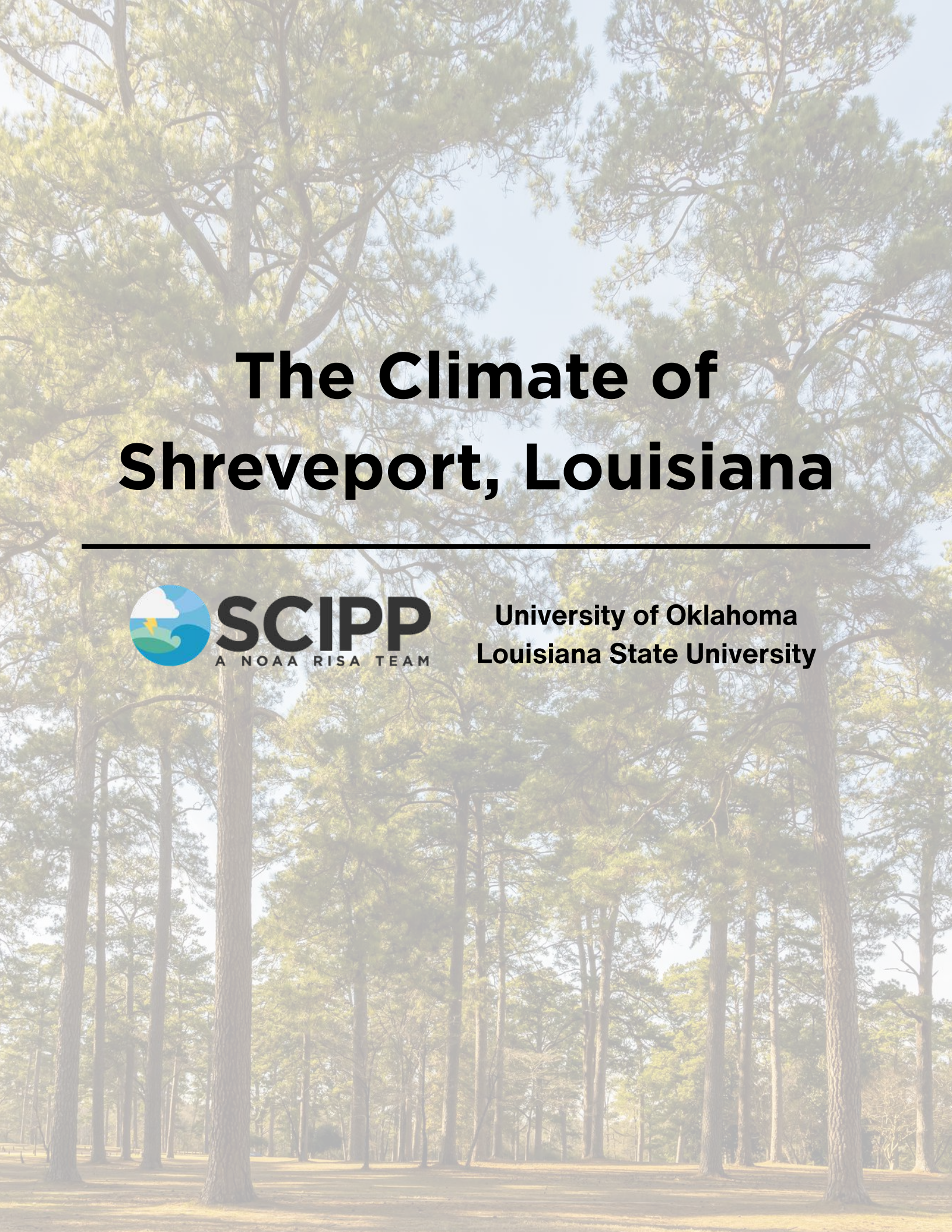

# The Climate of Shreveport, Louisiana

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Louisiana State University

# The Climate of Shreveport, Louisiana

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## Climate Overview

*The goal of this report is to provide a concise summary of the climate and extreme weather events that affect the City of Shreveport. This information could be used to help inform planning and preparedness for extreme weather events now and in the future.*

## Overview

The City of Shreveport is nestled within the South Central Plains ecoregion. The region is a mix of pine and hardwood forests, interspersed with cropland, primarily along the Red River floodplain. To the east lies more heavily wooded areas and to the west the land opens up into prairies. Lumber, pulpwood, and oil and gas production are major economic activities in the region.

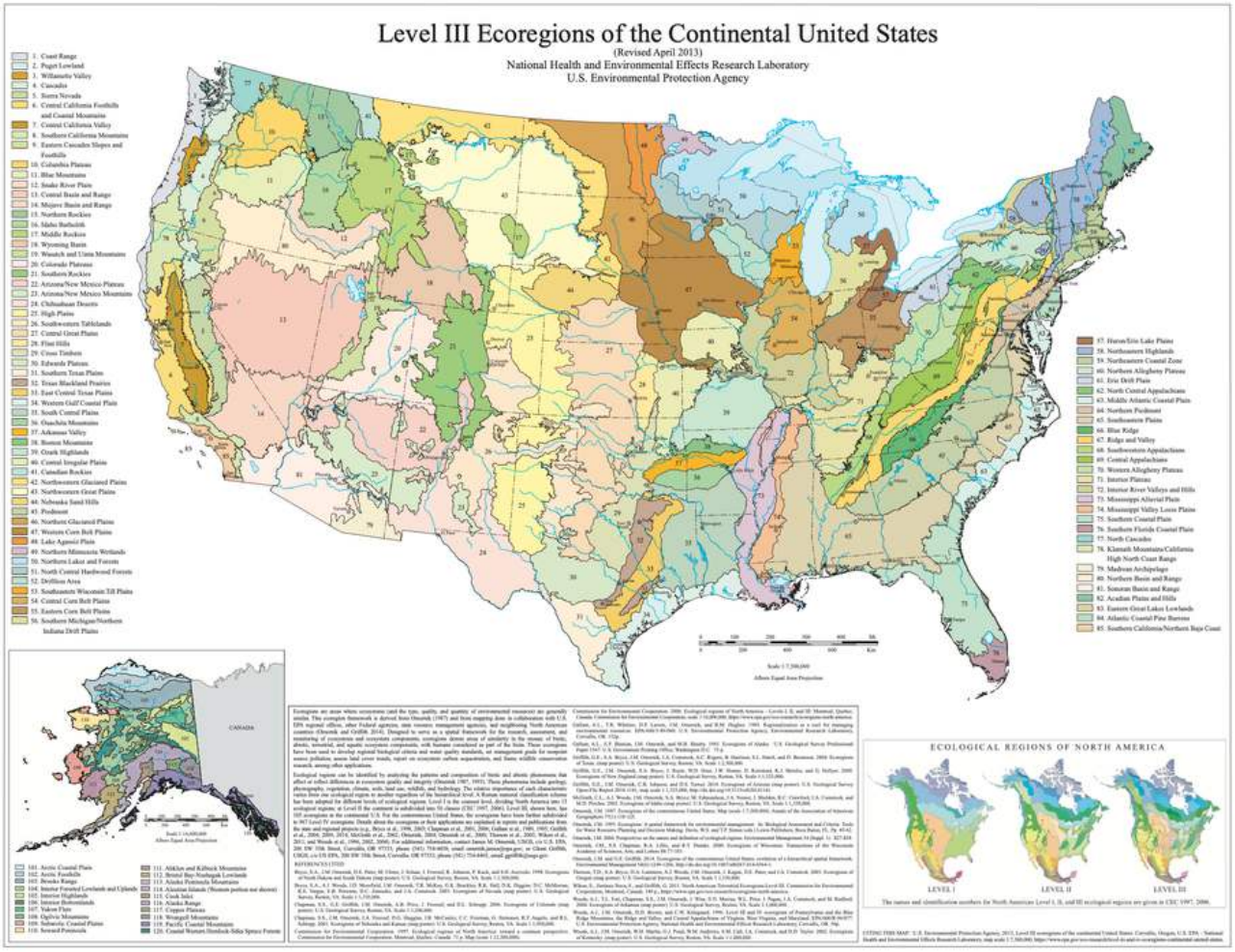


**Figure 1:** United States Level III Ecoregions, denoting areas of similar vegetation and ecology.[1]

[1] Source: EPA https://www.epa.gov/eco-research/level-iii-and-iv-ecoregions-continental-united-states

Shreveport lies along the Red River, which flows southward from Arkansas, making a southeastward turn near Shreveport, until it eventually joins the Mississippi and Atchafalaya Rivers. The city has several oxbow lakes in the Red River floodplain and several small bayous. Cross Lake, the primary water supply for the city, is located in the northwest part of the City. The general climate of the region is characterized by long and hot summers and cool to mild winters. The air is humid subtropical, meaning rainfall is frequent and the air is usually moist. Thunderstorms occur frequently through the spring, summer, and fall. The area is occasionally affected by tropical storm remnants traversing northward from the Gulf of Mexico, bringing heavy rainfall and posing flooding risks.

**Temperature**

The average annual temperature in Shreveport is 67.5 degrees, with an average high temperature near 78 degrees and an average low of 57 degrees. July and August are the hottest months with average daytime maximum temperatures peaking at 96 degrees in early August. January is the coldest month with average maximum temperatures of 58 degrees and nighttime lows dipping to 37 degrees.

Temperatures over 100 degrees in summer are not uncommon, with an average of 11 days of 100 degrees or higher each summer. About 2 in 10 years record a temperature as high as 105 degrees. Likewise, temperatures can fall well below freezing, with 2 in 10 years recording a low of 12 degrees. On average, the temperature dips below freezing on 30 days each year. The highest temperature recorded in Shreveport was 110 degrees on August 25 and August 26, 2023; the lowest temperature was 1 degree on February 16, 2021.

Shreveport averages a growing season of 259 days, but plants that can withstand short periods of lower temperatures may have an additional four weeks added to their growing season.

Annual average temperatures can be variable, with temperatures as much as 4 degrees above or below the long-term (1895-2024) average. Although there is large inter-annual variability, the climate record shows extended periods of relatively warmer or colder weather. Since the late 1990s, temperatures have generally been running above the long-term average. Preceding this, however, is nearly four decades of below-average temperatures, although individual years during warm periods can still end below average and during cold periods can be above average. The hottest year on record in northwestern Louisiana was 2023 and the coldest year on record was 1983.

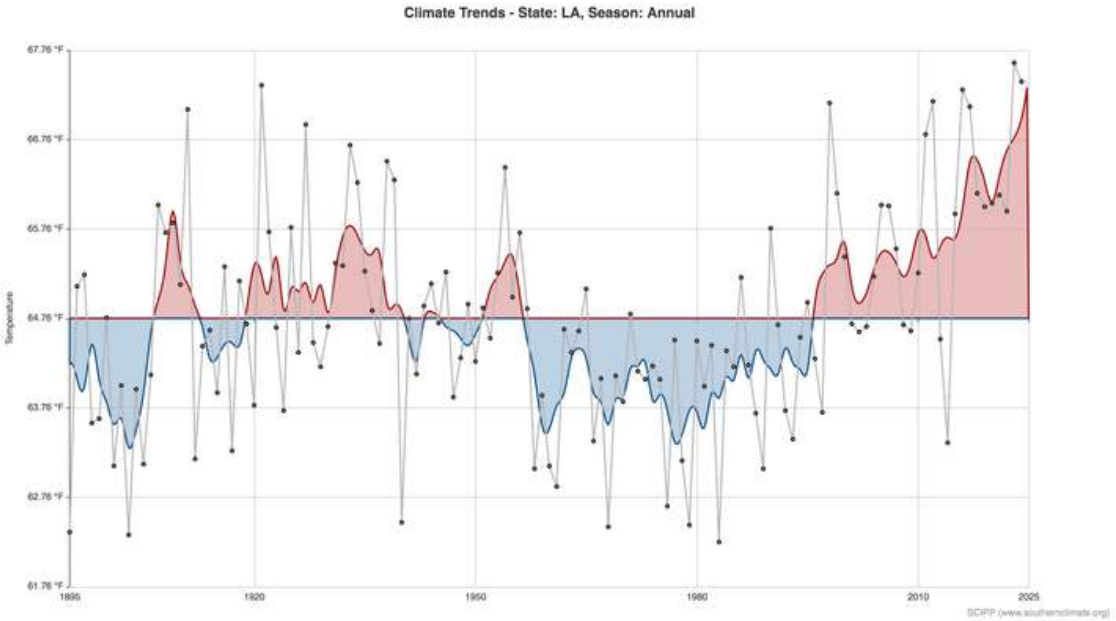


**Figure 2:** Five-year weighted mean temperatures for northwest Louisiana. Red indicates above the long-term average; blue indicates below-average. Yearly average temperatures are shown by the black dots.[2]

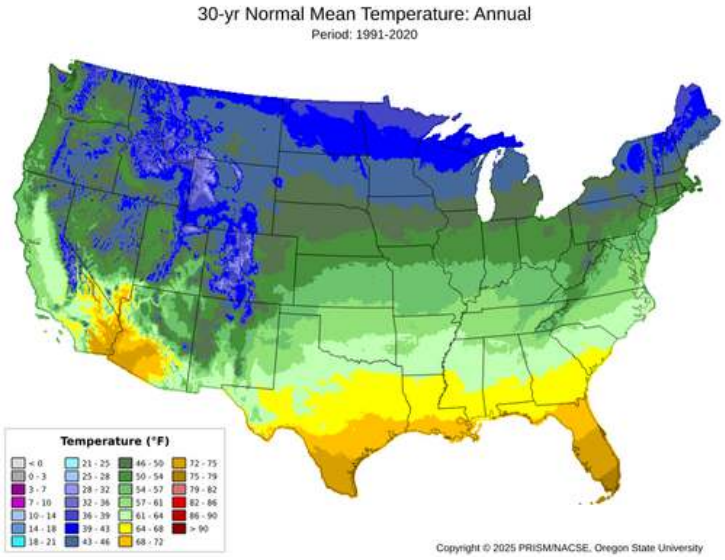


**Figure 3:** Mean annual temperature.[3]

## Precipitation

Annual average precipitation (combined rainfall and liquid equivalent of snowfall) is 48.87 inches. Most years average between 38 and 60 inches of precipitation. There has been an upward trend in annual rainfall accumulation, adding about 6 inches since 1960. There has been no observable trend in the number of days on which it rains.

June and December are the wettest months with an average of more than five inches each, but the area generally receives abundant rainfall year-round, with summers a bit drier than other seasons. Measurable rain occurs on average 99 days per year, with 17 days on average experiencing more than one inch of precipitation. The greatest daily rainfall was 10.44 inches recorded on April 12, 1991. That contributed to the single-month record of 21.84 inches in April 1991. That year ended with a record 81.99 inches of rainfall.

[2] Source: Southern Climate Impacts Planning Program, https://charts.climate.lsu.edu/trends/

[3] Source: PRISM, https://prism.oregonstate.edu/normals/

Snowfall is rare in Shreveport. Snowfall is recorded about half the years in the available record. Snowfall of one inch or more is even more rare, occurring only 11 times during the 30-year average period of 1991-2020, although there were three such events the following year (2021). The overall average is 1.6 inches per year, but this is driven by only a handful of events. The greatest seasonal total was 14.0 inches in 1948, followed by 9.5 inches recorded during the winter of 2021. The greatest single-day snowfall was 7.9 inches on January 19, 1948. Snowfall of 3 inches or greater has only been recorded on 16 days since 1948.

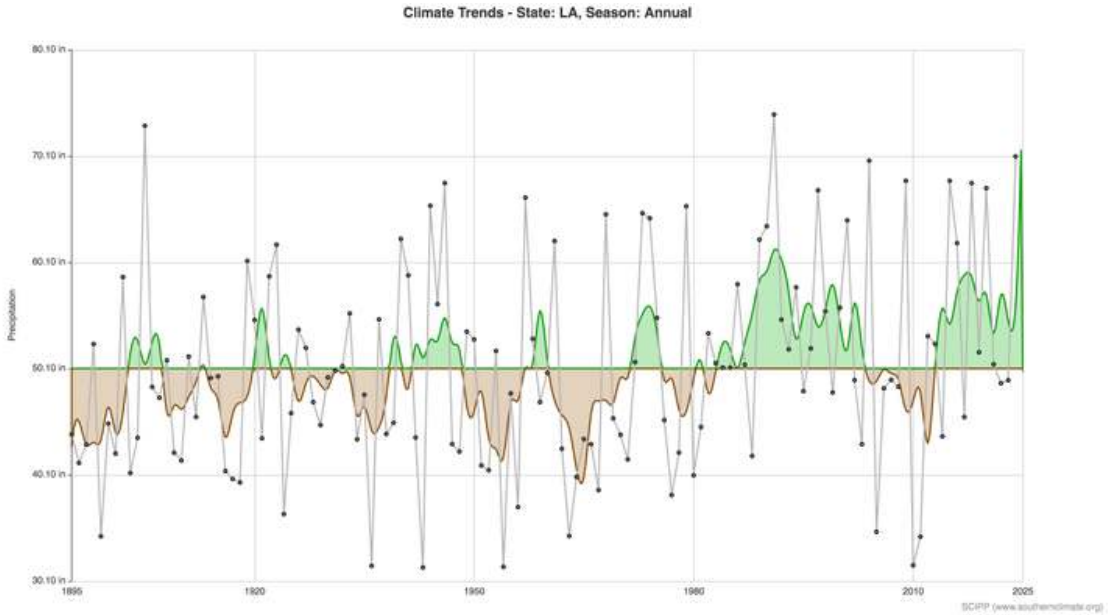


**Figure 4:** Five-year weighted mean precipitation for northwest Louisiana. Green indicates above the long-term average; brown indicates below-average. Yearly average precipitation totals are shown by the black dots.[4]

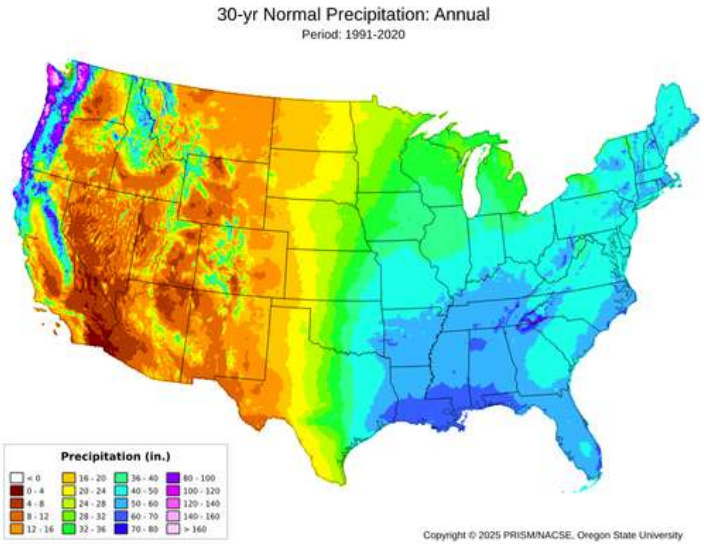


**Figure 5:** Mean annual precipitation.[5]

## Other Variables

Western Louisiana northward into Arkansas is among the least-windy regions of the country. Annual wind speed averages 7.4 miles per hour, with about 15% of the time having calm winds. Wind direction is predominantly from the south, although the strongest winds often occur from the northwest.

[4] Source: Southern Climate Impacts Planning Program, https://charts.climate.lsu.edu/trends/

[5] Source: PRISM, https://prism.oregonstate.edu/normals/

In winter, winds from the north or northwest are about as common as those from the south or southeast but in summer winds from a direction other than south or southeast are rare.[6]

Shreveport generally has more cloud cover than much of the rest of the country, but does receive more sunshine than the rest of Louisiana. Winter has more clear days than in summer, with an annual average of 66% of possible sunshine reaching the surface. Although Shreveport is well inland from the Gulf of Mexico, the warm waters to the south provides abundant moisture, making relative humidity high at 70% on average, with an average annual dewpoint of 53 degrees (ranging from 38 in winter to 72 in summer). This contributes to higher heat indices, along with abundant rainfall.

## Extreme Weather Events

Like most of Louisiana, Shreveport is subject to a range of extreme weather events. It is located far enough north to get cold fronts in the fall, winter, and spring, and close enough to the Gulf of Mexico to have a plentiful supply of moisture to fuel storms. This combination produces severe storms, tornadoes, heavy rainfall associated with flooding, and winter storms. The city is also subject to occasional tropical storm remnants that can bring heavy rainfall and strong winds. When the Gulf moisture cannot make it far enough north, Shreveport may experience drought, heat waves, and wildfires.

### *Tornadoes*

Shreveport sits on the edge of "Tornado Alley" to the west and "Dixie Alley" to the east. On average, Shreveport experiences a tornado about one day per year (a tornado occurring within 25 miles of Shreveport). From 1950-2024, 103 tornadoes were reported in Caddo Parish and 168 tornadoes occurred at least partially within 25 miles of downtown Shreveport.

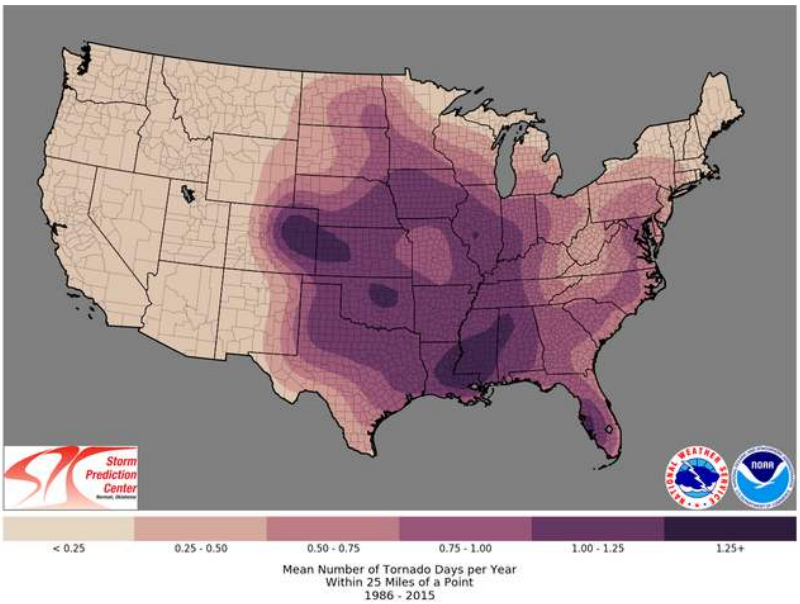


**Figure 6:** Mean annual number of days with a tornado within 25 miles of a point.[7]

[6] Source: Iowa Environmental Mesonet, https://mesonet.agron.iastate.edu/sites/windrose.phtml?network=LA_ASOS&station=SHV

[7] Source: National Weather Service Storm Prediction Center, https://www.spc.noaa.gov/wcm/

Significant tornadoes (EF2 or greater on a scale from EF0 to EF5) are rarer, occurring on average once every two years. Fifty of the 168 tornadoes were considered significant. Only three “violent” tornadoes (EF4 or EF5) were reported in Caddo Parish since 1950. However, the violent tornadoes accounted for 27 of the 38 total fatalities attributed to all tornadoes in the sample. Most tornadoes occurred in April or May and primarily between 6:00-7:00 p.m.[8]

The most significant tornado to affect Shreveport, and neighboring Bossier City, occurred on April 3, 1999. The tornado cut a path 19.3 miles long and 200 yards wide, beginning on the north shore of Cross Lake and moving northeastward. If the tornado track had been a few miles further south, it would have placed it right through the heart of the City. Fortunately, the area was not as densely populated, so only 12 injuries and no fatalities resulted in Caddo Parish, although there were 7 fatalities in Bossier Parish. The storm caused $1.26M in damages in Caddo Parish and $6.68M damages in Bossier Parish.

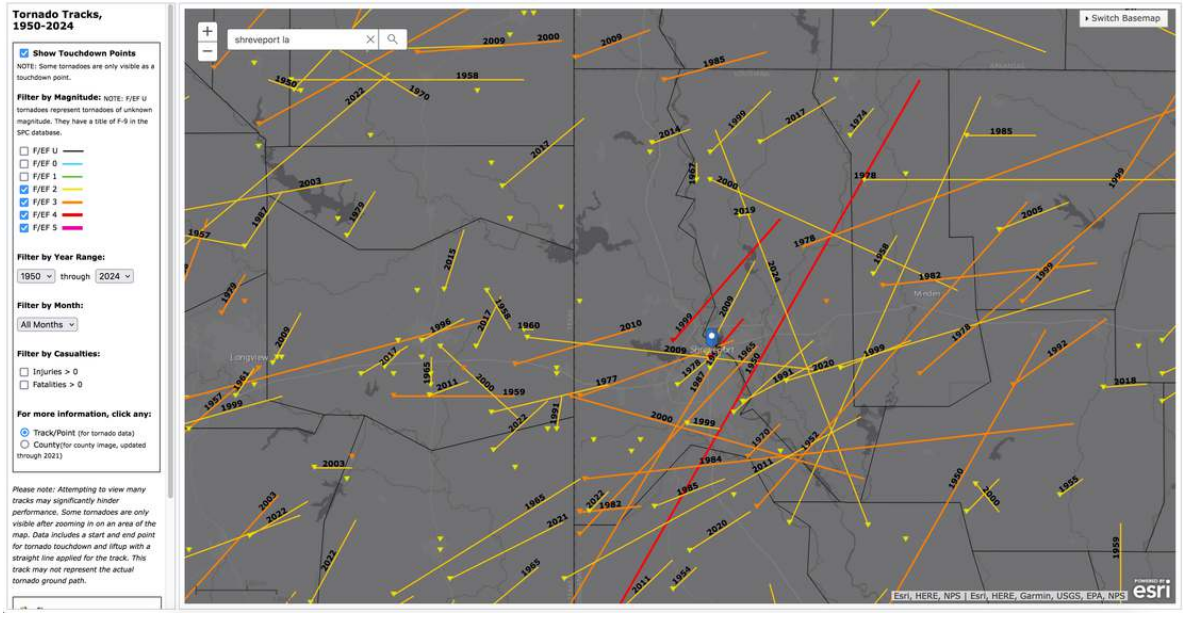


**Figure 7:** Significant tornadoes (F2/EF2 or stronger) affecting Caddo Parish 1950-2024.[9]

There does not appear evidence to support a “Barksdale Bubble” in tornado or other storm data. Significant tornadoes actually appear to be more frequent south of I-20, contrary to some local perceptions. Hail and wind reports (discussed later) shows even coverage across all of Caddo Parish. Because impacts from thunderstorms can vary neighborhood-by-neighborhood, most places have a perception of storms missing them. But probabilistically, sooner or later nearly every location will be affected, with the time interval being shorter for places that have more frequent storms.

[8] Source: NWS Storm Prediction Center, https://www.spc.noaa.gov/wcm/, https://www.spc.noaa.gov/climo/online/probs/?lat=32.513&lon=-93.752&rad=40

[9] Source: Midwestern Regional Climate Center, https://mrcc.purdue.edu/gismaps/cntytorn

| Date | Time | Magnitude | Length | Width | Deaths | Injuries |
|---|---|---|---|---|---|---|
| **Apr 2, 1880** | 20:00 | F2 | 1 mile | 200 yards | 0 | 4 |
| **Apr 2, 1892** | 08:00 | F2 | 5 miles | 400 yards | 0 | 5 |
| **Jan 2, 1897** | 15:45 | F3 | 6 miles | 300 yards | 5 | 21 |
| **May 13, 1908** | 17:30 | F4 | 25 miles | 200 yards | 49 | 135 |
| **Feb 12, 1912** | 15:00 | F3 | 15 miles | 200 yards | 8 | 50 |
| **Mar 11, 1921** | 15:30 | F2 | 5 miles | - | 3 | 15 |
| **Apr 14, 1927** | - | F2 | 1 mile | 150 yards | 0 | 20 |
| **May 9, 1927** | 14:25 | F2 | 1 mile | 100 yards | 0 | 0 |
| **Dec 17, 1933** | 09:30 | F2 | 20 miles | 100 yards | 5 | 20 |
| **Feb 17, 1938** | 21:40 | F4 | 7 miles | 200 yards | 21 | 50 |
| **Mar 12, 1940** | 16:30 | F3 | 30 miles | 200 yards | 10 | 60 |
| **Jun 10, 1941** | 14:00 | F2 | 20 miles | 150 yards | 0 | 5 |
| **Oct 26, 1941** | 20:30 | F2 | 13 miles | 150 yards | 0 | 3 |
| **Jan 3, 1949** | 14:45 | F2 | 25 miles | 100 yards | 0 | 14 |
| **Feb 12, 1950** | 13:00 | F4 | 20 miles | 200 yards | 8 | 70 |
| **Feb 19, 1952** | 09:00 | F2 | 0.5 miles | 200 yards | 0 | 5 |
| **Nov 7, 1957** | 14:30 | F2 | 15 miles | 100 yards | 0 | 0 |
| **Apr 24, 1964** | 08:45 | F3 | 18 miles | 300 yards | 0 | 2 |
| **Apr 17, 1978** | 18:49 | F2 | 5 miles | 100 yards | 0 | 14 |
| **Dec 3, 1978** | 01:50 | F4 | 8 miles | 400 yards | 2 | 266 |
| **Apr 25, 1982** | 20:15 | F3 | 7 miles | 200 yards | 0 | 0 |
| **May 2, 1984** | 18:40 | F3 | 61 miles | 250 yards | 0 | 9 |
| **Apr 23, 1985** | 15:10 | F3 | 1 miles | 200 yards | 0 | 0 |

| Date | Time | Magnitude | Length | Width | Deaths | Injuries |
|---|---|---|---|---|---|---|
| **Apr 23, 1985** | 18:05 | F2 | 8 miles | 200 yards | 0 | 0 |
| **Nov 15, 1987** | 19:00 | F3 | 20 miles | 500 yards | 0 | 73 |
| **Jan 23, 1996** | 14:38 | F2 | 7 miles | 400 yards | 0 | 30 |
| **Jan 1, 1999** | 22:26 | F2 | 3.2 miles | 33 yards | 0 | 1 |
| **Apr 3, 1999** | 15:52 | F4 | 6.7 miles | 200 yards | 0 | 12 |
| **Apr 23, 2000** | 16:40 | F3 | 25 miles | 500 yards | 0 | 3 |
| **Apr 9, 2009** | 20:59 | EF2 | 19.43 miles | 500 yards | 0 | 2 |
| **Oct 29, 2009** | 15:13 | EF2 | 3.43 miles | 600 yards | 0 | 1 |
| **Jan 20, 2010** | 17:38 | EF3 | 7.93 miles | 1087 yards | 0 | 0 |
| **Apr 26, 2011** | 19:16 | EF2 | 5.04 miles | 850 yards | 0 | 0 |
| **Apr 28, 2014** | 20:09 | EF2 | 3.48 miles | 550 yards | 0 | 0 |
| **Jan 21, 2017** | 17:23 | EF2 | 2.37 miles | 400 yards | 0 | 0 |
| **Dec 13, 2022** | 16:36 | EF2 | 3.46 miles | 700 yards | 2 | 2 |

**Table 1:** Significant tornadoes (F2/EF2 intensity or greater) occurring at least partially in Caddo Parish since 1880. Information on tornadoes prior to 1950 is not as complete because the National Weather Service did not begin systematic record keeping until later.[10]

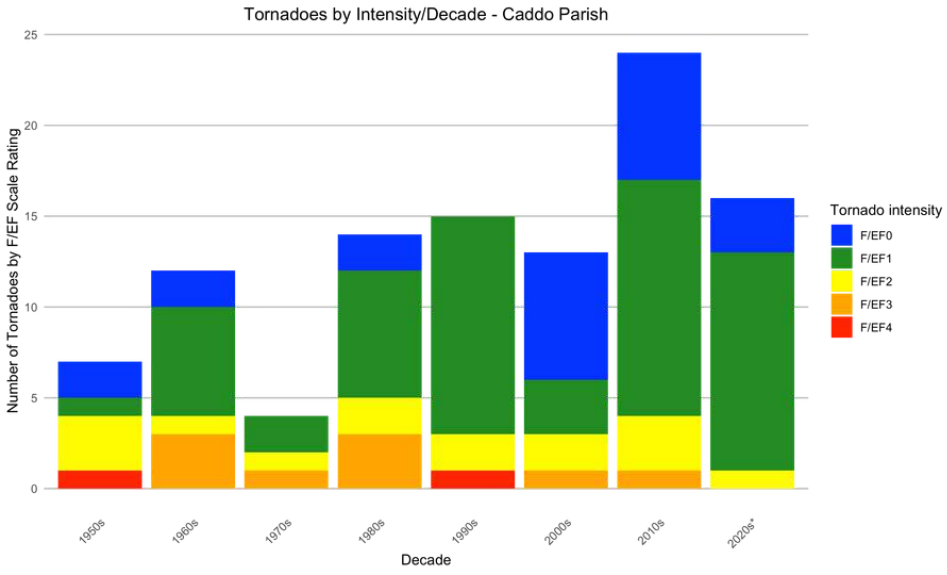


**Figure 8:** Number of tornadoes, by decade, affecting Caddo Parish.[11]

[10] Source: NCEI Storm Events Database and The Tornado Project, https://www.tornadoproject.com/index.html

[11] Source: NCEI Storm Events Database, https://www.ncei.noaa.gov/stormevents/

***Thunderstorms***

On average, Shreveport experiences 60-65 days of thunderstorms per year.[12] Most of these are not severe. Severe thunderstorms are defined as having hail of one-inch diameter or larger, winds of 50 knots (57 mph) or greater, or tornadoes. Of these, wind is the most common threat. Severe wind speeds occur within 25 miles of Shreveport on about 5-6 days per year.[13]

There have been 27 instances of wind speeds of 70 knots (80 mph) or greater in Caddo County since 1955. This equates to a strong wind event about twice out of every five years. The highest estimated wind speed occurred on April 22, 1997, when downburst winds of up to 115 mph damaged 11 hangers and five airplanes and toppled numerous trees and power lines, leaving 70,000 people without power for up to four days.

| Date | Location | Time | Speed (Knots) | Deaths | Injuries |
|---|---|---|---|---|---|
| **Oct 1, 1956** | Caddo Parish | 17:45 | 70 | 0 | 0 |
| **Aug 22, 1962** | Caddo Parish | 16:00 | 75 | 0 | 0 |
| **Apr 1, 1983** | Caddo Parish | 13:50 | 70 | 0 | 0 |
| **Nov 23, 1983** | Caddo Parish | 2:35 | 76 | 0 | 0 |
| **Apr 12, 1991** | Caddo Parish | 6:45 | 70 | 0 | 3 |
| **Apr 19, 1991** | Caddo Parish | 12:20 | 70 | 0 | 0 |
| **May 3, 1991** | Caddo Parish | 6:32 | 76 | 0 | 0 |
| **Oct 29, 1992** | Caddo Parish | 19:40 | 71 | 0 | 0 |
| **Apr 4, 1997** | Spring Ridge | 16:10 | 80 | 0 | 0 |
| **Apr 22, 1997** | North Shreveport | 6:55 | 100 | 0 | 0 |
| **Jun 13, 1997** | Vivian | 18:56 | 90 | 0 | 1 |
| **Aug 20, 1997** | Ida | 19:00 | 70 | 0 | 0 |
| **Mar 2, 1999** | Shreveport | 17:05 | 70 | 0 | 0 |

[12] Source: National Weather Service Jetstream, https://www.noaa.gov/jetstream/thunderstorms

[13] Source: NWS Storm Prediction Center, https://www.spc.noaa.gov/wcm/

| Date | Location | Time | Speed (Knots) | Deaths | Injuries |
|---|---|---|---|---|---|
| **Apr 26, 1999** | Shreveport | 11:25 | 90 | 0 | 0 |
| **May 27, 2000** | Shreveport Rgnl Arpt | 20:30 | 70 | 0 | 0 |
| **May 31, 2001** | Shreveport | 4:40 | 70 | 0 | 0 |
| **Oct 11, 2001** | Shreveport | 8:50 | 70 | 0 | 0 |
| **Apr 7, 2002** | Vivian, Hosston | 22:36 | 80 | 0 | 0 |
| **May 16, 2013** | Keithville | 14:05 | 91 | 0 | 0 |
| **May 28, 2017** | La Rosen, Four Forks | 17:20 | 70 | 0 | 0 |
| **May 28, 2017** | Forbing | 17:20 | 74 | 0 | 0 |
| **May 8, 2019** | Forbing | 14:54 | 70 | 0 | 0 |
| **Jan 11, 2020** | Caddo | 0:44 | 70 | 1 | 0 |
| **Nov 11, 2021** | Longwood | 0:57 | 74 | 0 | 0 |
| **Apr 12, 2022** | La Rosen | 20:47 | 74 | 0 | 0 |
| **Apr 2, 2023** | Blanchard | 18:38 | 74 | 0 | 0 |
| **Jun 16, 2023** | Forbing, Robson | 0:32 | 70 | 0 | 0 |

**Table 2:** Estimated or measured wind speed of 70 knots (80 mph) or greater in Caddo Parish since 1955.[14]

[14] Source: NCEI Storm Events Database, https://www.ncei.noaa.gov/stormevents/

[15] Source: NWS Storm Prediction Center, https://www.spc.noaa.gov/wcm/

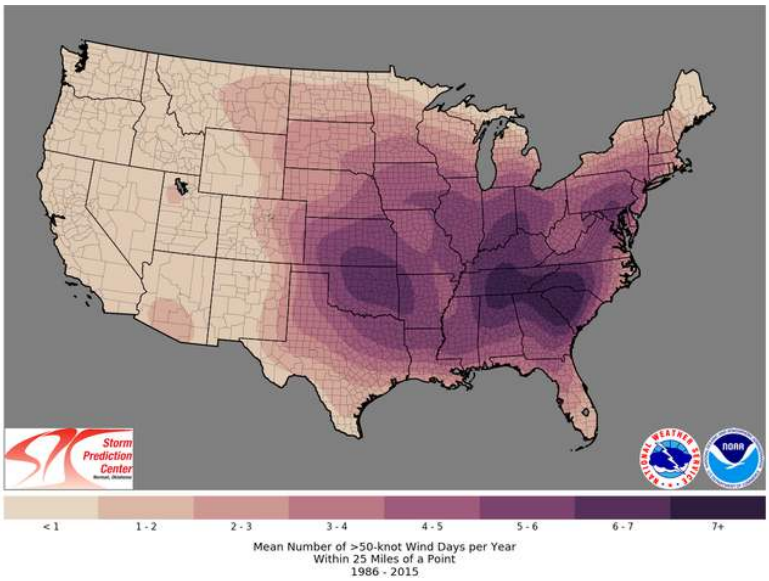


**Figure 9:** Mean annual number of days with wind speed of 57 mph (50 knots) or greater within 25 miles of a point.[15]

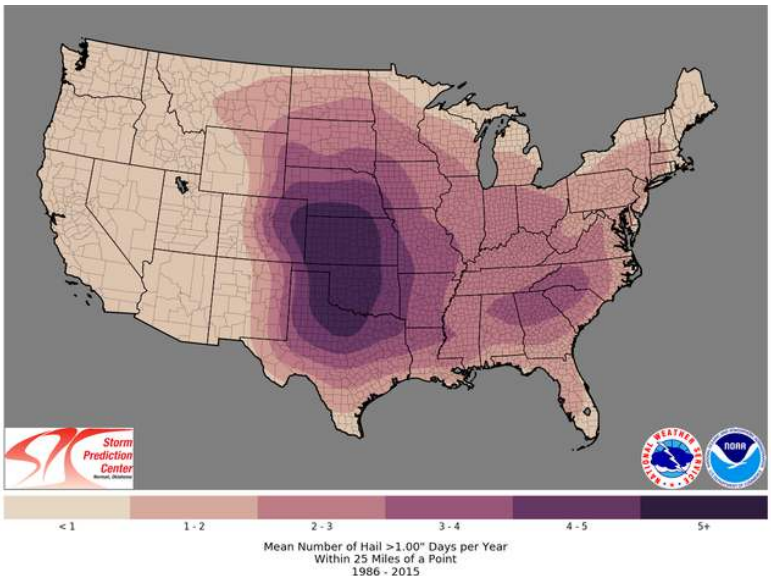


**Figure 10:** Mean annual number of days with hail of one inch diameter or larger within 25 miles of a point.[16]

Damaging hail occurs in or near Shreveport, on average, 3-4 days per year. The National Centers for Environmental Information Storm Events Database shows 34 days on which hail of 2-inch diameter or greater was reported in Caddo County. The largest recorded hail size in Shreveport was 4.5-inch diameter hailstones (grapefruit size) on April 22, 1995 and April 23, 2000. In both events, there was extensive damage to vehicles and rooftops, with many windows broken. There have also been 11 other instances of baseball-sized hail (2.75-inch diameter) since 1955.

As information collection continues to improve, the number of severe storm events has increased. This is attributable to more systematic reporting, proliferation of observers (including media and storm chasers), and easier reporting methodologies such as smart-phone apps.

This is particularly true with weaker storms that may have previously gone unreported. This effect is visible in the data displayed in Figure 8, where the overall number of reported tornadoes in Caddo Parish in the 2010s and 2020s is much higher than prior decades, but this difference is driven by significantly more weaker tornadoes being detected using improved methods relative to prior decades. Consequently, trends in the number of tornadoes, hail, or wind events should be investigated closely and not necessarily attributed to changes in the actual frequency of events.

[15] Source: NWS Storm Prediction Center, https://www.spc.noaa.gov/wcm/

[16] Source: NWS Storm Prediction Center, https://www.spc.noaa.gov/wcm/

***Hurricanes and Tropical Storms***

Although Shreveport is not near the coast and therefore not subject to the most intense features of hurricanes, it nevertheless is affected by hurricane and tropical storm remnants that track northward from the Gulf of Mexico. Storms that make landfall between Matagorda Bay in Texas and Vermillion Bay in Louisiana are most likely to track northward across the Shreveport area.

Since 1865, 26 tropical storms or hurricanes have tracked within 50 miles of Shreveport – a distance at which Shreveport is likely to experience strong winds and heavy rainfall.This equates to a return-period of once every 5-6 years. Shreveport has been affected by tropical storms six times since 2005, but had 16 years preceding that in which there were no nearby storms.

The most recent of these (as of this writing) was Hurricane Beryl in 2024, which tracked just to the west of Shreveport. Beryl achieved Category 5 status over the Caribbean Sea but had diminished to Category 1 at landfall near Houston. It had weakened to a tropical depression with sustained wind speeds of 30 knots (35 mph) as it passed Shreveport. Hurricane Beryl produced a low-end EF2 tornado that tracked over Barksdale AFB and left 20,000 customers without power in northwestern Louisiana. Shreveport airport recorded 2.63 inches of rain from the storm.

The strongest storm to affect Shreveport was an unnamed Hurricane in 1879. It had reached Category 2 strength before making landfall east of Houston. It maintained Tropical Storm force winds (50 knots [57 mph] sustained wind speed) when it reached Shreveport, where it passed directly overhead.

Hurricane Laura in 2020 maintained Category 2 strength as it passed west of Alexandria and was still at least a borderline Category 1 hurricane as it passed about 45 miles east of Shreveport. Only two inches of rain fell in Shreveport, but western Caddo Parish experienced flooding from Hurricane Laura, with wind gusts of 66 mph recorded at the Shreveport Regional Airport, downing numerous trees and power lines, causing some damage to homes.

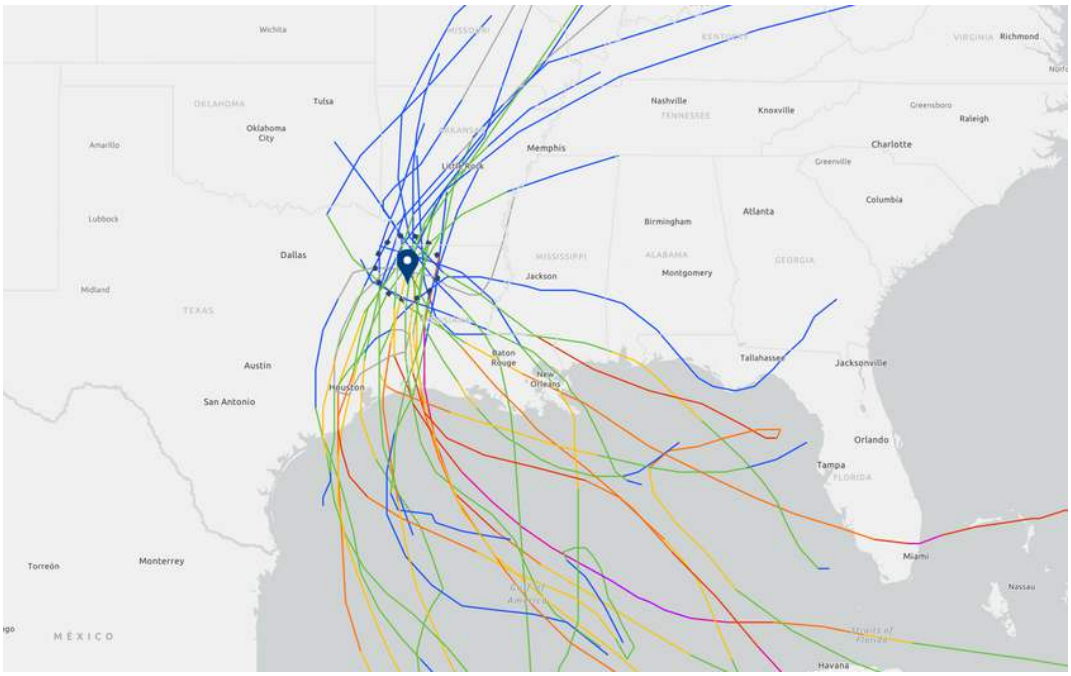


**Figure 11:** Hurricane and tropical storm tracks affecting Shreveport, 1865-2024. [17]

### *Flooding*

Flooding is a recurrent threat for Shreveport, due to the Red River and backup of water in area bayous. Multiple flooding events occurred between 2015-2019, but aside from some localized flooding, it has not been a significant issue since 2019 or in more than a half-century before 2015. A major flood occurred in 2015, but previously had not occurred since 1990 and before that, 1958. In addition to the Red River, Shreveport is susceptible to tropical moisture-laden air from the Gulf of Mexico which can result in intense thunderstorms capable of causing localized flooding.

Minor flooding occurs when the Red River rises above 30 feet at Shreveport. Moderate flooding occurs at 31.5 feet and major flooding at 33 feet. At 37.5 feet, flooding would be expected to cause severe backwater flooding of Cross and Twelve Mile Bayous and close entrance and exit ramps to the Shreveport-Blanchard highway with Interstate 220 interchange. At 39.5 feet, severe flooding would be expected in downtown Shreveport in the riverfront areas, including area casinos.

The record crest for the Red River at Shreveport was 45.90 feet on August 10, 1849. Crests above 40 feet occurred fairly frequently in the past, but upstream flood control facilities have reduced this threat substantially. The highest level in more than the past half-century was 37.14 feet on June 9, 2015. There were also crests above 30 feet in 2016, 2018, and 2019.[18]

[17] Source: NOAA, https://coast.noaa.gov/hurricanes/#map=4/32/-80

[18] Source: NWS National Water Prediction Service, https://water.noaa.gov/gauges/svpl1

As far as rainfall, flood risk is often stated as “return periods”, or the probability of having a flood of a given magnitude occur once in a specified number of years. For example, a 100-year flood would be an event that would be expected to occur no more than once every century, or a 1% chance in any given year. Because flood risk is a statistical measure, the occurrence of a large flood does not mean that another will not occur shortly after. Like flipping a coin, the probability of successive events (such as the coin landing heads-up twice in a row) is smaller than a single event but is never zero.

Furthermore, the statistics may change over time, due to changes in the landscape, building levees and retention ponds and lakes, straightening or lining channels, variability and change of climate, or upstream development. Any of these could increase or decrease the probability of a similar weather event having a greater or lesser impact than the one that occurred sometime previously. Return periods are useful as a guidance tool, such as for how much water a lake should be able to store, in order to build sufficient capacity to reduce impacts from likely events but keeping costs of construction as low as possible.

| Duration | Average Recurrence Interval for Rainfall (years) | | | |
|---|---|---|---|---|
| | **10** | **25** | **50** | **100** |
| 1 day | 6.23 | 7.7 | 8.97 | 10.3 |
| 2 days | 7.28 | 8.98 | 10.4 | 12 |
| 3 days | 7.83 | 9.59 | 11.1 | 12.7 |
| 7 days | 9.22 | 11 | 12.5 | 14.1 |
| 10 days | 10.1 | 12 | 13.5 | 15.1 |
| 20 days | 13 | 15.1 | 16.8 | 18.5 |
| 30 days | 15.4 | 17.8 | 19.6 | 21.5 |
| 45 days | 18.6 | 21.3 | 23.3 | 25.2 |
| 60 days | 21.4 | 24.3 | 26.5 | 28.5 |

**Table 3:** Recurrence Intervals for Shreveport, also known as return periods, are based on the average number of times a rainfall of the indicated magnitude would occur in the indicated accumulation period (duration). For example, a 7-day rainfall accumulation of 13.20 inches could be expected to occur once in 100 years because this value exceeds the expected 50 year return value for a 7 day period of 12.5 inches, but is below the expected 100 year return value of 14.1. By this same logic, a 7-day rainfall amount of 10.40 inches would be expected to occur about every 25 years if evenly spaced.[19]

[19] Source: NOAA Atlas 14, https://hdsc.nws.noaa.gov/pfds/pfds_map_cont.html?bkmrk=la

Shreveport has recorded 5 instances of rainfall exceeding the 1-day, 10-year return period since 1939, when records began at the airport. The greatest recorded one-day value was 10.44 inches on April 12, 1991, nearly matching the 100-year 1-day value. Flooding may become more likely when rainfall extends over several days. A seven-day total of 19.14 inches was recorded in April, 1991, greatly exceeding the 14.10 estimated 100-year return period. That threshold was also exceeded in June 1993 when 15.21 inches fell over a seven-day period.

Because the Red River originates far away from Shreveport, heavy rainfall in Oklahoma or north Texas has the potential to cause flooding in Shreveport, even without locally heavy rainfall. If the Red River is high from upstream rainfall, local bayous drain more slowly which may cause localized flooding when heavy rainfall does occur. The exact relationship between upstream rainfall and occurrence of flooding in Shreveport is difficult to determine because of upstream flood control structures, the length of time it takes for water to move down the river channel, infiltration rates of water into the stream bed and surrounding soil, and other management factors.

The flood of 2015 was the most damaging in recent experience, although crests along the Red River had been higher, as noted, more than 100 years ago. The flood formed as excessive heavy rainfall fell during May along the Red River basin in southern Oklahoma, northern Texas, and southwestern Arkansas. As that water made its way downstream, it raised the river levels to flood stage. At Shreveport, the river rose above flood stage on May 30, above major flood stage on June 3, and crested at 37.14 feet on June 9, the highest crest since 1945.

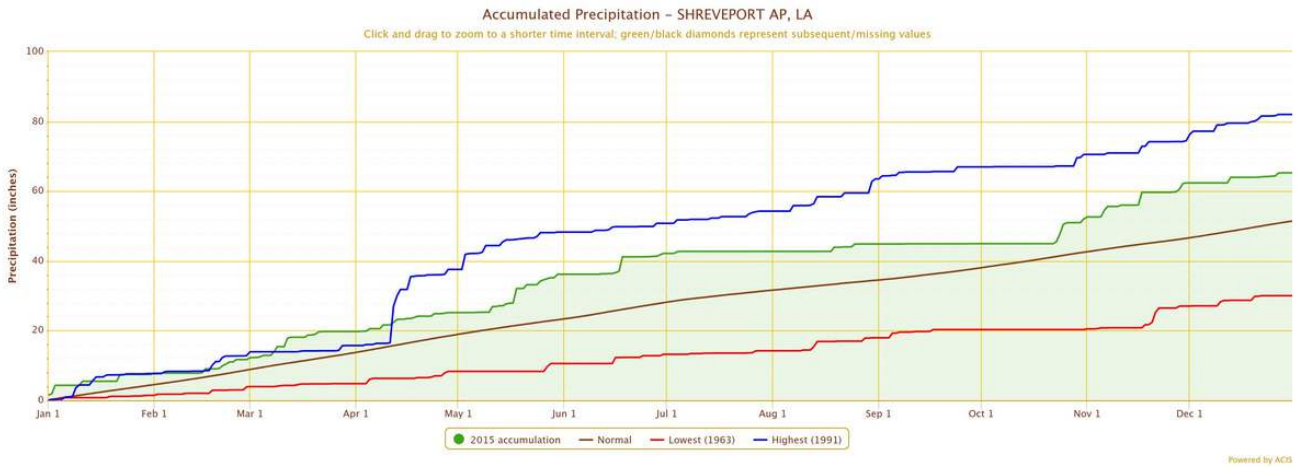


**Figure 12:** Rainfall accumulation at Shreveport Airport for a calendar year. The Green line indicates 2015 accumulation. The blue line is the record rainfall (1991), the red line is the driest year (1963), and the brown line indicates annual average.[20]

[20] Source: NOAA National Centers for Environmental Information Global Historical Climatology Network, https://www.ncei.noaa.gov/products/land-based-station/global-historical-climatology-network-daily

The river dropped below flood stage on June 17. A secondary crest causing minor flooding occurred June 30 as the remnants of Tropical Storm Bill raised river levels once again. Bank erosion was extreme on the Caddo Parish side of the Red River with 5,000 acres of farmland and pastureland inundated. Several bridges across the river were closed, including the westbound lane of I-220. At least 26 roadways across Caddo Parish were closed.

Approximately 150 dwellings were affected with 40 homes completely inundated, particularly in the Allendale and Martin Luther King Jr. subdivisions. The downtown Shreveport River Front suffered severe flooding, with two feet of water covering the Clyde Fant Parkway and Barnwell Center, although businesses were spared due to extensive sandbagging efforts. The water treatment plants were not damaged but required extensive efforts to protect them. Damage in Caddo Parish was estimated at $8.2 million.

Areas of the city may also be susceptible to shorter-duration, intense rainfall from thunderstorms or remnants of tropical systems that can cause localized flooding. Rainfall appears to be occurring in more intense, shorter-duration events, meaning that rain rates increase, causing problems for stormwater systems that are designed for less intense rainstorms. A study by SCIPP shows an increase of about 20% in precipitation intensity, which means a rainfall rate of 2.0 inches per hour may now result in 2.4 inches per hour.

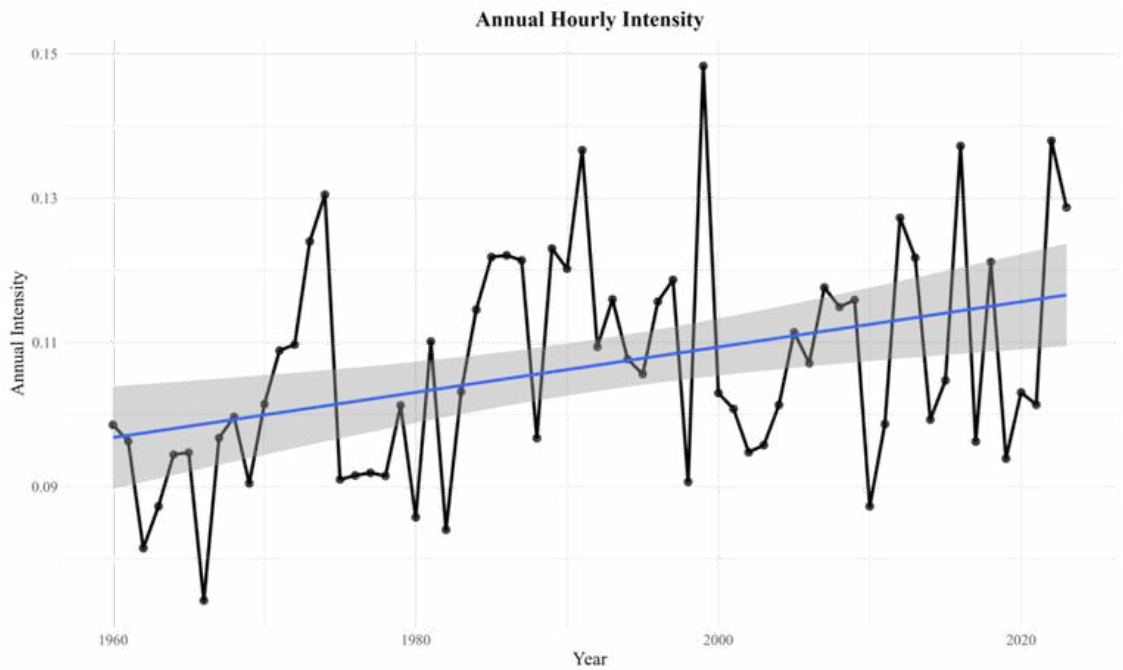


**Figure 13:** Average annual hourly precipitation intensity for Shreveport. Dots indicate individual year average intensity; blue line indicates trend.[21]

[21] Source: Southern Climate Impacts Planning Program, https://www.southernclimate.org/resources/tools/

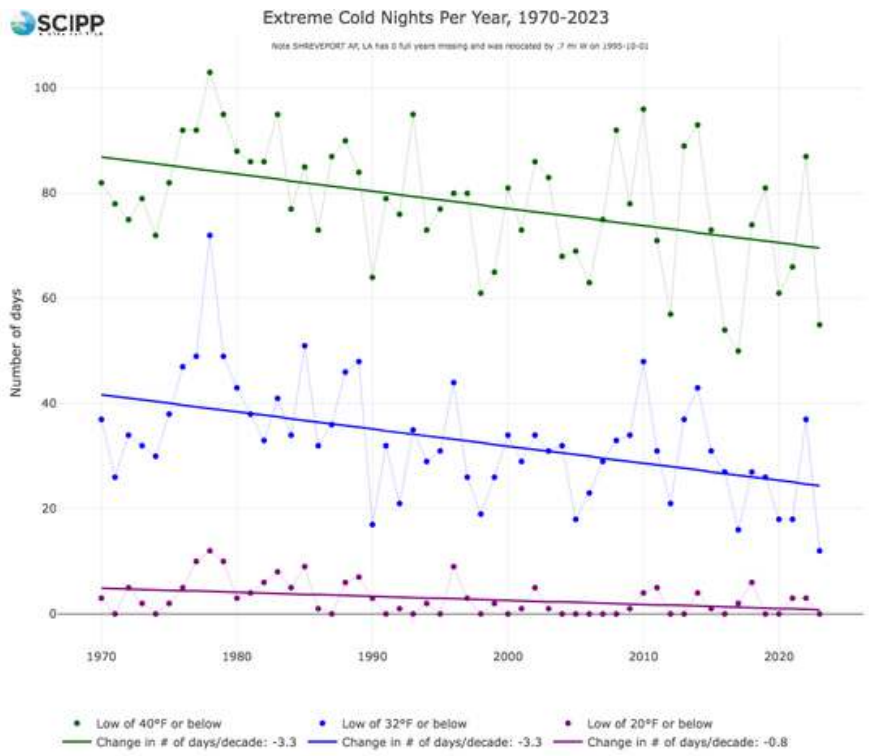


**Figure 14:** Trends in the number of nights with a temperature of 40 degrees or lower (green), 32 degrees or lower (blue), and 20 degrees or lower (purple) for Shreveport, 1970-2023.[22]

### *Winter Storms*

In general, the number of cold nights in Shreveport has been decreasing since the 1950s. Currently, Shreveport averages 26 nights per year in which the temperature dips below freezing. This is compared to over 40 nights, on average, in the 1970s. The number of freeze days are declining, on average, 3.3 days per decade.There is a similar downward trend in days of 20 degrees or lower, with an average of about one such night per year compared to 5 such nights in the 1970s.

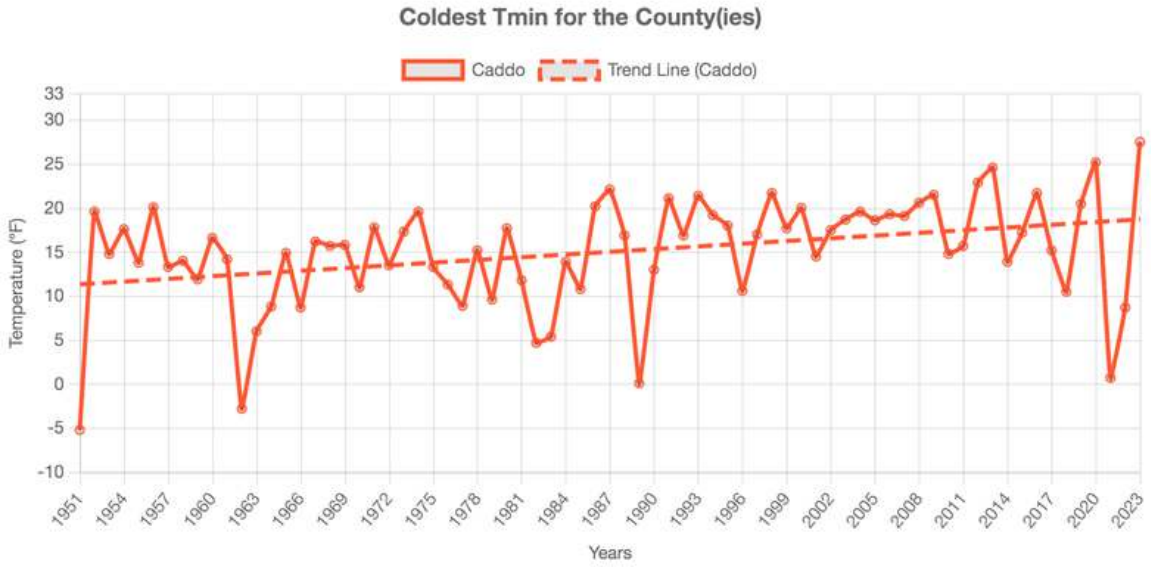


**Figure 15:** Coldest annual minimum temperature recorded in Caddo Parish (dots) and trend line (dashed line), 1951-2023.[23]

The expected coldest minimum temperature has risen from 11 degrees in 1951 to 18 degrees in 2023, although individual years can vary substantially, as evidenced by the winter of 2020-2021.

[22] Source: Southern Climate Impacts Planning Program, https://scipprisa.shinyapps.io/SCIPP_temp_dash/

[23] Source: Southern Climate Impacts Planning Program, https://cmintemp.scipp.lsu.edu/

The lowest recorded temperature at Shreveport Regional Airport (since 1939) occurred on February 16, 2021 when the temperature dipped to 1 degree Fahrenheit. Temperatures have fallen to 10 degrees or lower 24 times since 1939, but only 3 times since the year 2000, the other two times than February 16, 2021, being February 15, 2021 and December 23, 2022. It is rare to get consecutive days with the minimum temperature dropping below 20 degrees each day. The longest such run of 5 days occurred four times: December 22-26, 1983; January 9-13, 1962; January 30-February 3, 1951; and January 23-27, 1940. The 2021 outbreak had only two consecutive days below 20 degrees, although those two days were among the lowest on record. Temperatures have dipped below freezing as long as 20 consecutive nights in 1948, but the longest run in the last few decades was 13 nights in 2010. In both December 1983 and January 1978, there were five consecutive days in which the temperature never rose above freezing. The February 2021 outbreak lasted 3 days with the temperature never breaking the freezing mark.

Some snow in Shreveport during the winter is not unusual, but accumulation of more than a few inches is rare. Shreveport averages 1.5 inches of snow per year, although accumulations of 1 inch or more happen only about 4 in every 10 years. The greatest seasonal snowfall accumulation was 14.0 inches in the winter of 1947-1948. Second place goes to the winter of 2020-2021 with 9.5 inches. Only 14 out of 64 years of observations has recorded a seasonal snowfall of 4 inches or greater. Seven out of 25 years since 2000 have recorded one inch or more of snow in a season, with four of those recording 4 inches or more. The Shreveport Regional Airport has recorded one inch of snow or greater on a single day 44 times since 1939, or about once every two years. There have been 10 reports of snowfall of 4 inches or greater on a single day. Notably, there have been several recent multi-day totals with significant impacts: 6.0 inches in a 3-day period ending February 17, 2021; 5.4 inches ending February 12, 2010; and 4.1 inches ending February 25, 2015.

While heavy snowfall can impede city operations for an extended time, it typically does not cause much damage to infrastructure. Older structures not built to hold the weight of much snow could collapse in the heaviest events. Tree limbs may catch the snow, especially if it occurs while leaves are still on trees, causing limbs to break resulting in power outages and a threat to those walking underneath. Ice storms, however, are capable of doing much more extensive damage. Snow and sleet will not stick to power lines. Freezing rain will coat the lines, causing them to collapse under the added weight. An ice storm in December 2000 caused such extensive damage.

| Snowfall (inches) | Date |
|---|---|
| 7.9 | 1/19/1948 |
| 7.7 | 1/30/1949 |
| 5.6 | 1/13/1982 |
| 5.4 | 12/16/1983 |
| 5.4 | 1/30/1977 |
| 4.5 | 1/16/1948 |
| 4.4 | 2/1/1985 |
| 4 | 2/4/2011 |
| 4 | 2/11/2010 |
| 4 | 3/3/1965 |

**Table 4:** Snowfall events of 4 inches or greater recorded in Shreveport, 1939-2025.[24]

The presence, or lack of, a layer of warm air between the surface and the cloud govern winter precipitation type. If there is a deep layer of cold air without an intervening warm layer throughout the lower atmosphere, precipitation will fall as snow. Such deep, cold air is unusual in Louisiana; consequently rain or other precipitation types occur more frequently. If there is an intervening layer of air that is above freezing, that may be sufficient to allow snowflakes and ice crystals falling from the cloud to melt. If the warm layer is thin and the cold air near the surface is sufficiently deep, the liquid drops have time to re-freeze before reaching the surface, resulting in sleet or ice pellets.

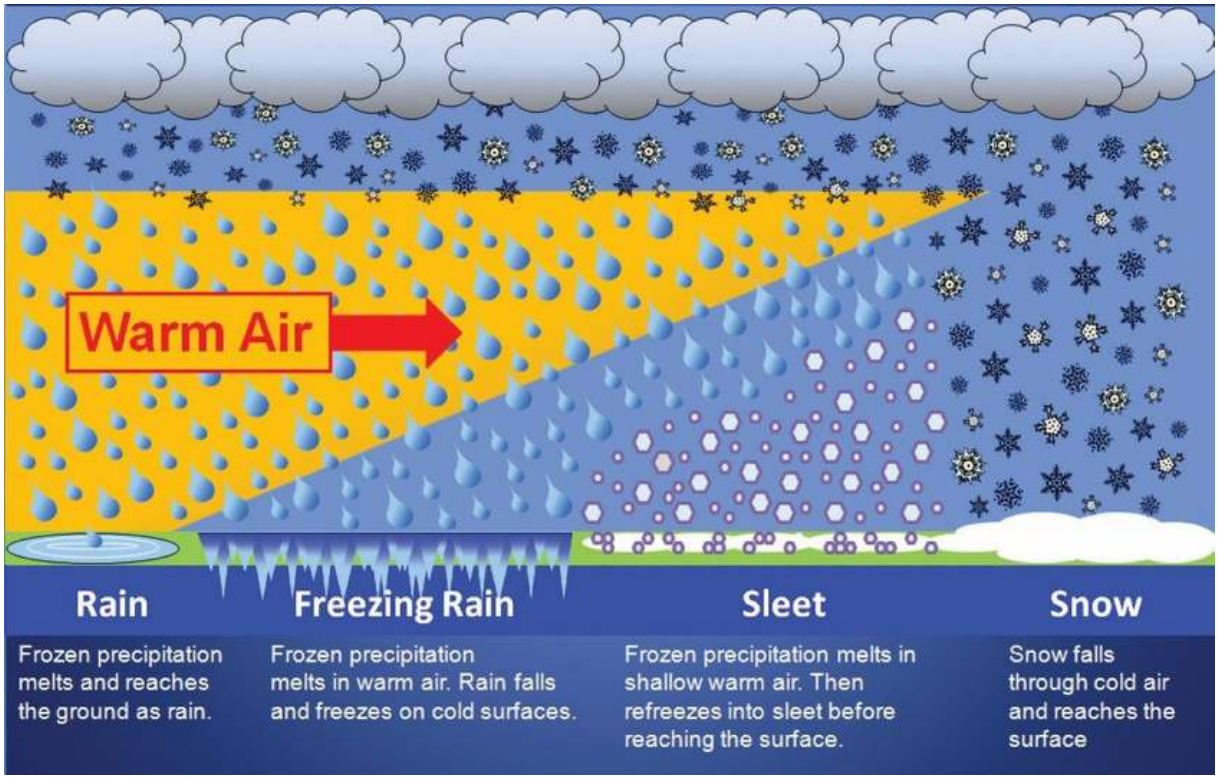


**Figure 16:** Intervening layer of warm air affects type of winter precipitation.[25]

[24] Source: NOAA National Centers for Environmental Information Global Historical Climatology Network, https://www.ncei.noaa.gov/products/land-based-station/global-historical-climatology-network-daily

[25] Source: Oklahoma Mesonet, https://mesonet.org/

If the warm layer is thicker and the cold layer near the surface is shallow, the liquid drops do not have time to re-freeze and instead freeze on contact with objects on the surface, resulting in freezing rain. Structures above the ground are most susceptible to freezing rain because residual heat stored in the soil may cause the ground to remain above freezing, even as objects just a few inches above the soil are below freezing.

Winter precipitation type is difficult to forecast because there is little real-time data on the vertical profile of the atmosphere. Without this information, the depth or location of a warm layer cannot be determined in advance. Further, cold fronts often stall across the region, causing air to rise along the front, creating precipitation.

| Date | Impacts |
|---|---|
| **Feb 3, 1996** | Ice storm causes 1 fatality, 3 dozen accidents in 3 hours. |
| **Dec 17, 1996** | Freezing fog created numerous traffic accidents along Interstate highways. |
| **Jan 6, 1997** | Ice accumulations of 1-2 inches downed numerous powerlines and tree limbs. |
| **Jan 12, 1997** | Another ice storm caused ¼-inch to 1-inch accumulations. |
| **Dec 22, 1998** | Ice storm left 250,000 without power, some for over a week; interstates closed; numerous injuries and vehicle accidents. |
| **Jan 26, 2000** | 1-4 inch ice accumulations; 30,000 homes without power; chicken houses and carports collapsed. |
| **Dec 12, 2000** | Ice storm caused $133M damages and 2 fatalities and left 235,000 customers without power; 29 steel tower transmission lines collapsed; 205 streets in Shreveport-Bossier City were blocked by tree limbs. |
| **Dec 24, 2000** | Devastating ice storm in Arkansas; Shreveport not significant affected by areas north of I-20 had some impacts. |
| **Jan 7, 2010** | Extended cold and ¼-inch of ice caused low water pressure as pipes burst causing $500,000 in property damages. |

| Date | Impacts |
|---|---|
| **Feb 11, 2010** | 5.4 inches of snow at Shreveport (over two days) with other areas of Caddo Parish recording up to 9 inches; wet, heavy snow caused tree damage and power outages to 100,000 customers; most snow from a single storm since 1983. |
| **Jan 9, 2011** | ¼-inch of freezing rain followed by 1 inch of sleet and snow caused numerous traffic accidents and isolated power outages. |
| **Jan 5, 2014** | Strong cold front with wind chill values near zero; coldest since February 3-5, 1996. |
| **Feb 11, 2014** | Ice accumulations of ¼ inch and 1 inch of snow |
| **Feb 23, 2015** | Ice accumulations of up to 1 inch |
| **Jan 16, 2018** | 1.8 inches of snow and ice caused significant travel impacts |
| **Jan 11, 2021** | 2-5 inches of snow across northern Louisiana, causing 56,128 power outages |
| **Feb 14-19, 2021** | Extended cold outbreak with 6 inches of snow; temperatures at Shreveport dropped to a record low of 1 degree with daytime highs below freezing, causing a total of 111 consecutive hours below freezing in Shreveport; widespread water line breaks cut off water for up to a week; treacherous roads slowed recovery crews; one homeless man died from hypothermia |
| **Dec 22-23, 2022** | Temperature dropped to 10 degrees at Shreveport with wind chills below zero across northern Louisiana; extended freeze caused multiple burst water pipes |
| **Jan 14-17, 2024** | 1 fatality as temperatures dropped to single digits with wind chills below zero; sleet accumulations 0.5 to 1.0 inch |

**Table 5.** Significant winter events affecting Caddo Parish since 1996.[26]

[26] Source: NCEI Storm Reports Database, https://www.ncei.noaa.gov/stormevents/

***Extreme Heat***

The climate and landscape of Louisiana are conducive for excessive heat to occur. During the summer, large areas of high pressure commonly sit just to the west of this region, leading to sunny skies and limited rainfall. As these conditions persist and temperatures climb, they form heat waves. On average, Shreveport experiences 9 days with maximum temperatures at or above 100 degrees. The highest temperature recorded was 110 degrees on both August 25 and August 26, 2023. The greatest number of 100-degree days in a year occurred in 2011, with 63 days. Other notable years include 1954 (39 days), 1980 (33 days), 1998 (35 days) and 2023 (36 days). More commonly, highs will reach 95 degrees an average of 40 days per year.

| Rank | Number of Days | Dates |
|---|---|---|
| 1 | 15 | August 14-28, 2011 |
| - | 15 | August 4-18, 1956 |
| 3 | 12 | July 30 – August 10, 2011 |
| - | 12 | July 7-18, 1980 |
| 5 | 11 | August 17-27, 2023 |
| - | 11 | August 25-September 4, 2000 |
| - | 11 | August 10-20, 1954 |
| 8 | 10 | July 28-August 6, 2023 |
| - | 10 | August 26-September 4, 1951 |
| 10 | 9 | August 3-11, 2015 |
| - | 9 | July 10-18, 1954 |

**Table 6:** Most consecutive days of temperatures at or above 100 degrees in Shreveport, 1939-2024.[27]

As with warming winter temperatures, Shreveport shows a similar – actually more pronounced – trend in summer temperatures. The number of days in which temperatures exceed 90, 95, or 100 degrees all show strong upward trends over the past five decades. Shreveport currently averages about 112 days per year with temperatures of 90 degrees or higher, 55 days of 95 degrees or higher, and 16 days of 100 degrees or higher, when considering trends instead of 30-year averages. Shreveport is gaining 6 days per decade of days with temperatures of 95 degrees or higher and nearly 3 days per decade of 100 degrees or higher. Again, there can be a great deal of variability, with some years never reaching 100 degrees, such as in 2021, and other years greatly exceeding these marks, such as 2023.

[27] Source: NOAA National Centers for Environmental Information Global Historical Climatology Network, https://www.ncei.noaa.gov/products/land-based-station/global-historical-climatology-network-daily

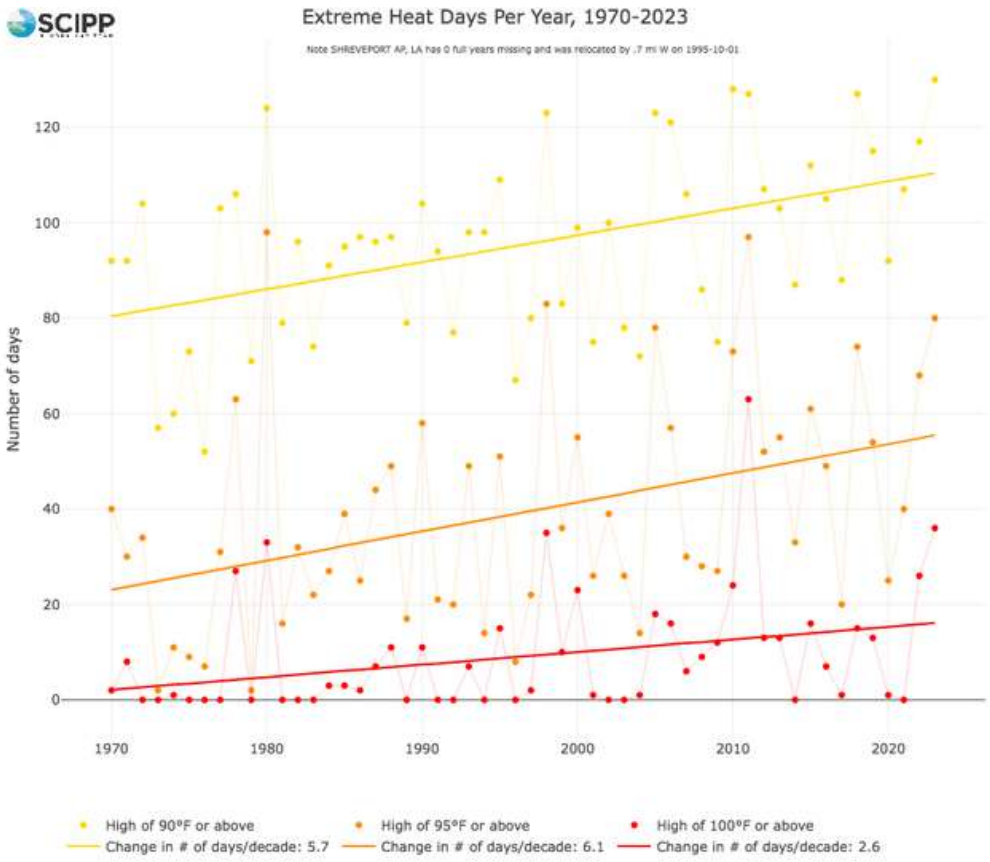


**Figure 17:** Trends in the number of days with a temperature of 90 degrees or higher (yellow), 95 degrees or higher (orange), and 100 degrees or higher (red) for Shreveport, 1970-2023.[28]

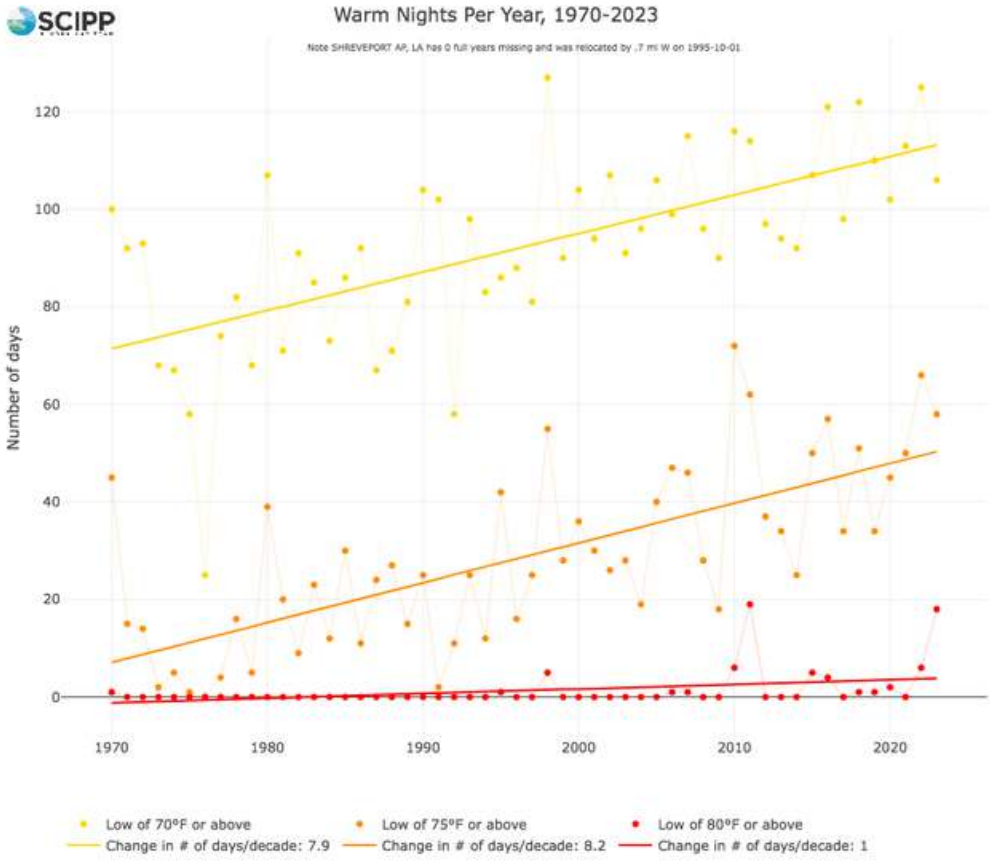


**Figure 18:** Trends in the number of days with a minimum temperature of 70 degrees or higher (yellow), 75 degrees or higher (orange), and 80 degrees or higher (red) for Shreveport, 1970-2023.[29]

[28] Source: Southern Climate Impacts Planning Program, https://scipprisa.shinyapps.io/SCIPP_temp_dash/

[29] Source: Southern Climate Impacts Planning Program, https://scipprisa.shinyapps.io/SCIPP_temp_dash/

Perhaps of greater concern is a dramatic increase in the number of warm nights. Studies have shown that heat waves are deadlier when temperatures do not cool much at night. High nighttime temperatures do not give the body a chance to rest and cool at night, which adds stress. This makes it more difficult to manage the daytime heat. Nighttime temperatures have shown an even stronger upward trend compared to daytime maximum temperatures.

Minimum temperatures now rarely drop below 70 degrees in the summer, with an average of 113 nights per year. Temperatures of 75 degrees and above occur frequently, with 50 nights per year compared to fewer than 10 such nights in 1970. More critical values, such as temperatures remaining at or above 80 degrees were nearly unheard of before 2010, but now can expect about 4 such nights per year. There were 19 nights that stayed at or above 80 degrees in 2011 and 18 nights in 2023.

Although hot summers are a known reality of living in this region, it does not lessen the impacts to the area. The longer the excessive heat lasts, the more complications occur such as adverse health effects, water issues, agricultural issues, and the onset of drought. Extreme heat may also cause infrastructure failures, such as buckling of roadways. The impacts on human and animal health may be enhanced by high humidity or direct sunshine.

One reason nighttime temperatures are rising is because of humidity. Moist air cools more slowly than warm air, so humid nights tend to retain heat from the day longer. The body's mechanism to cool itself is to produce sweat. The moisture on the skin is evaporated, which is a cooling process as molecules must absorb energy (heat) in order to turn into vapor. This takes heat away from the body. When the air is moist, this process is less efficient; hence the body had more difficulty cooling off on humid days compared to drier days. The combination of heat and humidity is reflected in the Heat Index.

Extreme caution is advised when the heat index exceeds 90 degrees; danger is indicated for a heat index of 105 degrees; and extreme danger – meaning outside activity should be halted – is when the heat index exceeds 125 degrees. Shreveport averages 173 hours per year with a heat index of 105 degrees or higher and 17 hours of 110 degrees or higher. In 2023, Shreveport experienced ten times that amount, with 1,792 hours at 105 degrees or higher and 391 hours at 110 degrees or higher.

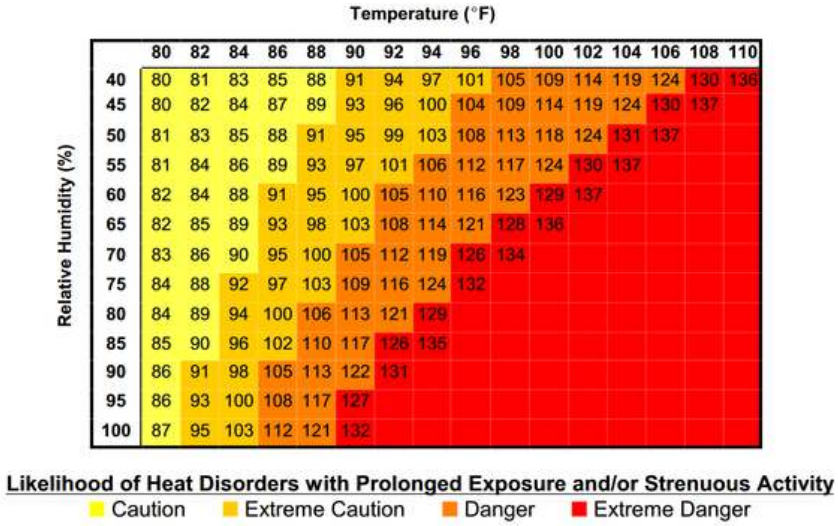


**Figure 19:** Heat Index. As humidity increases, the body becomes less able to cool itself through its natural mechanism by sweating. The heat index equates temperatures with high moisture content to an equivalent temperature without the moisture; for example a temperature of 90 degrees and 70% humidity has the same rate of cooling as a temperature of 105 degrees with no humidity.[30]

A newer method of calculating heat exposure is the Web Bulb Globe Temperature (WBGT). The WBGT takes into account wind and solar radiation, along with temperature and humidity, to produce a more complete measure of heat. Higher wind speeds can increase evaporation of sweat, which makes high heat more tolerable, but abundant direct sunshine increases the skin's temperature which means the body's cooling processes have to accelerate. Thus, the higher risks associated with working outside in the sun is reflected in the WBGT whereas it is not accounted for in Heat Index. WBGT is commonly used for athletic practices, military training, and worker safety. A drawback of WBGT is that it is not as intuitive as heat index, as a critical value of 90 for WBGT does not seem as high as 125 for the Heat Index.

| WBGT / RISK | IMPACTS | ACTIONS |
|---|---|---|
| 80-85 F / Low | Body stressed after 45 minutes | Take at least 15 minutes of breaks each hour if working or exercising in direct sunlight, Stay hydrated. |
| 85-88 F / Moderate | Body stressed after 30 minutes. HEAT CRAMPS likely (painful contraction of muscles, weakness) | Take at least 30 minutes of breaks each hour if working or exercising in direct sunlight. Drink ½ to 1 quart of water per hour. |
| 88-90 F / High | Body stressed after 20 minutes. HEAT EXHAUSTION likely (dizziness, nausea, vomiting, headache, fainting, disorientation, weakness) | Take at least 40 minutes of breaks each hour if working or exercising in direct sunlight. Reduce work, exercise intensity. Drink up to 1 quart of water per hour. |
| > 90 F / Extreme | Body stressed after 15 minutes. HEAT STROKE likely (extremely high body temp, confusion, convulsions, unconsciousness, death) | Take at least 45 minutes of breaks each hour if working or exercising in direct sunlight. Suspend all strenuous outdoor activities. Drink at least 1 quart of water per hour. |
| Adapted from U.S Army and OSHA guidelines and recommendations | | |

**Figure 20:** Wet Bulb Globe Temperature (WBGT) safety.[31]

[30] Source: National Weather Service Jetstream, https://www.noaa.gov/jetstream/synoptic/heat-index

[31] Source: National Weather Service, https://www.weather.gov/arx/wbgt

***Drought***

One of the major derivatives of excessive heat in Louisiana is drought. Northwestern Louisiana has a highly variable climate, varying between wetter and drier than normal periods. Drought conditions can strike Caddo Parish during any season and have frequently impacted the region throughout history. Most droughts in the region are short-duration, seasonal droughts. A major exception was during 2011, when exceptional drought (the highest category in the U.S. Drought Monitor) covered the entire parish from August-November.

The driest year on record at Shreveport Regional Airport (1939-present) was 1963, when 30.03 inches were recorded, although it was not the driest for northwest Louisiana in general. That honor goes to several years which were a virtual tie for driest in the region: 1936, 1943, 1954, and 2010. In all but 2010, the extremely dry year was followed by a near-normal to above-normal rainfall year; 2011 was nearly as dry as 2010 contributing to the exceptional drought. Since 2011, most years have ben near-normal to very wet, causing droughts to be seasonal, short-duration.

The longest-duration drought occurred in 2010-2011 when severe drought (D2) conditions existed for 62 consecutive weeks. Most severe droughts have ended within 3-4 months. Severe drought conditions lasted for 28 consecutive weeks in 2016, but other than 2010-2011 and 2016, no severe drought has lasted longer than 17 weeks since 1982. Even during droughts, Shreveport is likely to receive some rainfall. On average, Shreveport does not go more than 3 days between rainfall events. Consecutive dry spells lasting more than 11 days are rare.

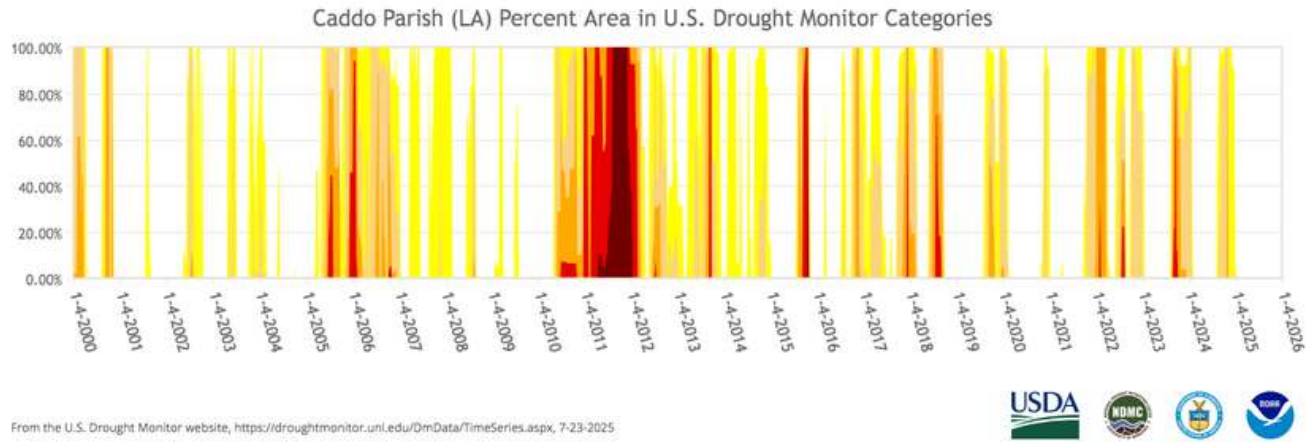


**Figure 21:** Drought category for Caddo Parish, 2000-2025. Yellow indicates abnormally dry (D0) – not drought conditions but perhaps heading into or coming out of drought. Moderate drought (D1) is shown in brown; severe drought (D2) in orange; extreme drought (D3) in red; and exceptional drought (D4) in crimson.[32]

[32] Source: U.S. Drought Monitor https://droughtmonitor.unl.edu/DmData/TimeSeries.aspx

| Drought Start | Drought End | Duration (weeks) |
|---|---|---|
| Oct 8, 2010 | Dec 17, 2011 | 62 |
| Nov 26, 1942 | Jan 8, 1944 | 58 |
| Feb 5, 1963 | Jan 15, 1964 | 49 |
| Feb 19, 1936 | Jan 1, 1937 | 45 |
| Aug 6, 1966 | May 28, 1967 | 42 |
| Dec 17, 1958 | Oct 1, 1959 | 41 |
| Jan 1, 1982 | Oct 8, 1982 | 40 |
| Dec 24, 1950 | Sep 24, 1951 | 39 |
| Oct 15, 1975 | Jun 24, 1976 | 36 |
| Apr 30, 1939 | Dec 24, 1939 | 34 |
| Jul 22, 1956 | Mar 19, 1957 | 34 |
| Sep 9, 1980 | May 7, 1981 | 34 |

**Table 7:** Longest periods of severe (D2) or greater drought for Shreveport, 1930-2023. The duration indicates the number of consecutive weeks in which the 3-month Standardized Precipitation Index (SPI) was -1.5 or lower, similar to the threshold for D2 (-1.3). The start date is based upon when the SPI goes below zero and the end date when the SPI returns above zero.[33]

### *Wildfires*

Because Shreveport gets abundant rainfall, on average, and typically does not go more than a few days between rainfall events, the risk of wildfire in the area is relatively low. But hot, dry conditions may develop from time to time, paired with high winds, that may cause wildfires to form. Wildfire risk within most of Shreveport city limits is very low with a moderate risk in some of the areas to the west of the City.

Wildfire risk is higher in the “wildland-urban interface” on the fringes of the city and in surrounding areas. According to the USDA Forest Service, 8,970 structures are at risk of direct exposure, where homes may be ignited by adjacent flammable vegetation as well as indirect sources. There are an estimated 22,6091 buildings subject to indirect exposure, where fires can spread through embers or home-to-home ignition. The majority of buildings, 57,549, are assessed as minimal exposure, where spreading wildfire is of little concern. There are not very many contiguous parcels of high wildfire danger; consequently fires should be easier to contain.

[33] Source: National Drought Mitigation Center, https://drought.unl.edu/

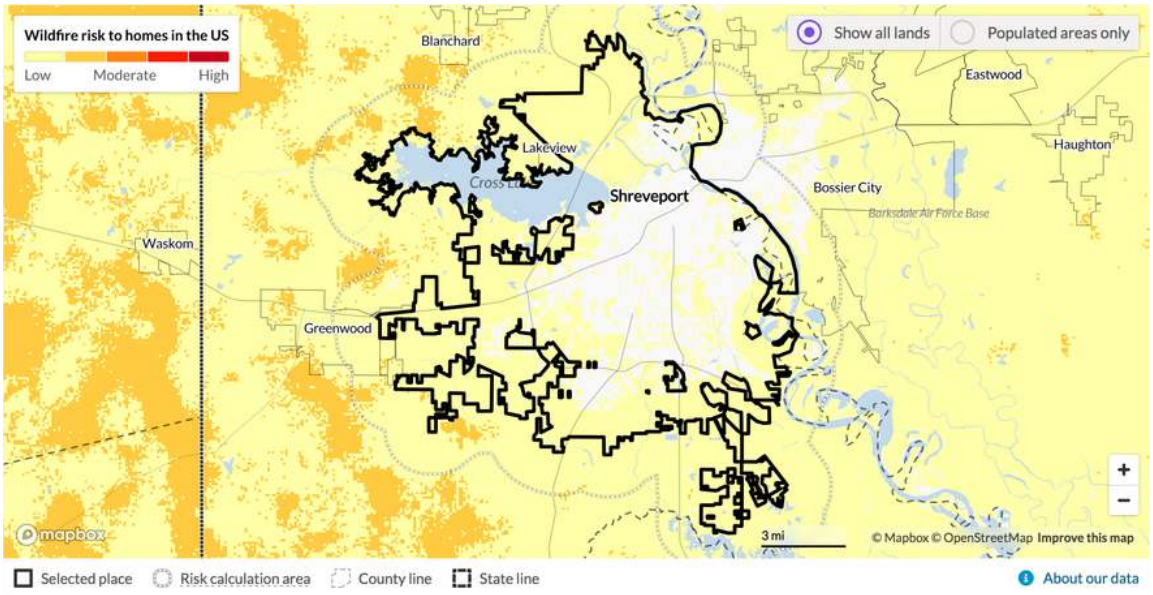


**Figure 22.** Wildfire risk in Shreveport.[34]

Wildfires are a natural component of the physical land, providing environmental benefits by shaping vegetation and ecological communities. Fire can be a beneficial tool in maintaining the health of pastures and controlling invasive species. Prescribed fire reduces fuel load, such as dry branches and tree limbs, that accumulate over time. Burning them under controlled conditions reduces the amount of fuel available later, which makes wildfires easier to control. Even in extreme drought, prescribed fire can be used safely when daily weather conditions allow.

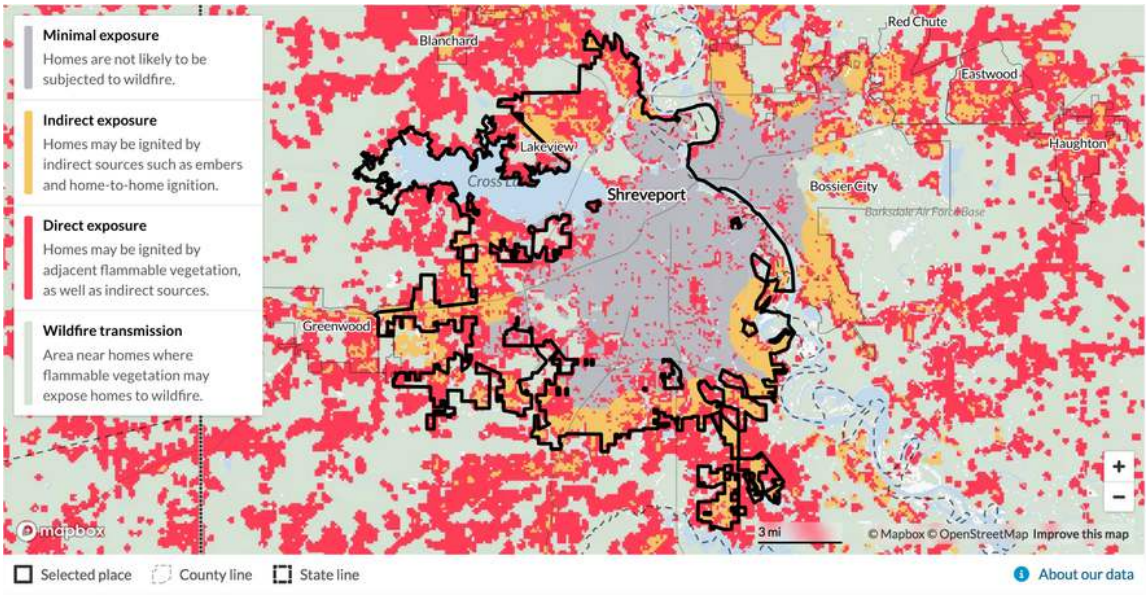


**Figure 23:** Wildfire risk reduction zones in Shreveport. [35]

[34] Source: USDA Forest Service, https://wildfirerisk.org/explore/overview/22/22017/2200070000/

[35] Source: USDA Forest Service, https://wildfirerisk.org/explore/overview/22/22017/2200070000/



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