr. 12, 1945	69	1,525	Antlers.

Table 9.--LIST OF MORE DAMAGING TORNADES IN EACH STATE, 1916-58 (Continued)

State & Date	Deaths	Damage† in thousands of dollars	Location
OKLAHOMA (Cont.)			
Mar. 20, 1948	0	\$10,250	Will Rogers and Tinker Fields.
May 25, 1955	20	8,015	Blackwell.
Mar. 25, 1948	0	6,100	Tinker Field.
May 2, 1920	60	175	Peggs.
Apr. 27, 1942	52	2,000	Claremore and Pryor.
June 12, 1942	35	200	Oklahoma City.
Nov. 19, 1930	23	250	Oklahoma County.
May 2, 1942	16	116	Pottawatomie to Creek Counties.
Apr. 12, 1945	13	1,400	Muskogee.
Mar. 25, 1948	13	328	Hughes, McIntosh, Muskogee, and Sequoyah Counties.
Apr. 18, 1927	11	125	Choctaw County.
Apr. 9, 1919	11	50	Roberta and Durant.
Jan. 22, 1957	10	150	Gans.
Mar. 13, 1922	10	50	Gowen.
Apr. 12, 1945	8	1,000	Oklahoma City.
May 10, 1947	6	1,000	Leedey.
Apr. 2, 1956	5	1,000	Lincoln and Creek Counties.
June 16, 1928	4	1,500	Blair and Headrick.
Mar. 30, 1949	4	1,087	Kenton and Longdale.
Apr. 2, 1957	2	1,500	Marshall County.
Feb. 13, 1946	1	1,000	Ardmore.
OREGON			
Apr. 15, 1925	0	10	Condon.
Apr. 12, 1957	0	4	Clackamas.
PENNSYLVANIA			
June 23, 1944	25	1,000	Washington, Greene, and Fayette Counties.
June 23, 1944	17	1,000	Beaver to Somerset Counties.
June 7, 1947	3	1,000	Mercer County.
Apr. 5, 1952	0	1,500	Wrightsville and York.
May 13, 1956	0	1,000	Beaver to Somerset Counties.
RHODE ISLAND			
Dec. 1, 1934	0	5	Washington County. Only tornado reported in State.
SOUTH CAROLINA			
Apr. 30, 1924	67	1,000	Aiken to Florence Counties.
Apr. 30, 1924	9	2,000	Anderson to York Counties.
May 5, 1933	19	350	Anderson to Spartanburg Counties.
Apr. 16, 1944	18	300	Anderson to Newberry Counties.
Apr. 8, 1957	0	1,001	Lancaster, Chesterfield, and Marlboro Counties.
SOUTH DAKOTA			
July 31, 1949	0	1,000	Beresford and Elk Point.
Sept. 13, 1928	4	245	Yankton and Turner Counties.
TENNESSEE			
Mar. 21, 1952	21	2,500	Henderson.
May 9, 1933	33	100	Overton County.
Mar. 18, 1925	26	100	Sumner County.
Mar. 11, 1923	20	100	Deanburg to Pinson.
Mar. 14, 1933	15	2,200	Nashville area.
Mar. 26, 1944	0	4,000	Memphis.
Feb. 29, 1952	2	3,000	Fayetteville.
Apr. 3, 1956	3	1,250	Lexington.
Mar. 16, 1942	17	500	Chester, Henderson, Decatur, and Humphreys Counties.
Mar. 14, 1933	12	375	Claiborne County.
May 27, 1917	12	120	Dyersburg area.
Mar. 14, 1933	11	200	Sullivan County.
Mar. 21, 1952	10	555	Chesterfield.

Table 9.--LIST OF MORE DAMAGING TORNAOES IN EACH STATE, 1916-58 (Continued)

State & Date	Deaths	Damage† in thousands of dollars	Location
TENNESSEE (Cont.)			
Jan. 14, 1932	10	\$ 75	Gibson County
Jan. 22, 1957	0	1,800	Nashville.
TEXAS			
May 11, 1953	114	41,150	Waco.
Apr. 9, 1947	68	1,550	White Deer and Higgins.
Apr. 12, 1927	74	1,230	Rocksprings.
Apr. 9, 1919	42	450	Henderson, Van Zandt, Wood, Camp, and Red River Counties.
May 6, 1930	41	2,100	Hill to Ellis Counties.
Apr. 2, 1957	10	4,000	Dallas
May 15, 1949	6	4,779	Amarillo.
May 11, 1953	11	3,239	San Angelo area.
Apr. 28, 1942	11	1,500	Crowell.
Jan. 4, 1946	10	1,500	Nacogdoches County.
May 6, 1930	36	127	Karnes and De Witt Counties.
May 9, 1927	28	900	Collin, Hunt, Fannin, and Lamar Counties.
May 15, 1957	21	500	Silverton.
May 14, 1923	23	50	Howard and Mitchell Counties.
Apr. 9, 1919	20	125	Fannin County.
Mar. 13, 1953	17	600	Jud, O'Brien, and Knox City.
Jan. 4, 1946	15	500	Anderson County.
June 10, 1938	14	110	Clyde.
Apr. 13, 1921	12	500	Melissa & Petty.
May 4, 1922	12	500	Austin.
May 9, 1927	11	100	Garland.
Mar. 30, 1933	10	200	Angelina, Nacogdoches, and San Augustine Counties.
Apr. 8, 1922	12	82	Rowena and Oplin.
May 3, 1948	3	2,000	McKinney.
Apr. 6, 1955	1	2,850	Sherman.
June 1, 1954	1	2,612	Cottle County.
Nov. 7, 1957	2	2,225	Groves.
May 10, 1943	4	1,000	Rusk County.
Nov. 7, 1957	1	1,500	Orange.
June 6, 1951	0	1,500	White Deer.
Apr. 27, 1958	0	1,475	McKinney.
Apr. 8, 1944	1	1,000	Pottsville.
Mar. 24, 1936	0	1,200	Gregg County.
Apr. 5, 1955	0	1,000	Stamford and Woodson.
Apr. 26, 1957	0	1,000	Tyler.
UTAH			
May 25, 1954	0	8	Laketown.
Aug. 7, 1957	0	6	Salina.
VERMONT			
June 18, 1957	0	58	Franklin to West Berkshire.
July 17-18, 1927	0	20	North Troy and Elkhurst.
VIRGINIA			
May 2, 1929	13	100	Rye Cove.
May 2, 1929	3	200	Woodville and Flint Hill.
May 2, 1929	6	50	Lagrange-Weaversville.
WASHINGTON			
June 26, 1958	0	20	Wallula Junction.
Oct. 2, 1951	0	10	Battle Ground.
WEST VIRGINIA			
June 23, 1944	100	*2,000	Harrison, Barbour, Upshur, Taylor and Randolph Counties
June 23, 1944	3		Tucker County.
June 23, 1944	0		Brooke, Preston, and Grant Counties.

Table 9.--LIST OF MORE DAMAGING TORNADES IN EACH STATE, 1916-58 (Continued)

State & Date	Deaths	Damage† in thousands of dollars	Location
WISCONSIN			
Sept. 21, 1924	26	\$564	Eau Claire to Oneida Counties.
June 4, 1958	19	7,010	Woodville-Colfax.
Apr. 5, 1929	12	725	Pierce to Iron Counties.
Sept. 21, 1924	10	250	Barron to Ashland Counties.
June 22, 1944	7	1,023	Lafayette County.
Apr. 3, 1956	7	1,000	Berlin area.
June 4, 1958	4	1,500	Chippewa Falls.
June 13, 1930	6	1,000	Pierce to Clark Counties.
May 10, 1953	4	1,000	Pierce to Douglas Counties.
May 10, 1953	0	1,000	Buffalo to Price Counties.
WYOMING			
June 25, 1942	2	Many thousands	Platte County.
June 26, 1928	0	360	Natrona County.
ALASKA** (None reported)			
HAWAII			
Jan. 21, 1957	0	10	Wahiawa Valley.
Mar. 19, 1955	0	1	Hilo.

† Damages are rough estimates made at the time of occurrence. Comparisons are impractical due to change in monetary values, metropolitan development, and population expansion.

* Total for tornadoes on this date in State.

** Small tornado reported on Kayak Island, Alaska, November 4, 1959.

Table 10.--NUMBER OF WATERSPOUTS AND DAYS FOR STATES AND UNITED STATES, 1948-58

State	January		February		March		April		May		June		July		August		September		October		November		December		Total		
	No.	Days	No.	Days	No.	Days	No.	Days	No.	Days	No.	Days	No.	Days	No.	Days	No.	Days	No.	Days	No.	Days	No.	Days	No.	Days	
Ala.					2	2					2	2			3	1			10	2	1	1			5	3	
Calif.	1	1																								14	6
Del.											1	1														1	1
Fla.	2	2	1	1	2	2	3	3	13	11	25	12	31	16	15	11	16	12	7	6	4	1	1	1	120	78	
Ind.									2	1							2	1							4	2	
La.									3	3	1	1	7	4	2	2									13	10	
Maine											1	1									1	1			2	2	
Md.																	12	1							12	1	
Mass.																	2	1							2	1	
Mich.									2	2					6	4	5	2							13	8	
Miss.													1	1												1	1
N. H.											1	1														1	1
S. C.													1	1	3	3										4	4
S. Dak.													1	1	1	1										1	1
Tex.			1	1					17	8	3	3	11	8	3	3	3	3	1	1	1	1			37	25	
Wis.													3	2	1	1										4	3
Alaska			2	2																						2	2
Hawaii					1	1																				1	1
United States	3	3	4	4	5	5	3	3	20	17	48	24	46	24	42	30	40	20	18	9	7	4	1	1	237	144	

TABLE 11--NUMBER OF FUNNELS ALOFT AND DAYS BY MONTHS AND YEARS IN UNITED STATES, 1953-58

Year	January		February		March		April		May		June		July		August		September		October		November		December		Total			
	No.	Days	No.	Days	No.	Days	No.	Days	No.	Days	No.	Days	No.	Days	No.	Days	No.	Days	No.	Days	No.	Days	No.	Days	No.	Days		
1953					4	3	8	3	19	8	21	11	10	7	15	7			1	1					4	2	82	42
1954	2	1	1	1	7	3	20	10	21	9	29	14	2	2	12	10	7	3	2	2	1	1				104	56	
1955			2	2	2	2	19	8	67	16	109	20	19	8	15	13	6	6	3	1						242	76	
1956					2	2	27	7	86	16	31	13	79	23	30	12	1	1	17	8	1	1	1	1	1	275	84	
1957	1	1			26	8	164	19	243	26	214	27	50	18	29	17	14	6	12	7	11	5	8		2	772	136	
1958	5	1	5	4	9	7	93	21	94	21	200	26	203	30	52	20	42	20	10	8	11	5				724	163	
Totals	8	3	8	7	50	25	331	68	530	96	604	111	363	88	153	79	70	36	45	27	24	12	13	5	2,199	557		

Table 12.--NUMBER OF FUNNELS ALOFT FOR STATES AND UNITED STATES BY MONTHS, 1953-58

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Ala.				1		3	2		1		1		8
Ariz.	1	1	2				4	3		2			13
Ark.				3	3	3	5	4			1		19
Calif.		2	3	6	1					1			13
Colo.				4	5	10	17	2					38
Conn.													0
Del.													0
D. C.													0
Fla.	2	1	6	6	4	11	16	22	8	1	10	4	91
Ga.			1		4	2	2	2					11
Idaho				1		4		1					6
Ill.			4	6	5	2	3	2				2	24
Ind.				8	6	20	16	7	1			1	59
Iowa				1	9	6		2					18
Kans.		1	3	33	105	132	42	17	10	1			344
Ky.						1	1					1	3
La.			3	1	11	8	5	2	5	4	1	1	41
Maine							1						1
Md.							1						1
Mass.					2	1	1						4
Mich.				4	11	15	4	2					36
Minn.					2	23	24	20					69
Miss.		2		4	5	3	4	2			1		21
Mo.			1	12	28	51	51	4		1		1	149
Mont.						8	3						11
Nebr.			1	5	15	27	41	2					91
Nev.					5								5
N. H.					2								2
N. J.													0
N. Mex.				3	2	2	1	1	1	1			11
N. Y.				1									1
N. C.									1				1
N. Dak.					3	25	18	6	2	1			55
Ohio				1	2	3	7						13
Okla.			4	77	98	64	22	4	11		3		283
Oreg.					1	2							3
Pa.													0
R. I.													0
S. C.					1				1	1			3
S. Dak.				3	3	21	4	8					39
Tenn.				4			1	1			1		7
Tex.	5	1	22	147	189	152	52	34	29	30	6	3	670
Utah					2	1		1					4
Vt.													0
Va.								1					1
Wash.					2								2
W. Va.								1					1
Wis.					3	2	11			2			18
Wyo.					1	2	4	2					9
Alaska													0
Hawaii													0
U.S. Total	8	8	50	331	530	604	363	153	70	45	24	13	2,199

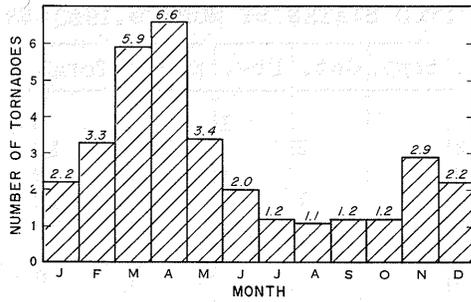


Figure 4.--Mean monthly number of tornadoes in the Alabama-Florida-Georgia-Louisiana-Mississippi area, 1916-58. Based on 1,429 tornadoes.

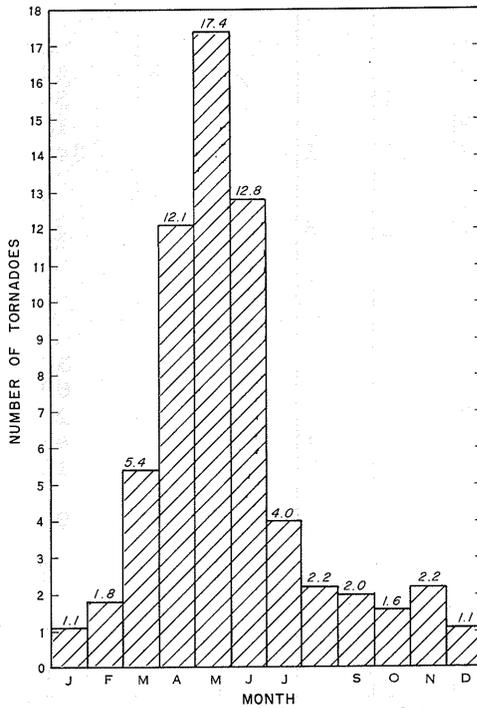


Figure 5.--Mean monthly number of tornadoes in the Arkansas-Kansas-Missouri-Oklahoma area, 1916-58. Based on 2,739 tornadoes.

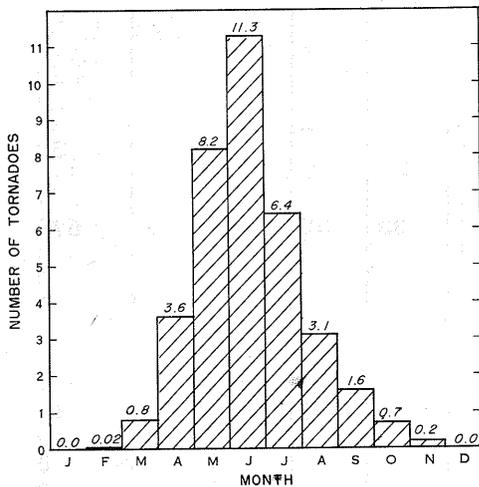


Figure 6.--Mean monthly number of tornadoes in the Iowa-Minnesota-Nebraska-North Dakota-South Dakota area, 1916-58. Based on 1,544 tornadoes.

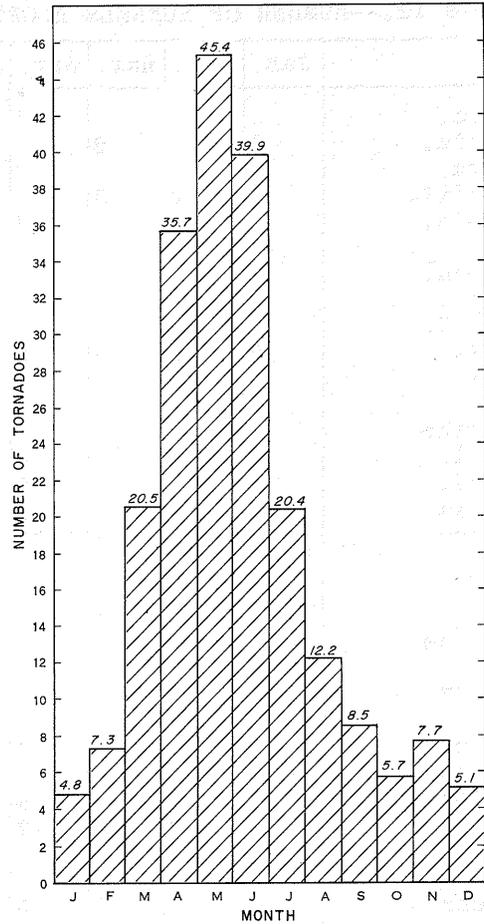


Figure 7.--Mean monthly number of tornadoes in the United States, 1916-58. Based on 9,167 tornadoes.

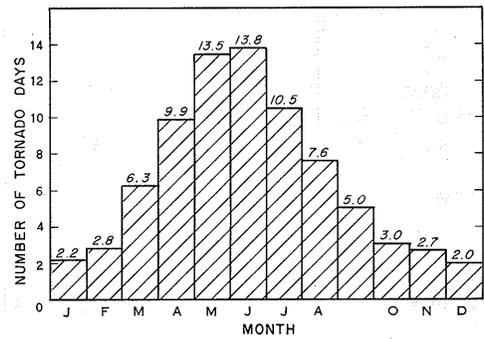


Figure 8.--Mean monthly number of tornado days in the United States, 1916-58. Based on the 3,412 days on which tornadoes were reported.

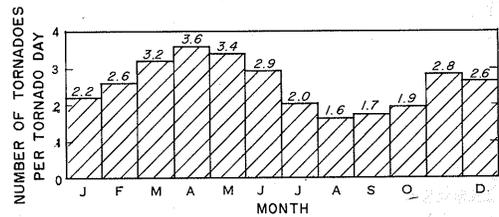
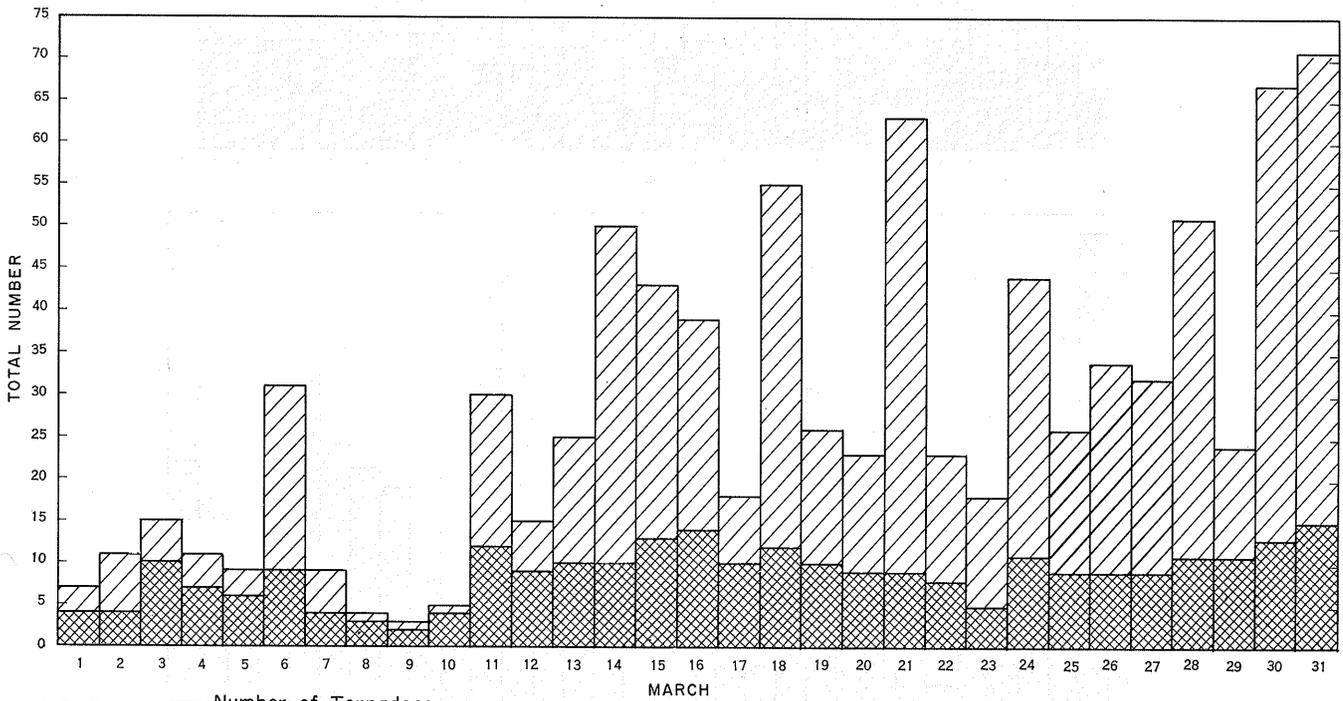
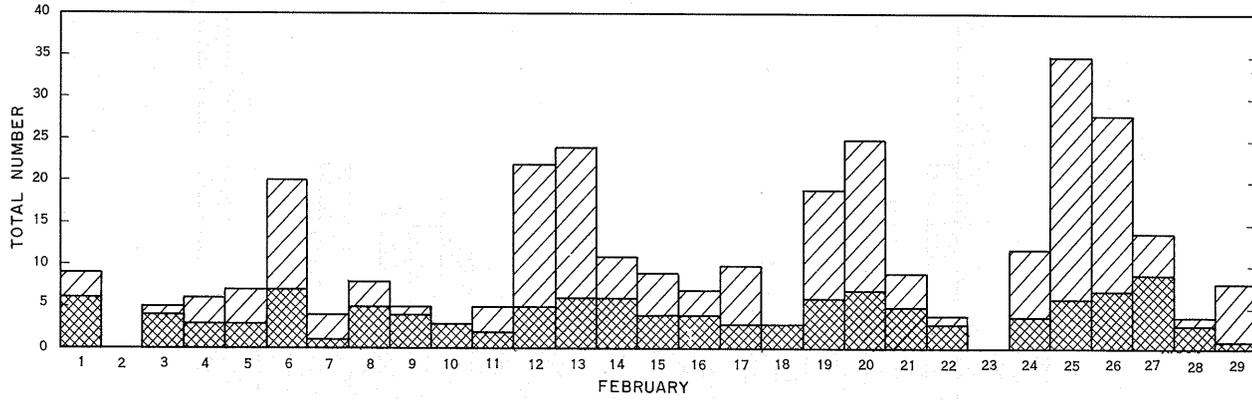
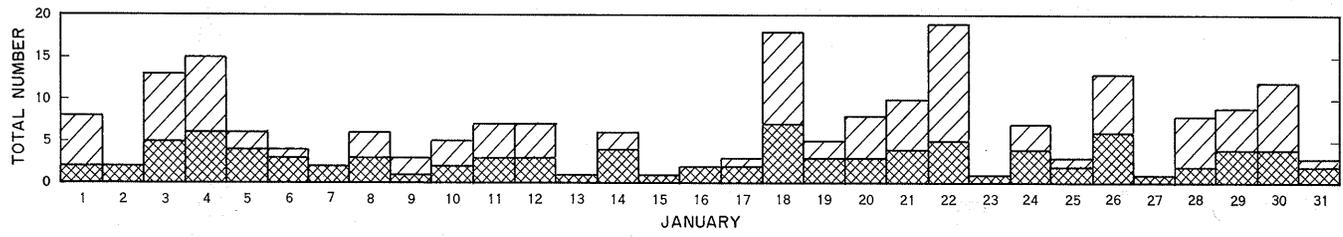


Figure 9.--Mean monthly number of tornadoes per tornado day in United States, 1916-58. Based on 9,167 tornadoes that occurred on 3,412 days.

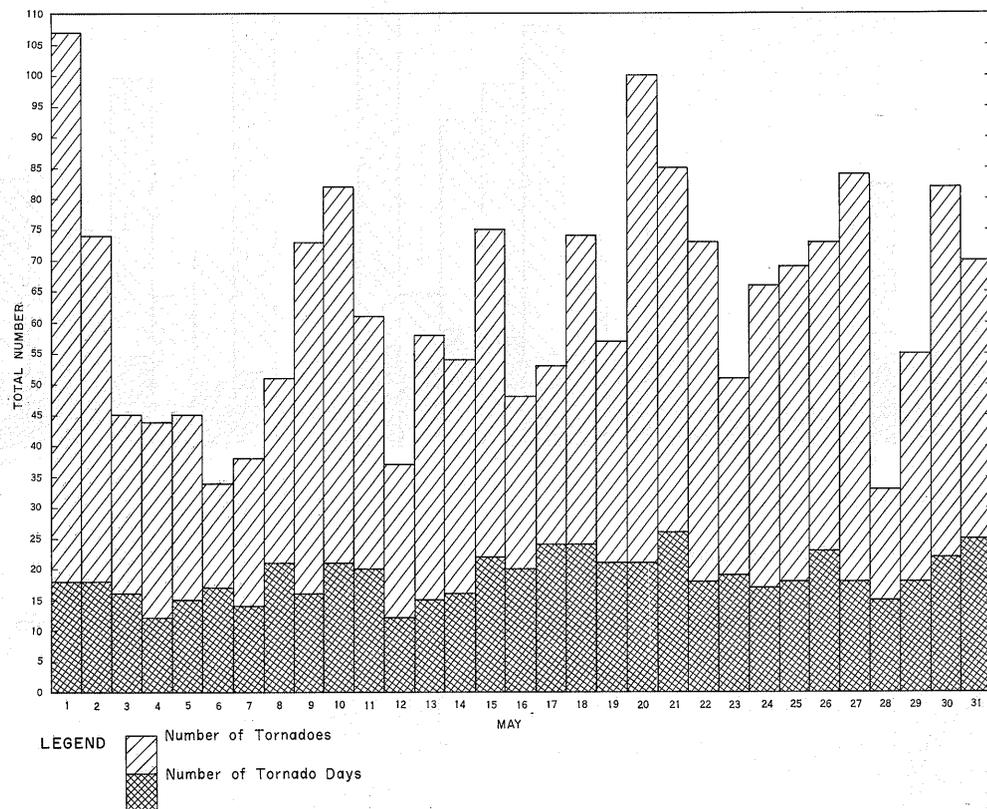
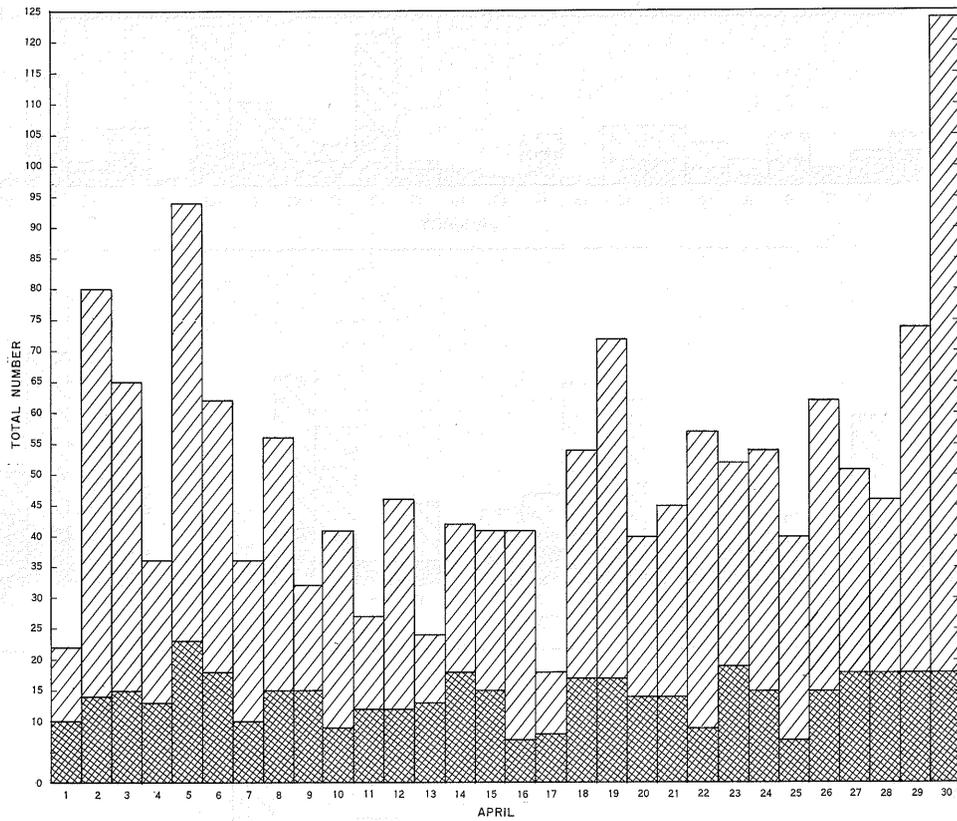


LEGEND

 Number of Tornadoes

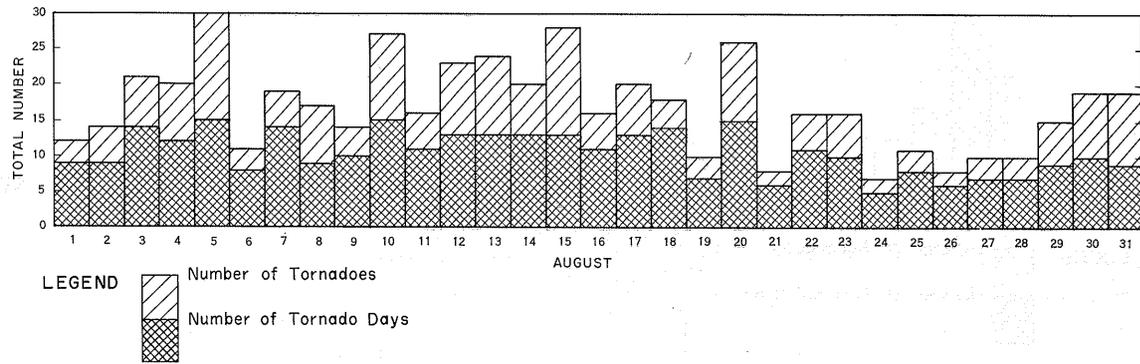
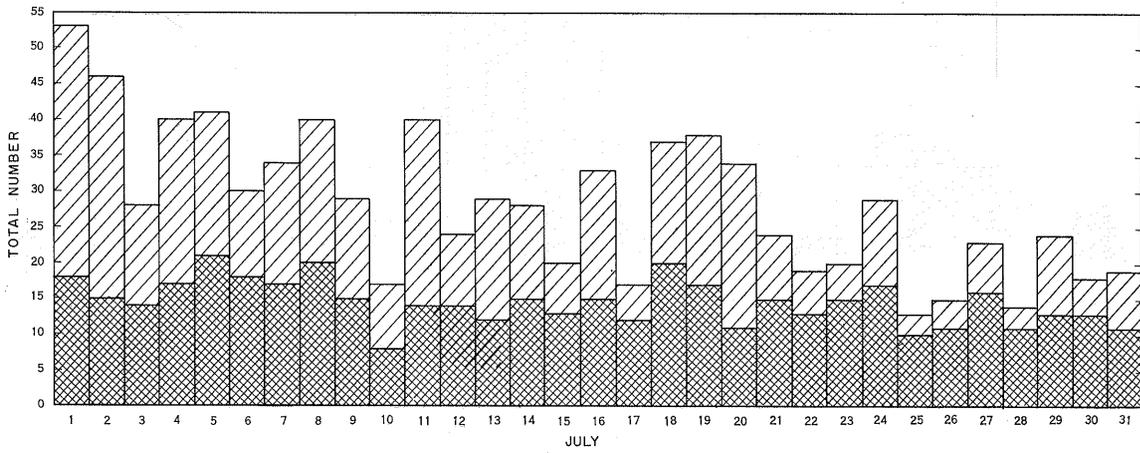
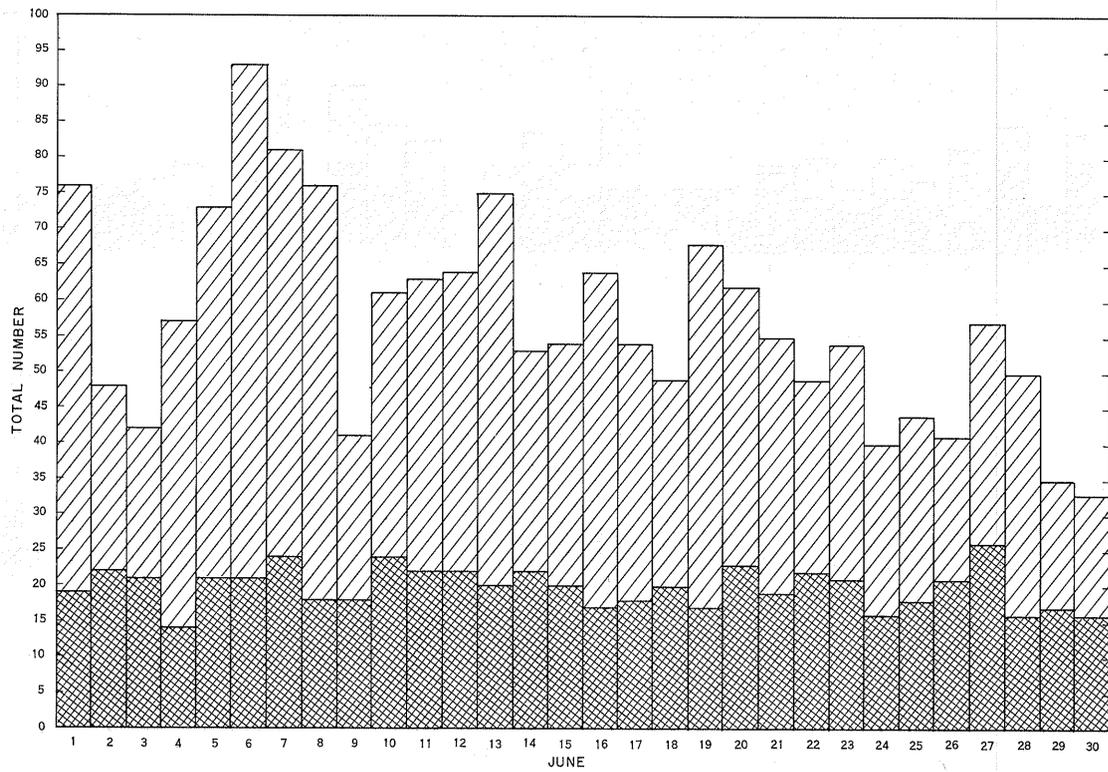
 Number of Tornado Days

Figure 10.--Total number of tornadoes and tornado days recorded on each date of the year in the United States, 1916-58.



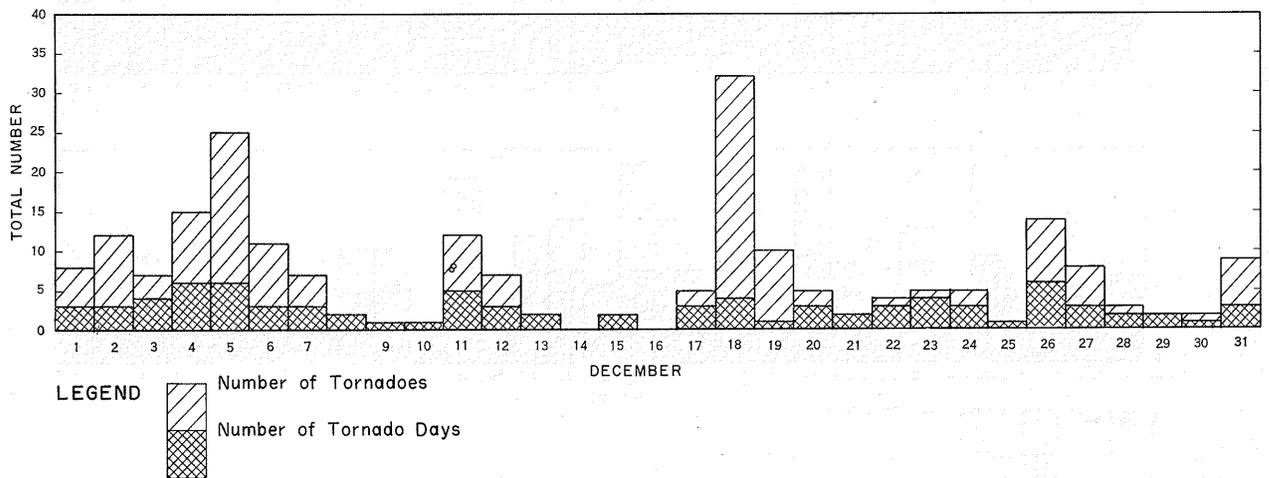
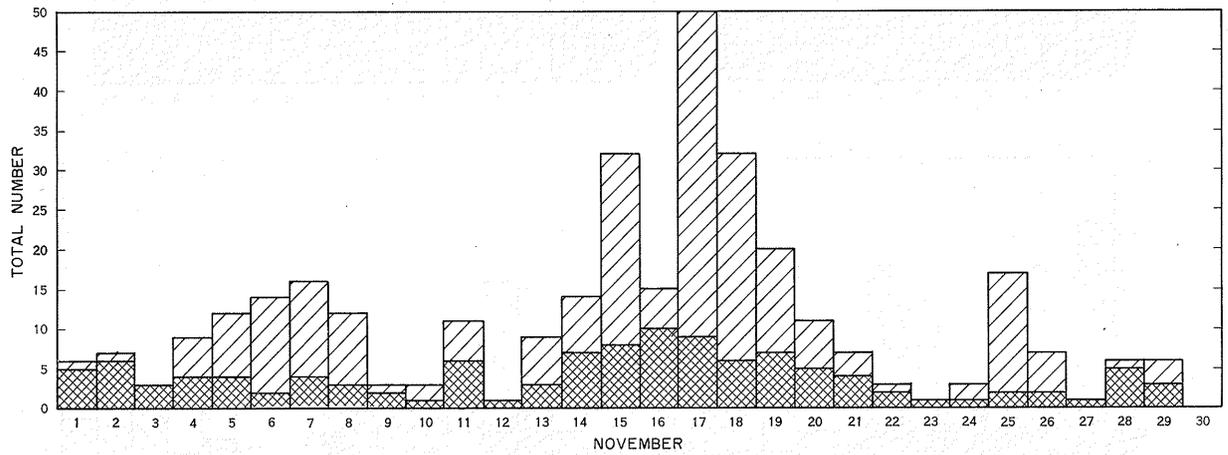
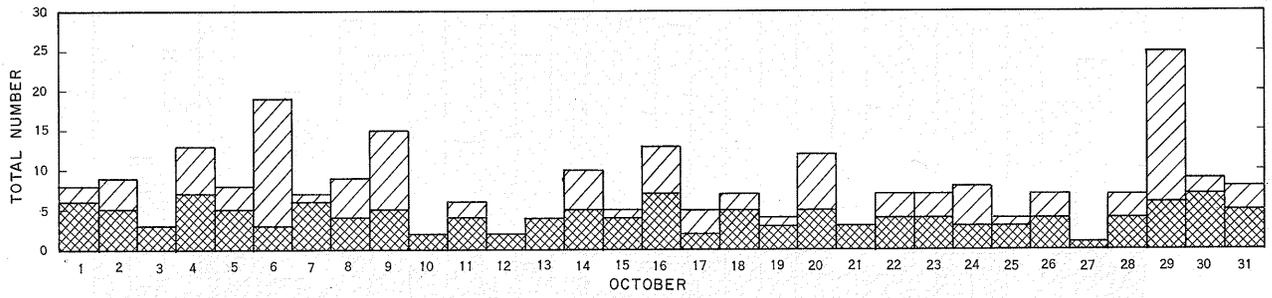
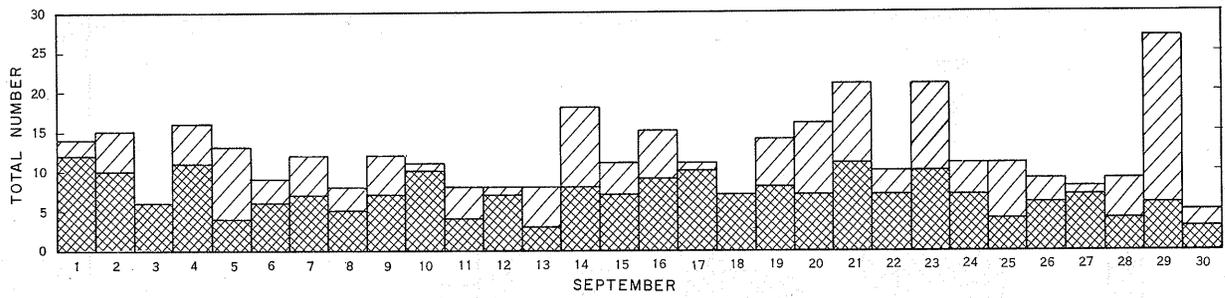
LEGEND  Number of Tornadoes
 Number of Tornado Days

Figure 10.--Total number of tornadoes and tornado days recorded on each date of the year in the United States, 1916-58. (Continued)



LEGEND Number of Tornadoes
 Number of Tornado Days

Figure 10.--Total number of tornadoes and tornado days recorded on each date of the year in the United States, 1916-58. (Continued)



LEGEND  Number of Tornadoes
 Number of Tornado Days

Figure 10.--Total number of tornadoes and tornado days recorded on each date of the year in the United States, 1916-58. (Continued)

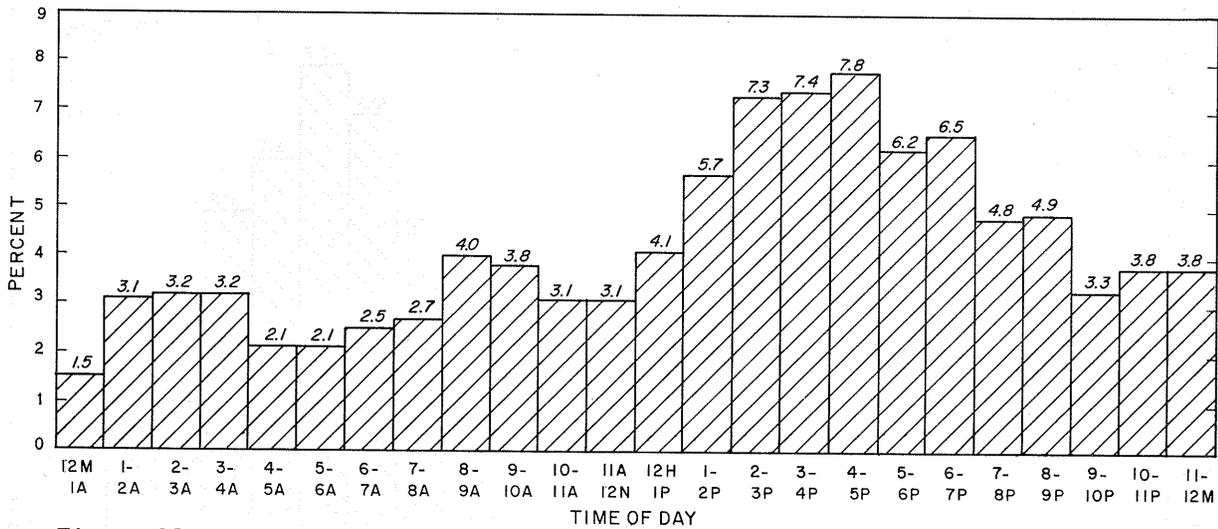


Figure 11.--Percentage of tornadoes beginning during the specified hours in the Alabama-Florida-Georgia-Louisiana-Mississippi area, 1916-58. Based on 1,312 tornadoes. Time of day not available for the remaining 117 tornadoes, or about 8 percent of the 1,429 reported in this area.

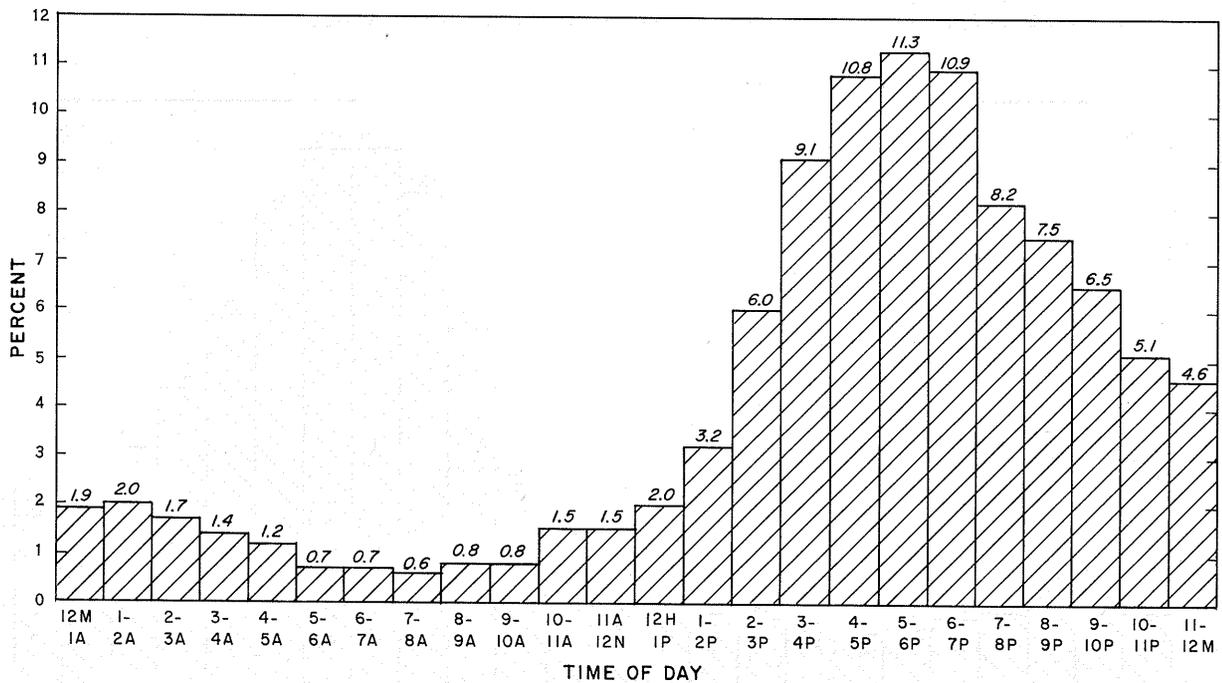


Figure 12.--Percentage of tornadoes beginning during the specified hours in the Arkansas-Kansas-Missouri-Oklahoma area, 1916-58. Based on 2,573 tornadoes. Time of day not available for the remaining 166 tornadoes, or about 6 percent of the 2,739 reported in this area.

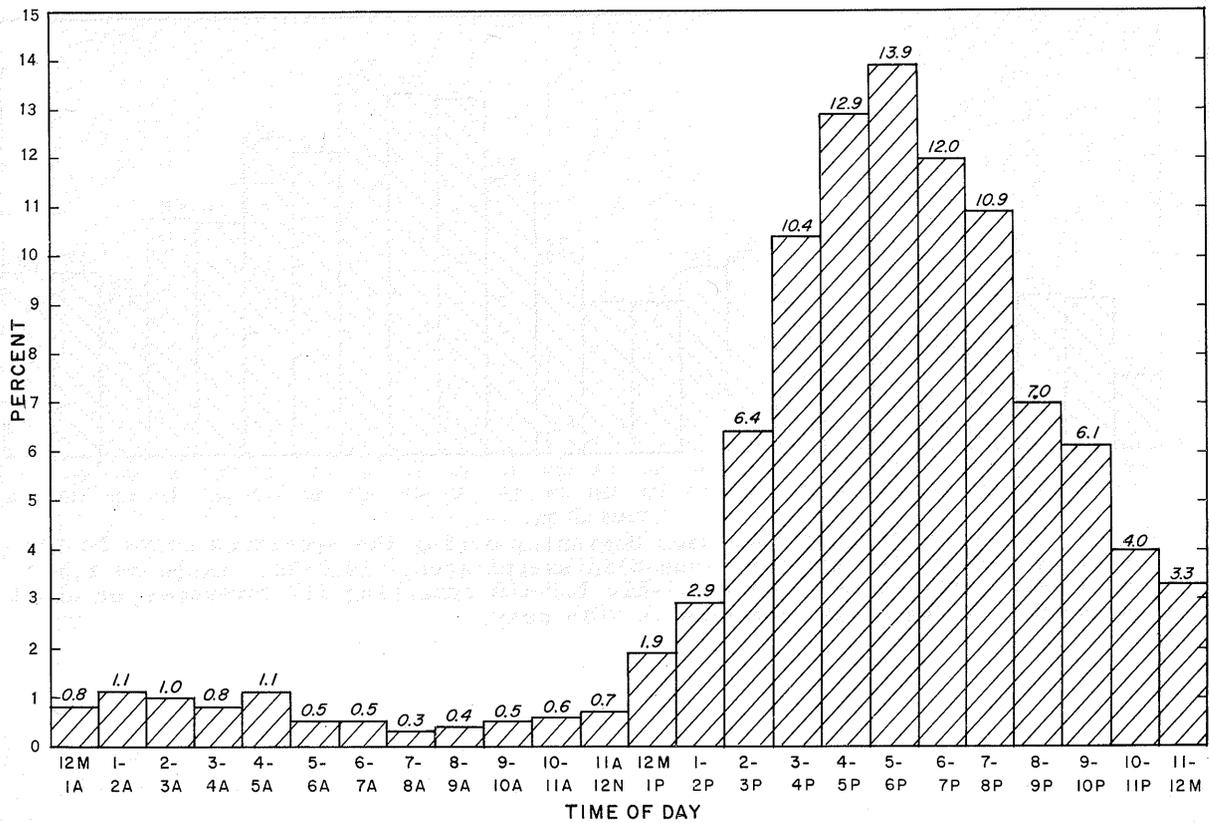


Figure 13.--Percentage of tornadoes beginning during the specified hours in the Iowa-Minnesota-Nebraska-North Dakota-South Dakota area, 1916-58. Based on 1,427 tornadoes. Time of day not available for the remaining 117 tornadoes, or about 7-1/2 percent of the 1,544 reported in this area.

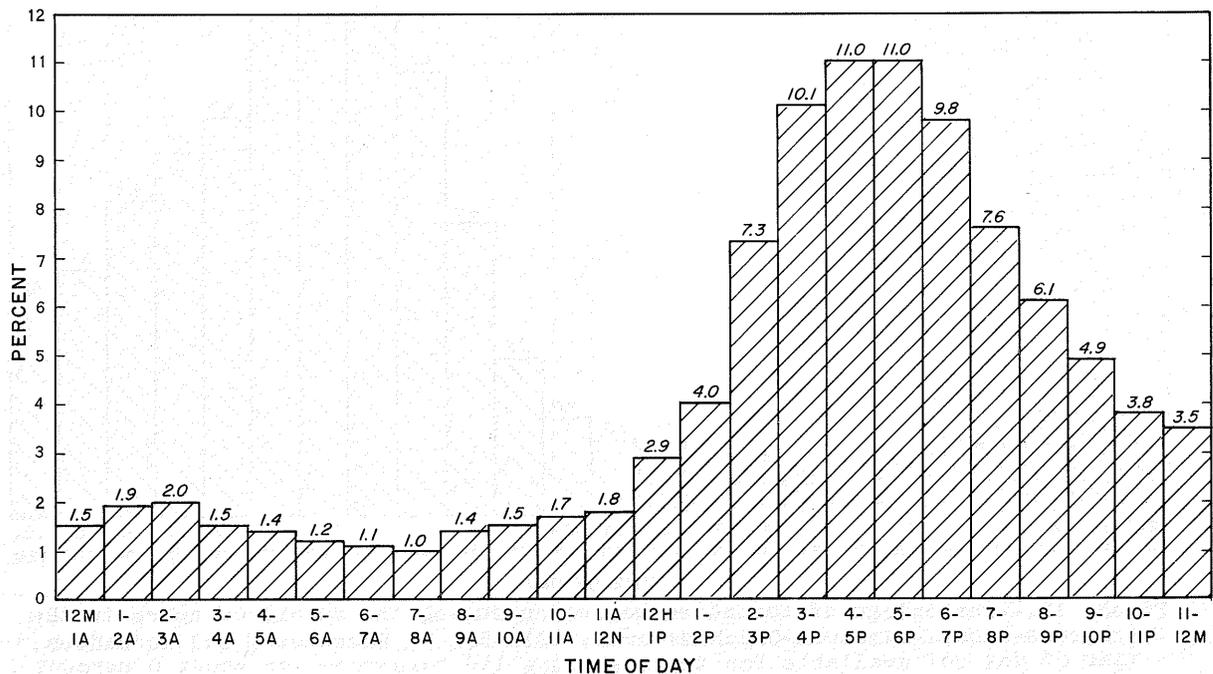


Figure 14.--Percentage of tornadoes beginning during the specified hours in the entire United States, 1916-58. Based on 8,508 tornadoes. Time of day not available for the remaining 659 tornadoes, or about 7 percent of the total number.

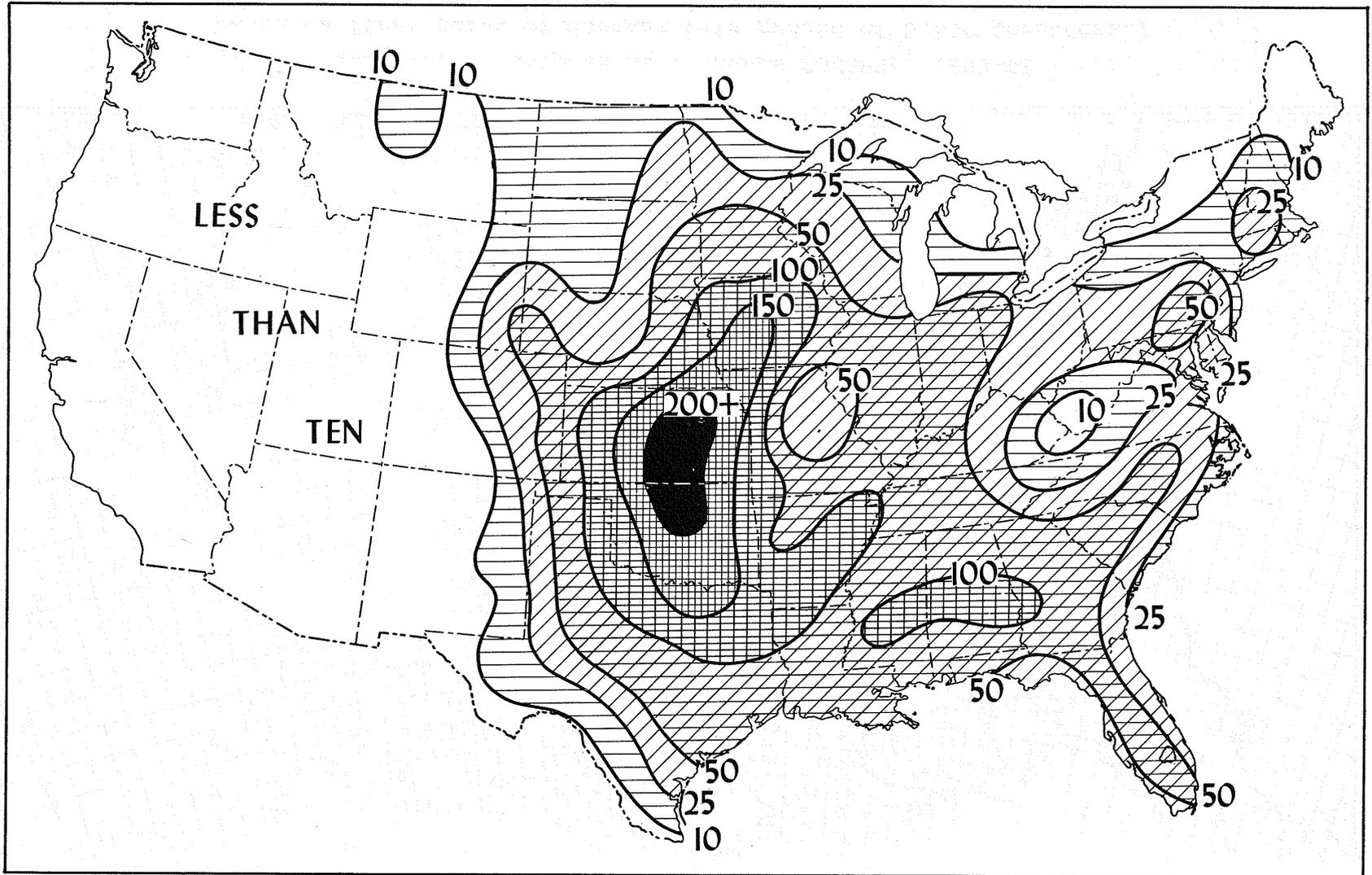


Figure 15.--TORNADOES 1916-55

(Isolines based on total number by 2° squares, counting first point of contact with ground of 7,206 tornadoes.)

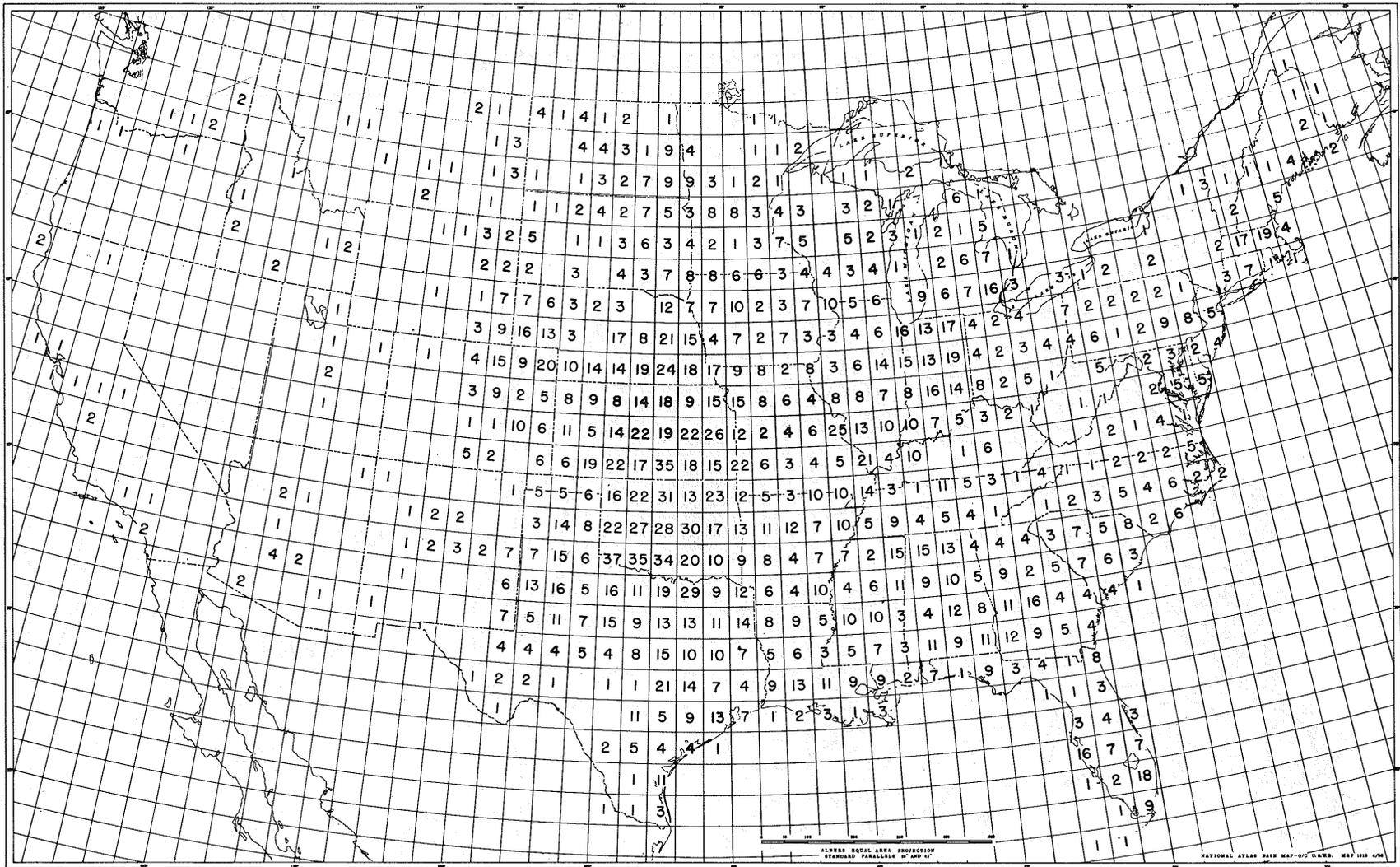


Figure 16.--TORNADOES BY 1 DEGREE SQUARES, 1953-58
(Based on first point of contact with ground of 3,540 tornadoes.)

Chart 1.-Tracks of January Tornadoes, 1916-58

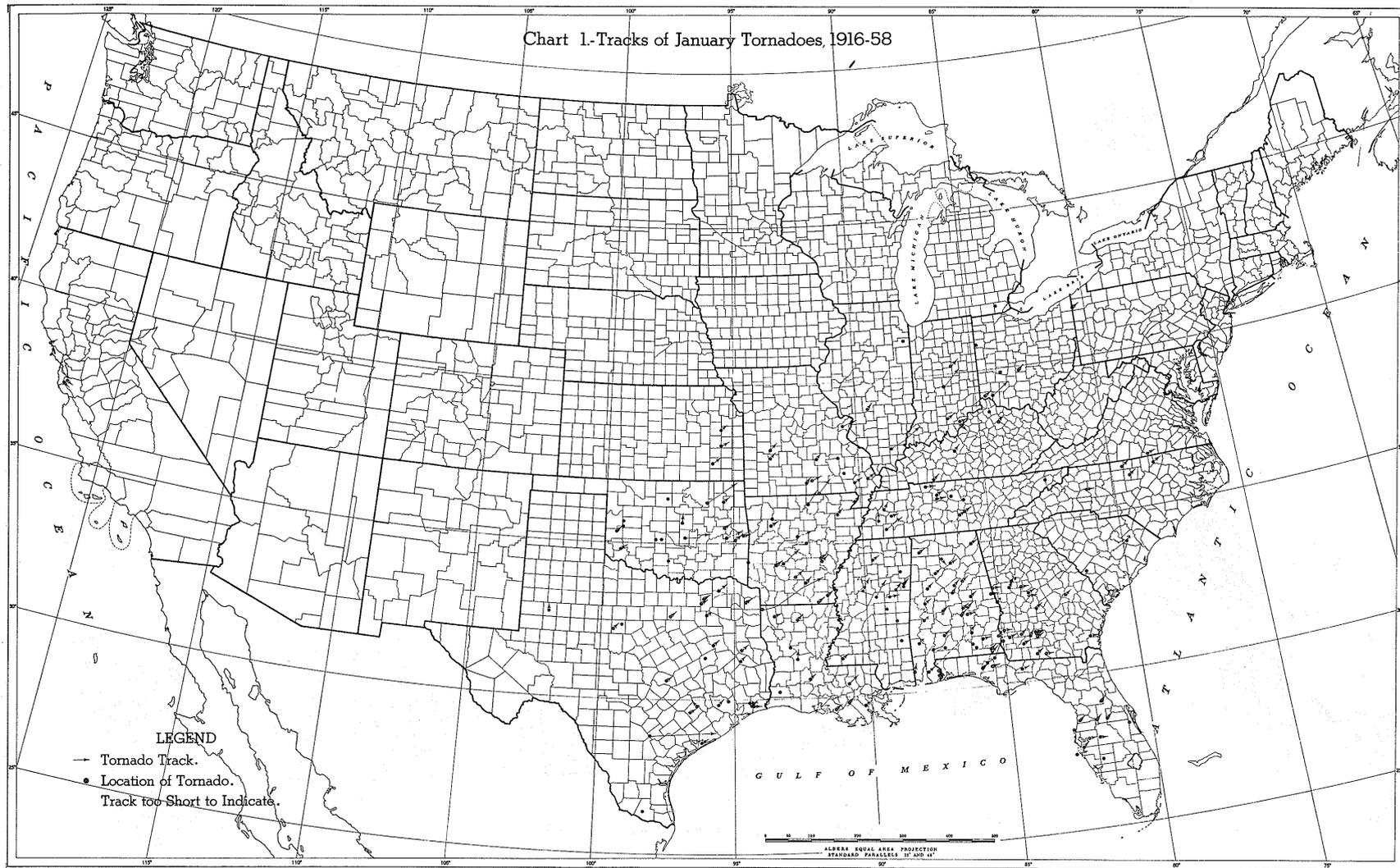


Chart 2.-Tracks of February Tornadoes, 1916-58

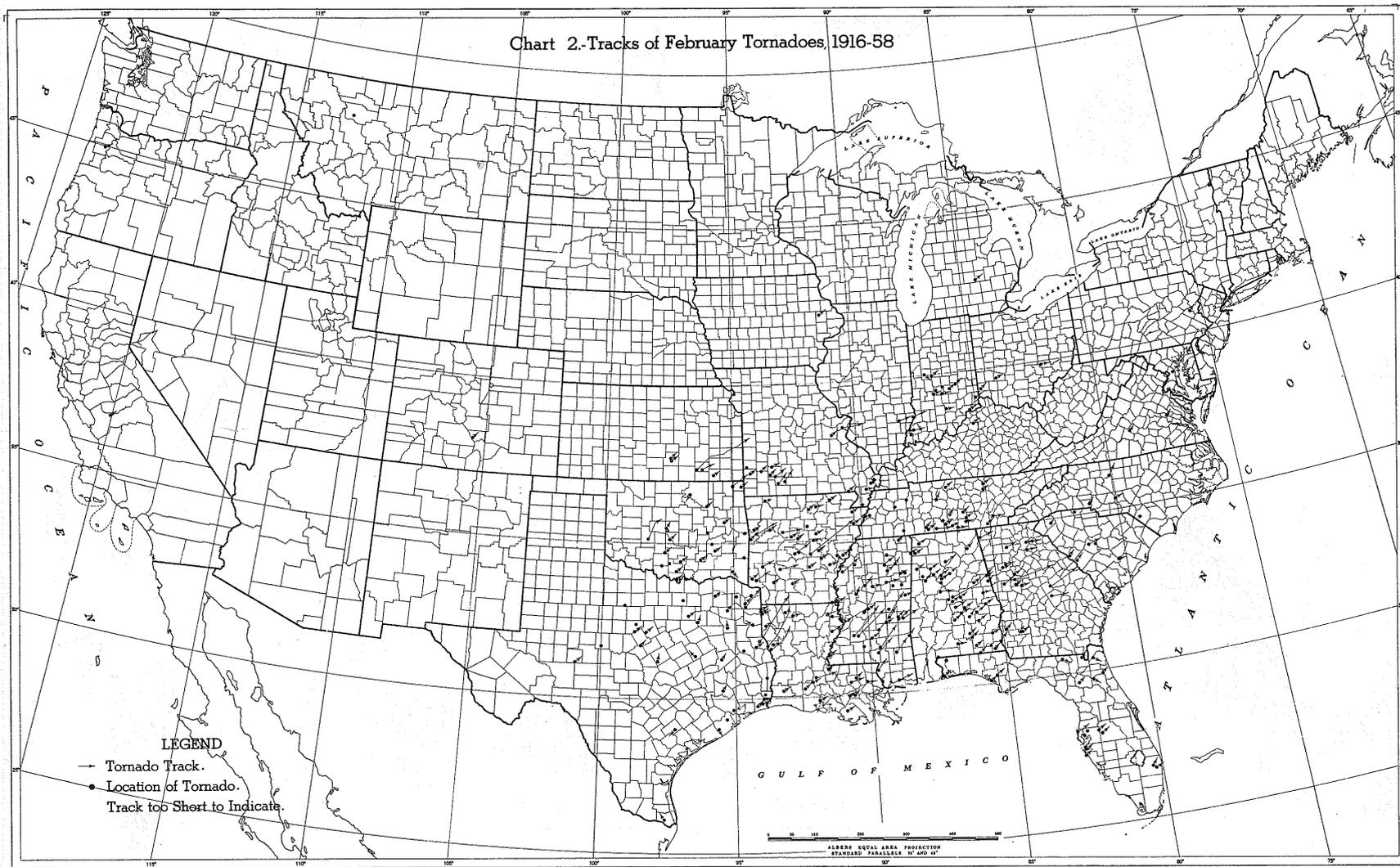
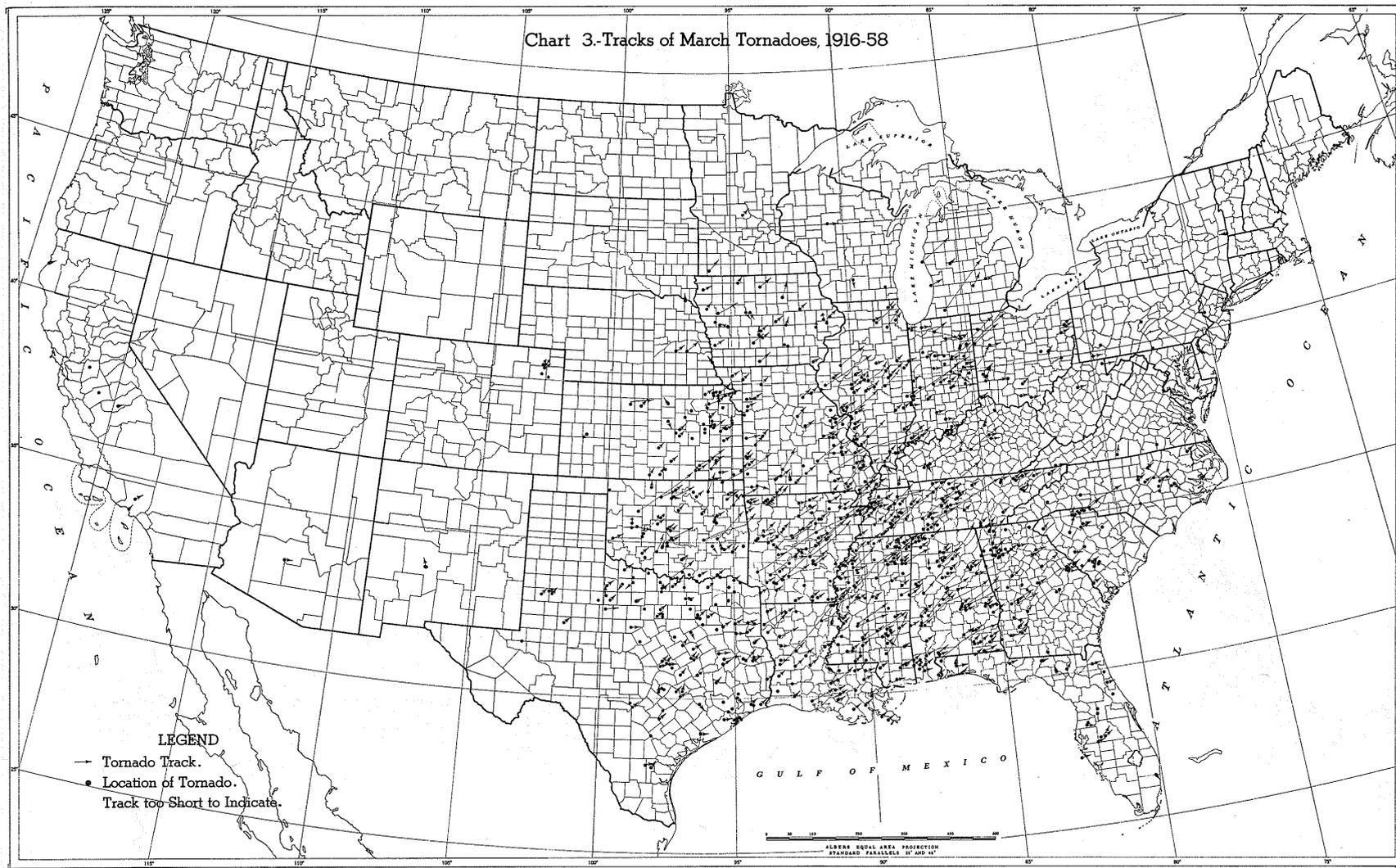


Chart 3-Tracks of March Tornadoes, 1916-58



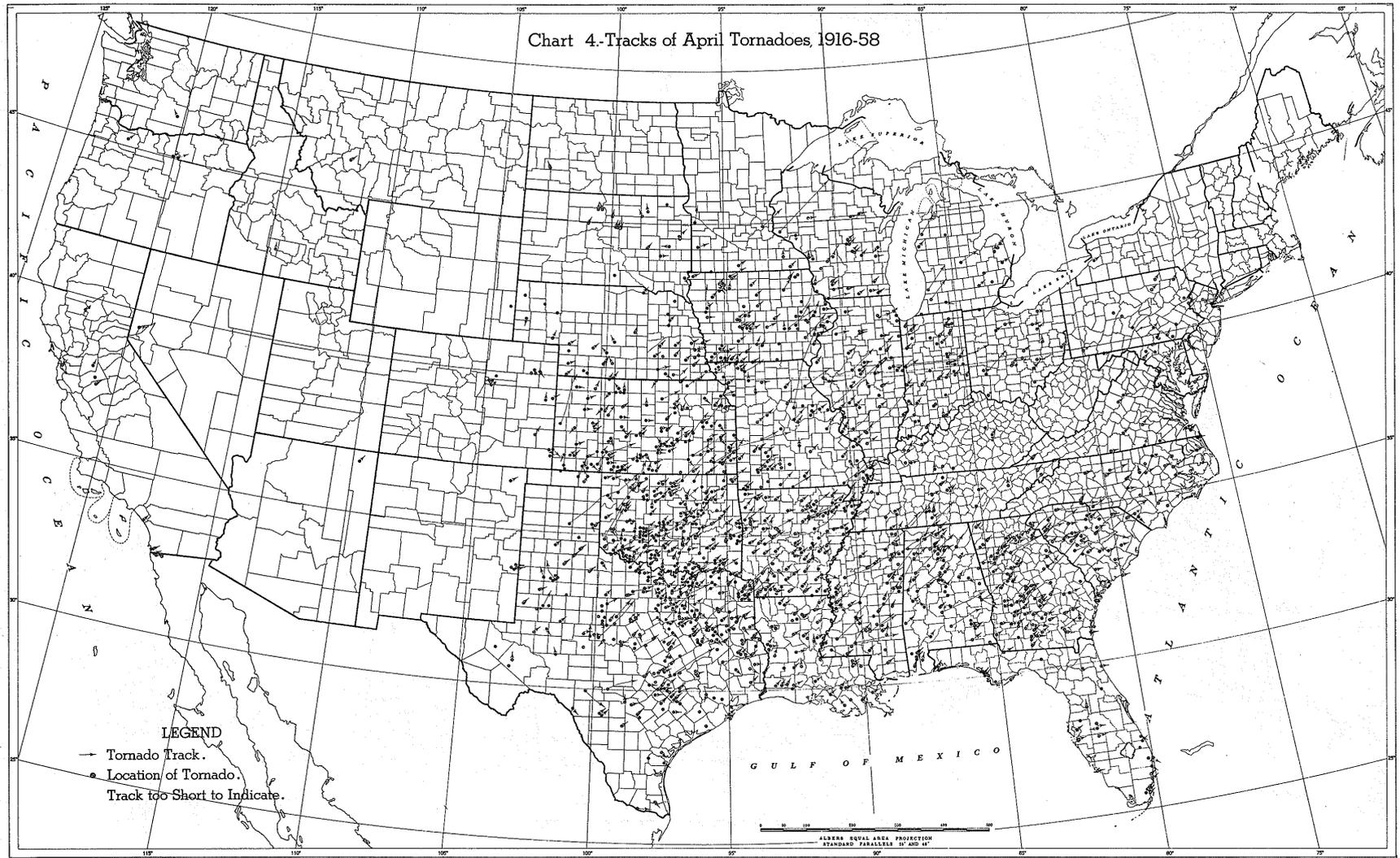


Chart 5.-Tracks of May Tornadoes, 1916-58

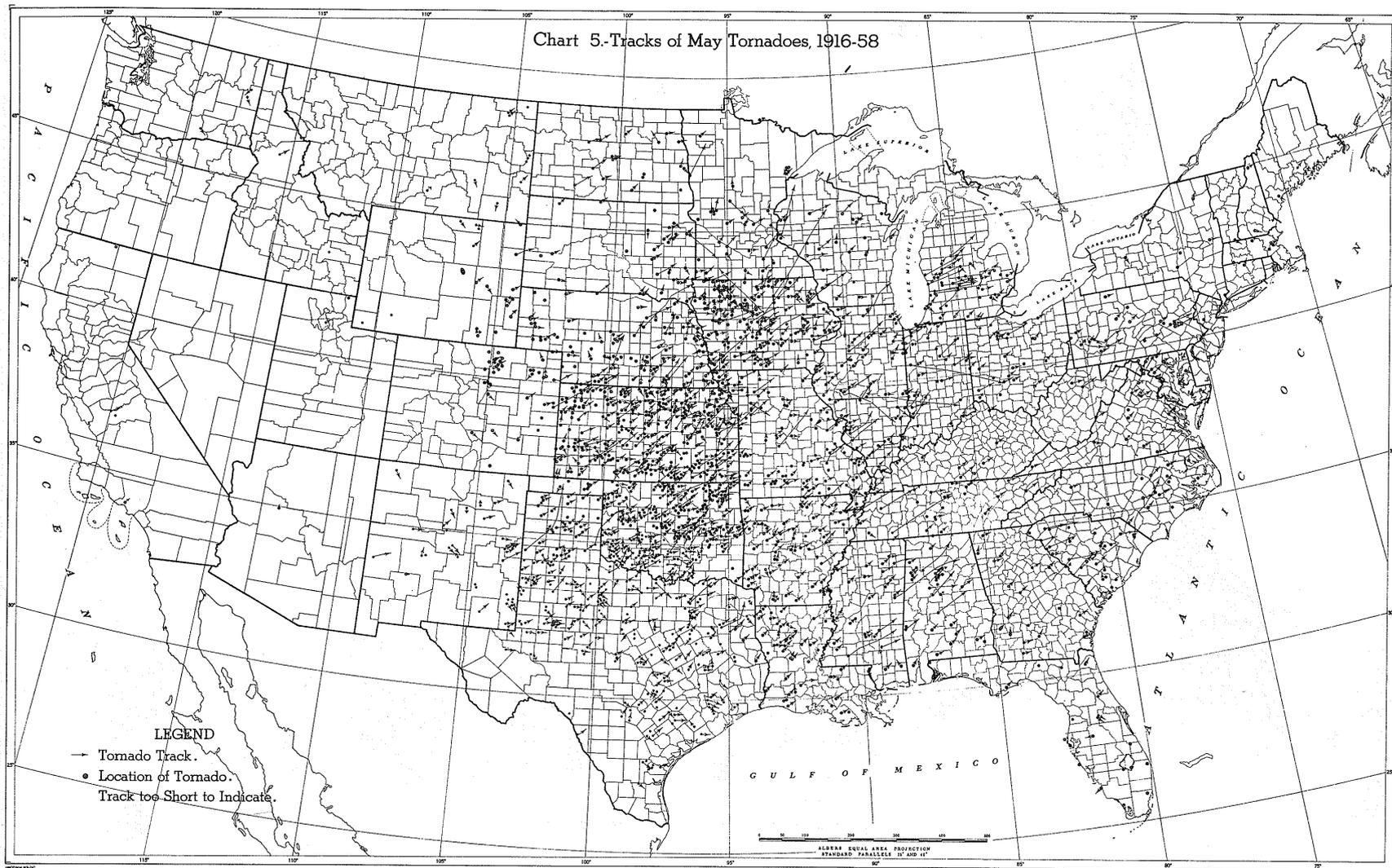


Chart 7-Tracks of July Tornadoes, 1916-58

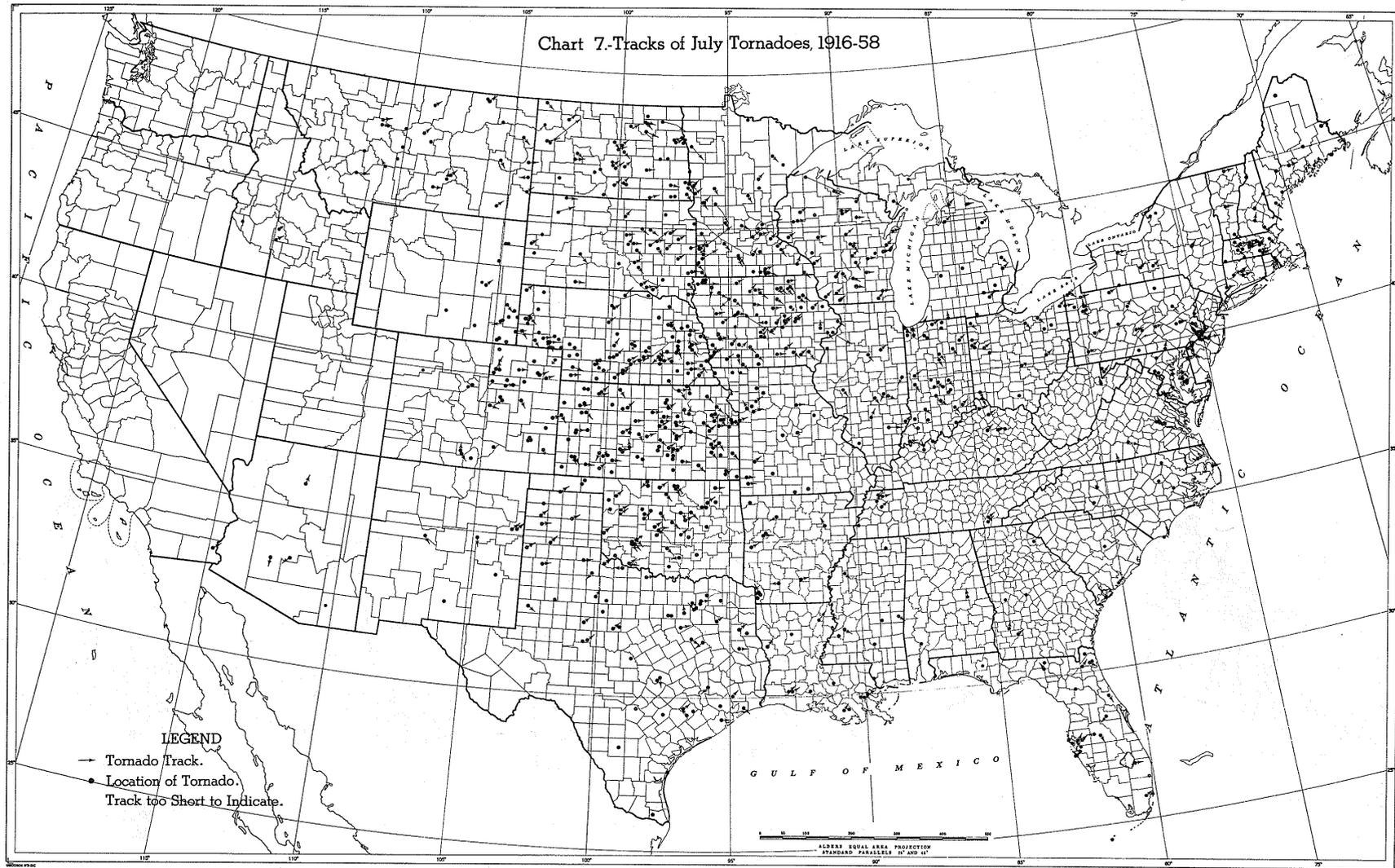


Chart 8.-Tracks of August Tornadoes, 1916-58

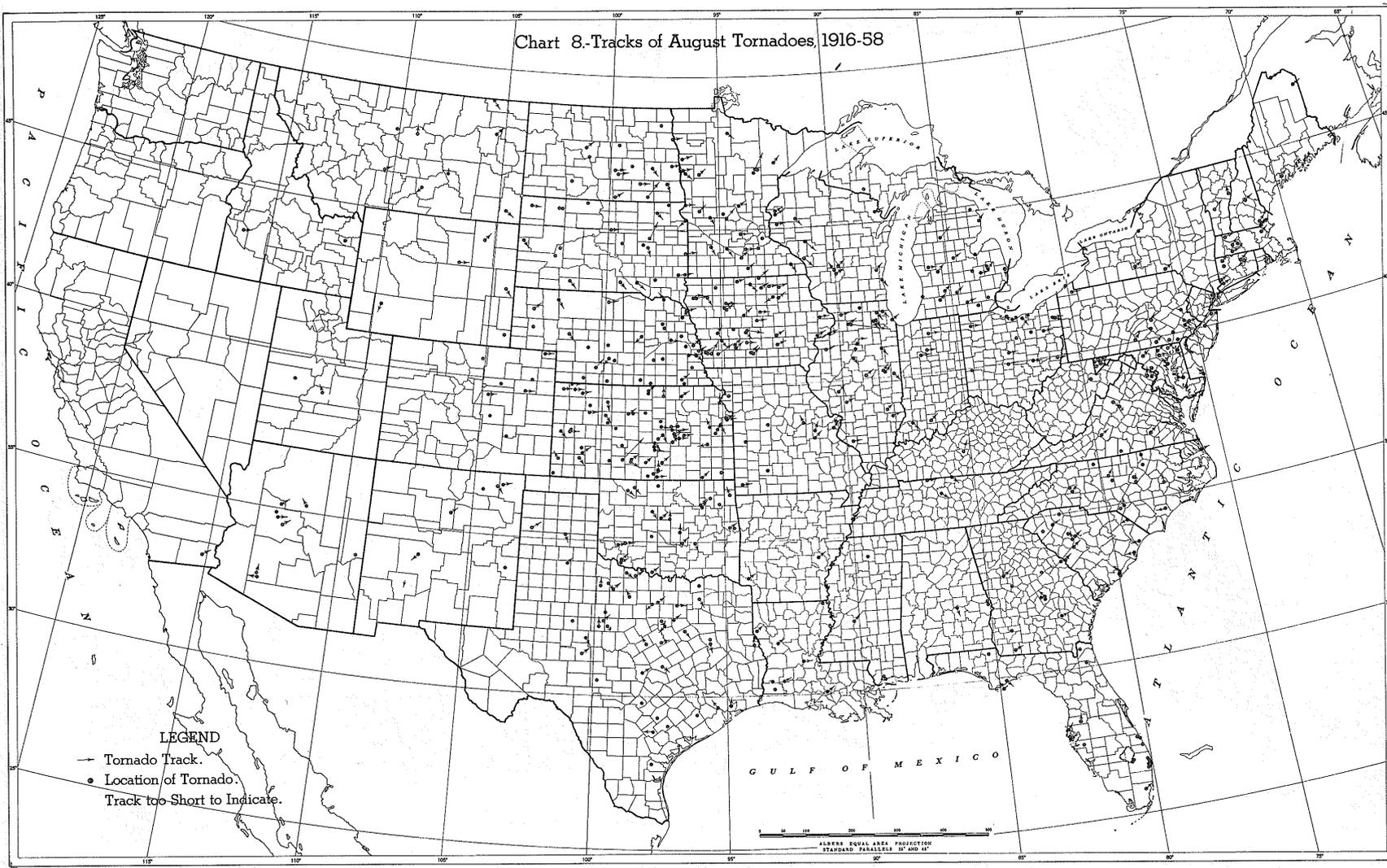


Chart 9.-Tracks of September Tornadoes 1916-58

