

County Climate Summaries for Oklahoma

The County Climate Summaries CD is a publication of the Oklahoma Climatological Survey. The CD was prepared for applications in the agricultural community. For each county, there is a 'Quick Facts' summary sheet, a detailed set of tables, and tables for selected Cooperative Observer and Oklahoma Mesonet stations within the county. The CD also contains an overview of Oklahoma's climate and links to other sources of information.

Quick Facts

Averages for temperature, precipitation and snowfall are based on Cooperative Observer data for the period 1971-2000. Stations with at least 25 years of valid observations during the period, with no station having more than 30 days missing in any year, were used in the analysis. Estimates were made at the center of each county using an objective analysis routine.

Averages for wind speed and humidity come from Oklahoma Mesonet data for 1994-2004. In counties with more than one available Mesonet station, the one nearest the center of the county was used. Sunshine information comes from the *Climatic Atlas of the United States* publication. Severe weather reports were obtained for each county from the National Climatic Data Center and the National Weather Service Forecast Office in Norman. Thunderstorm days were estimated from *Thunderstorm data: historical U.S. thunderstorm data for 1901-1995* from the Midwest Regional Climate Center.

Extremes are based on any individual Cooperative Observer observation from any period within the county. No requirements were placed on the length of record; a single observation was sufficient to determine an extreme event.

Detailed Climate Information

The narrative page contains graphs of annual precipitation and temperature for a selected station within the county. In cases where a long-term record for a Cooperative Observer station within the county was not available, a station from a nearby county was substituted. The narrative text is based off of the Quick Facts summaries, climate maps, and description of Oklahoma's ecoregions.

The climate overview table provides monthly averages and extremes based on a single, selected long-term Cooperative Observer station within the county. Similar tables for other counties can be selected using the 'select by station' option. Averages are based on all available observations for 1971-2000. Extremes are based on the station's period-of-record. Long-term stations with both temperature and precipitation observations were selected, where available. No entry in any of the columns means the event has not been observed (e.g., snowfall in July). An * indicates that an event occurs infrequently, more than an average of zero but less than one day per month.

The exceedence table is based upon the same long-term station's period-of-record observations. For each month and year, the maximum and minimum values of temperature and precipitation were recorded. These were then ranked to determine the range of highest and lowest temperatures and precipitation for each month. Because extremes can vary widely from the

central part of the distribution, the table shows the 20% and 80% of observations values, or a '2 in 10' chance that temperatures or precipitation would exceed the given values. Annual data were based upon highest and lowest temperatures and accumulated precipitation for the entire year, and then ranked accordingly.

Freeze and frost dates are based upon the long-term station's period-of-record temperatures. For each year, the last freeze in spring (for thresholds of 24, 28 and 32 degrees) and the first freeze in fall were determined. Any year with missing data between the date of last freeze and April 30 were excluded, as were years with missing data between October 1 and the determined date of first freeze. The valid years were then ranked to determine probability thresholds of occurrence (i.e, 10% = 1 year in 10; 20% = 2 years in 10; etc.). For each year with valid spring and fall freeze dates, growing season length was determined and similarly ranked.

Wind direction and speed come from 5-minute observations from a long-term (1994-2004) Mesonet site within the county. The high-resolution wind data was used to construct wind roses, showing the frequency from which the wind blows for each of 16 directions, and a frequency distribution table to show speed distributions by direction. Extremes are included in the distribution table. All wind measurements are based upon 10-meter (33 feet) observations.

Humidity and moisture measurements and soil temperatures come from the same Oklahoma Mesonet station. For stations with short-distance moves, observations from the two stations were combined if no other station was available for the county. Averages from the five-minute observations (humidity) and 15-minute observations (soil temperature) were used to determine averages. Vapor pressure deficit was calculated for each 5-minute observation and summed to determine daily values, which were then included in the averages. Only stations with 90% or more of possible observations were included in the analysis.

Significant tornadoes are those categorized as F2 or greater on the Fujita scale (ranging from F0 to F5). These are typically the most destructive and deadly tornadoes. Tornado event archives from *Significant Tornadoes 1880-1989* and the National Weather Service Forecast Office in Norman were used to construct a historical listing for each county. All counties affected by the tornado are listed. Deaths and injuries are over the total path length of the tornado and did not necessarily occur within the specified county.

Station Summaries

For each long-term Cooperative Observer site and Mesonet site, station summaries were produced to give more localized information than the county representation. These station summaries contain tables similar to those found in the detailed county documents. Because more stations were included, some may not have sufficient data to calculate 1971-2000 means for every month. Months with an insufficient record are listed as "NA" for Not Available. In addition, some of the Cooperative Observer stations record only precipitation, so the temperature fields will all be listed as NA. As with the other tables, * indicates the occurrence of an event but less than one day per month average.