"To provide weather and flood warnings, public forecasts and advisories for all of the United States...and it territories...for the protection of life and property.

National Weather Service

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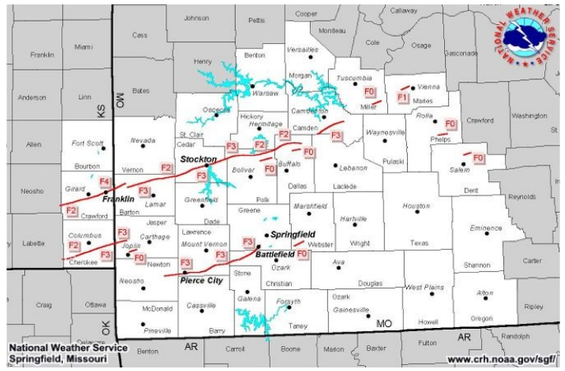
National Weather Service

Natural Hazard Risk Assessment Information For:

Taney County Missouri



Information Provided By
WFO Springfield, Mo

2009 Update

Includes data and information through December 2008

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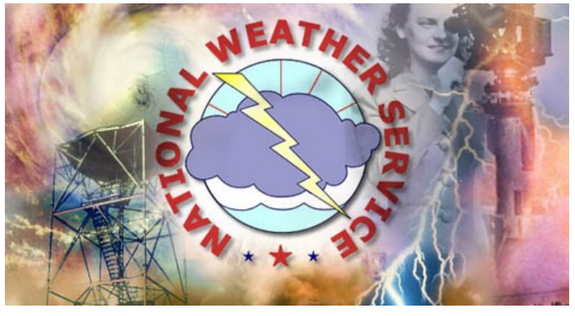


This document is intended to provide general information on severe weather that has affected Taney County and the communities with in the county.

By Gene Hatch
Meteorologist Intern WFO Springfield. Mo.

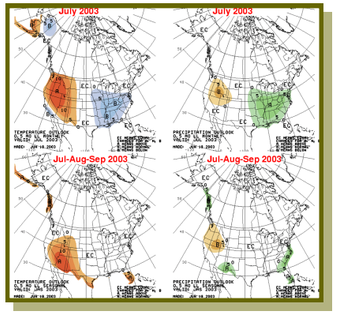
Local Climatology

Averages and records for Ozark Beach , Missouri in Taney County

	45	21		3.6	80	-15	17.3
	51	25		2.5	87	-19	13.6
	60	33		1.4	90	0	28.5
	70	41		0.1	96	20	2.0
	78	50		0	99	29	0
	86	59		0	105	40	0
	91	64		0	116	48	0
	90	62		0	108	40	0
	83	55		0	106	30	0
	73	43		0	96	22	0.5
	59	34		0.7	90	6	7.0
	48	25		1.4	81	-12	15.0

Links for Climate information

- www.crh.noaa.gov/sgf/
- www.cpc.ncep.noaa.gov/
- www4.ncdc.noaa.gov
- web.missouri.edu/~moclimat/
- mrcc.sws.uiuc.edu/
- agebb.missouri.edu/weather/index.htm



Historic Weather in Southwest Missouri

Jan. 2nd-1996...A winter storm produced heavy snow across much of Southwest and Central Missouri during the evening of the first into the early morning of the second. 12 inches of snow fell from Ava to Houston, while greater than 8 inches fell form Branson to Wet Plains northward to Rolla.

Jan. 5th–1998…Widespread heavy rainfall occurred over much of extreme southern Missouri from the late morning hours of the fourth into the morning hours of the fifth. Widespread rain totals of 1 to 3 inches occurred with higher amounts near Branson. The heavy rain fell on saturated ground causing flood waters to cover many highways and wash out low water crossings.

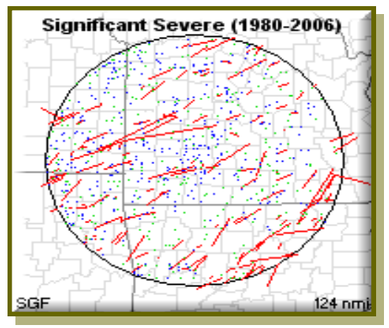
Apr. 16th-2001...thunderstorms raced across the Ozarks during the early morning hours producing high winds and three tornadoes. The first tornado tracked south and east of Redings Mill in northwest Newton County. The second tracked from the southwest side of Neosho to 3 miles southwest of Boulder City in south central Newton County. The same squall line moved rapidly southeast and produced another tornado around the Kimberling City area, west of Branson in south central Stone County. In addition to the tornadoes that occurred on April 15th, straight line winds, estimated as high

as 90 mph, produced a swath of damage across the Ozarks. The most significant damage occurred around Joplin, Neosho, and Kimberling City.

May 4th– 2003...Three tornadic supercell thunderstorms formed over southeast Kansas and moved across the Missouri Ozarks, spawning 13 tornadoes. This was a very rare event for this part of Missouri since many of the tornadoes experienced across this area are short lived small tornadoes. This event surpassed the December 17-18, 2002 tornado event in both loss of lives and property damage, and exceeded tornado events that occurred over the past 100 Years for this part of Missouri. The hardest hit locations included Battlefield, Stockton and Pierce City. 14 tornadoes resulted in extensive damage and 24 deaths. Several of the tornadoes tracked long distances ranging from 15 to 80 miles.

Dec. 17-18th-2002...At approximately 1118 pm a tornado struck near Chesapeake Mo. The F2 tornado hit the Lucky Lady trailer park in addition to 1 home northeast and 3 homes southwest of the trailer park. The tornado resulted in 1 fatality and 15 injuries.

Overview of Weather Hazards in Southwest Missouri & Extreme Southeast Kansas



Weather in the Ozarks

From 1961 to 2008, 522 tornadoes were reported in the 37 counties that WFO Springfield is responsible for, with an average of 11 occurring each year. There were 71 fatalities from these tornadoes, or near one and a half each year. Tornadoes occurred during every month of the year and at every hour of the day. The majority of these tornadoes are weak, but the occurrence of strong and violent storms is always a possibility and cannot be discounted.

The Ozarks experiences between 50 and 70 thunderstorm days a year. During any given storm, large hail, damaging winds and microbursts are possible. The Ozarks go through three severe thunderstorm seasons during the course of the year. The spring season is the period that supercell thunderstorms are most common, next comes summer as large clusters of storms move across the region, mainly during the overnight hours. Finally fall sees the return of supercells and tornadoes, squall lines and training storms (thunderstorms that form and move over the same area).

The region is affected during the course of any year by flooding, drought, heat and cold extremes and winter storms. Heat extremes and flooding have caused the greatest number of fatalities in the area. Winter storms affect the region in many forms. Ice storms, heavy snow and extreme cold have occurred across the area. Freezing rain is the typical form ice storms in the Ozarks take. Ice storms have deposited 2 to 3 inches of ice during their duration causing power outages, tree damage, and traffic problems.

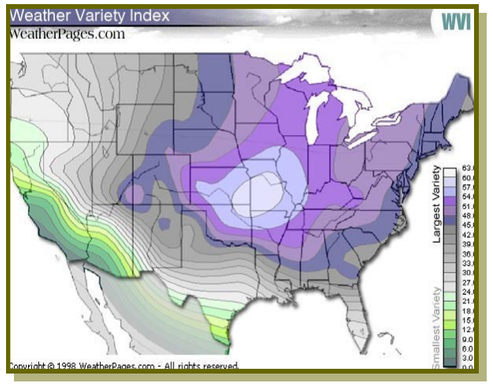
Tornadoes by county for the Springfield County Warning Area from 1950 to 2008

County	F0/1	F2	F3	F4	F5	County	F0/1	F2	F3	F4	F5	County	F0/1	F2	F3	F4	F5
BARRY	20	7	1	0	0	DOUGLAS	8	6	1	0	0	OREGON	9	4	2	1	0
BARTON	23	1	3	1	0	GREENE	19	10	3	1	0	OZARK	21	2	2	1	0
BENTON	18	2	4	0	0	HICKORY	8	1	1	0	0	PHELPS	15	4	2	0	0
BOURBON,KS	10	5	0	0	0	HOWELL	20	11	3	1	0	POLK	16	3	0	0	0
CAMDEN	15	6	1	0	0	JASPER	30	5	4	1	0	PULASKI	9	4	1	0	0
CEDAR	10	2	3	0	0	LACLEDE	9	6	1	0	0	SHANNON	11	1	1	0	0
CHEROKEE,KS	28	5	2	1	0	LAWRENCE	11	2	3	0	0	ST.CLAIR	13	2	2	0	0
CHRISTIAN	19	2	1	1	0	MARIES	4	3	0	0	0	STONE	10	3	0	0	0
CRAWFORD,KS	19	11	3	1	0	McDONALD	11	5	0	0	0	TANEY	6	1	0	0	0
DADE	11	2	2	0	0	MILLER	22	3	0	0	0	TEXAS	14	8	1	2	0
DALLAS	7	1	1	0	0	MORGAN	11	7	0	0	0	VERNON	20	1	6	0	0
DENT	8	1	1	0	0	NEWTON	30	5	1	2	0	WEBTSER	19	7	2	0	0
												WRIGHT	10	4	0	1	0

Historical information for Taney County, Missouri

Severe Weather in Taney County

In 2000, a private company looked at 277 cities across the United States. They rated each city on variations in temperature, precipitation and other factors. Of all the cities in their study Springfield, Missouri rated number one as the city with the most variable weather in the U.S.

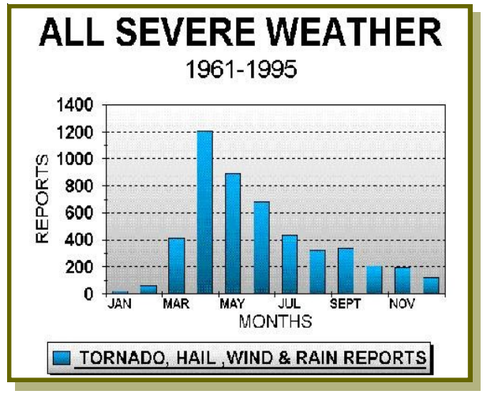


From www.weatherpages.com

Taney County Missouri is located on the Ozark Plateau along the eastern edge of tornado ally. Because of its location Taney County is subjected to severe thunderstorms, heavy rainfall, winter storms, flooding, ice storms, droughts, tornadoes and other wind storms.

When does severe weather occur ?

Severe weather in the Ozarks can occur in any month of the year. While the months of April through June are the peak severe weather season, there is a secondary peak from September to November.



Severe thunder storms in Taney County have dropped hail up to 1 3/4" in diameter, created winds in excess of 100 miles an hour and rainfall rates greater than 2" in an hour. While southwest Missouri receives nearly 11 tornadoes a year, Taney County averages an event every 7 years.

Number of Tornadoes in Taney Co. (1950 to 2008)

F0/F1	F2	F3	F4	F5
6	1	0	0	0
88%	12%	0%	0%	0%

During the winter season Taney County averages 9.7 inches of snow. With the most snow in one season at 39.0 inches, falling during the 1970 to 1971 winter season. Ice storms also affect the county during the winter season causing significant damage to homes, trees and utilities.

Dam Failure

Dams in Taney County

Taney County contains 6 dams. While the majority of theses dams are small and used primarily for storm water management, irrigation and recreation, some are a part of local reservoirs. Some of the dams in Taney County are of earthen construction and there have been no recorded failures. Two major dams are located in Taney county both of which produce hydroelectric power.

Where are they Located

- Ozark Beach Dam: White River, Forsyth
- Table Rock Dam: White River, Branson
- Rockwood Hills Lake Dam: Bee Creek, Rockaway Beach
- Shepherd of the Lake Dam: Roark Creek, Forsyth
- Silver Creek Lake Dam: Silver Creek, Branson
- Fall Creek Dam: Fall Creek, Forsyth

Most of the dams in Taney County are less than 100 feet high. Many are located on private land and fall under private ownership. Additional dams may be located in the county but are not significant enough to be listed.

Table Rock dam is a major dam over 250 feet in height and over 6400 feet in length. The dam is one of the most significant dams located in southwest Missouri.

Heat, Drought and Wildfires

Excessive heat is the leading cause of weather fatalities in the nation. With the variability of the weather in southwest Missouri, it is not surprising that excessive heat impacts Taney county on almost a yearly basis.

Taney County averages 21 days a year with temperatures at or above 95 degrees. July and August are the two warmest months, which average 8 days at or above 95 degrees.

Year	Days 95* +	Days 100* +	Days in a row
1954	89	57	18
1978	35	7	14
1980	63	32	25
1983	40	13	11
1990	36	11	16
2000	33	12	11
Normal # of Days	**21**	**5**	**▲ Above 95***

Years with above average summer heat

Drought and wildfires can, and often do accompany excessive heat. Taney County has gone through dry periods and drought. The latest droughts occurred in 1999 and 2000 when well below normal rainfall and high temperatures combined to produce drought conditions.

Longest periods without rainfall in Taney County

- 51 days: 14 Dec 1985 ~ 2 Feb 86
- 47 days: 2 Dec 1955 ~ 17 Jan 56
- 41 days: 10 Dec 1980 ~ 19 Jan 81
- 36 days: 25 May 1988 ~ 29 Jun 88
- 35 days: 6 Dec 1993 ~ 9 Jan 94
- 34 days: 9 Aug 2000 ~ 11 Sept 00

While no major wildfires have affected Taney County, small grass fires do pose a hazard.

A twenty year study by the Missouri Department of Conservation, from 1970 to 1989 determined that over 5500 fires occurred during that time in the Springfield Fire district which includes Cedar, Dade, Polk, Greene, Webster, Christian, Stone and Taney counties. This represented nearly 10% of the wildfires in the state with over 59,000 acres burned.

There are numerous ways wildfires can be started, but when dealing with weather related phenomenon, namely lightning, only 0.8% of the wildfires in the Springfield fire district were the result of lightning.

Tornado Information

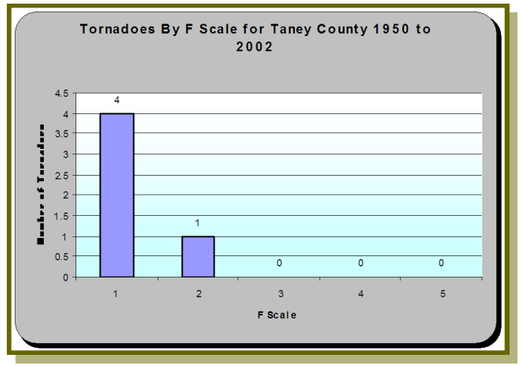
Taney County lies at the eastern edge of tornado ally and receives on average a tornado every seven years. From 1950 to 2008 Taney county recorded 7 tornadoes from F0 to F2 in strength. The strongest tornado, an F2, passed across the county on the evening of May 21st, 1957. Along its 15 mile track it caused 25 Thousand dollars in damage.

Historical Tornadoes of Taney County

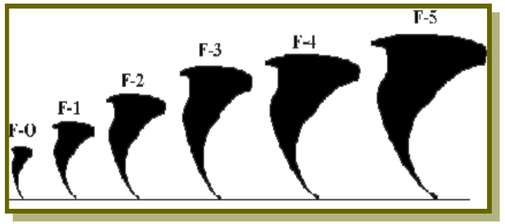
- Apr 18, 1880 (F?) 0 inj, 2 dead
- Jan 11, 1898 (F2) 5 inj, 1 dead
- Mar 11, 1920 (F4) 30 inj, 10 dead
- Apr 12, 1945 (F3) 1 inj, 0 dead
- Mar 30, 1948 (F2) 0 inj, 0 dead
- May 21, 1957 (F3) 0 inj, 0 dead
- Mar 5, 1961 (F2) 0 inj, 0 dead
- Apr 5, 1965 (F1) 0 inj, 0 dead

For the Record Taney County

- Has experienced one F4 tornado.
- No F5 tornadoes
- Most recent Tornado January 8, 2008 (F0)
- 13 deaths and 36 injuries since 1880.

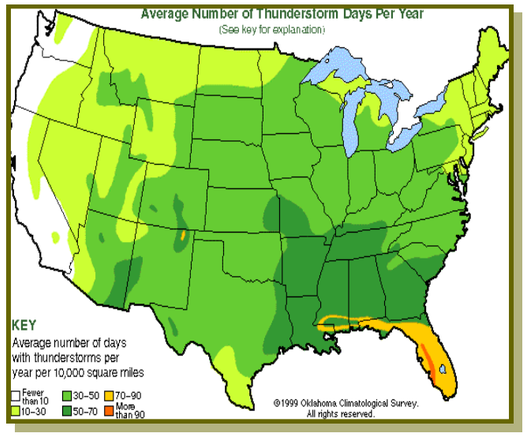


The tornado outbreak of May 4, 2003 was the one of the worst that southwest Missouri has had since the late 1800's. Fourteen tornadoes touched down across the Ozarks during the evening of May 4th one of which was an F3 that struck the town of Battlefield in Greene county.



- **F-0:** 40-72 mph, chimney damage, tree branches broken
- **F-1**: 73-112 mph, mobile homes pushed off foundation or overturned
- **F-2**: 113-157 mph, considerable damage, mobile homes demolished, trees uprooted
- **F-3**: 158-205 mph, roofs and walls torn down, trains overturned, cars thrown
- **F-4**: 207-260 mph, well-constructed walls leveled
- **F-5**: 261-318 mph, homes lifted off foundation and carried considerable distances, autos thrown as far as 100 meters.

Severe Hail, Lightning, Wind and Winter Weather



Average number of thunderstorm days per year.

Thunderstorms occur in the Ozarks on the average of 50 days per year.

April and May are the two most active hail months in the Ozarks. There is also evidence of a minor secondary peak in September. The greatest number of hail reports over 2 inches occur in the months of April, May and June with the largest report being 1.75 inches in diameter in Taney county on April 24, 2003. Hail can cause considerable damage to homes, vehicles, and crops.

Severe thunderstorm winds are defined by the NWS as convective wind gusts that reach or exceed 50 knots (58 mph). June is the most active month with April a close second. In general, the most active period for damaging wind events occurs from April to August. This is due in part to the shift from supercell thunderstorms to large clusters of storms and squall lines. The highest wind gust recorded in Taney county reached 100 mph and occurred in 1972 on the 13th of April. Since 1968 high winds have caused around $609,000.00 in damages.

With any thunderstorm, lightning will be present and the safest place to be is indoors. In August of 2002, four people were killed near Willard in Greene County during a funeral. As a thunderstorm moved into the area, the victims sought shelter under a tree.

Nationally, Missouri ranks 27th in Lightning fatality rate, 44th in injuries and 38th in property damage related to lightning. During the period from 1960 to 1994, the total number of lightning casualties in Missouri was 165. This is nearly five casualties per year in the state.

Winter weather across the Ozarks comes in many forms. Freezing rain or drizzle, sleet and snow are common occurrences during the winter season. In the past the Ozarks have had up to 54 inches of snow, Sleet storms that produced inches of sleet and ice storms that laid a covering of one to two inches of ice on most surfaces. While the immediate impact of theses storms is to travel, winter storms cause hundreds of thousands of dollars in damages across the region on a near yearly basis.

21 Feb 2001: Sleet, freezing rain and embedded thunderstorms caused ice accumulations from one quarter, up to two inches in places across southwest, central and south central Missouri. The heaviest ice accumulations occurred along and north of Highway 60, and along the I-44 corridor. Howell-Oregon electric cooperative reported numerous power outages due to the ice around the communities of Willow Springs, Birch Tree, Mountain View, Winona, Eminence and Dora.

Flooding

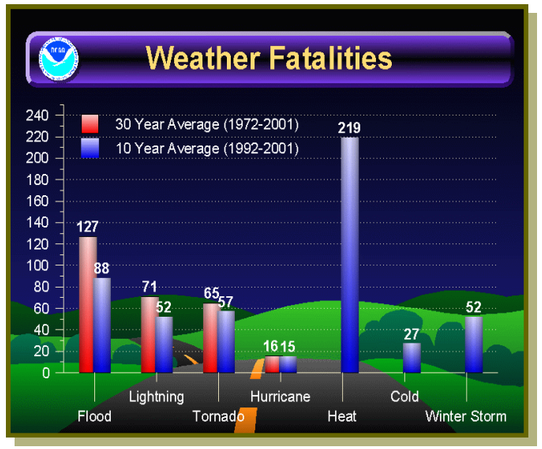
From 1993 to 2002 Flooding has occurred in Taney County in every year. While usually nuisance flooding such as water on city streets, significant flooding has caused numerous problems in the county. During the previous decade, only one injury and no deaths have been attributed to flooding in Taney County. Taney County contains numerous low water crossings.

Typically, flooding in the county is caused by heavy rainfall associated with high rain producing thunderstorms which move very slowly. In towns, rainfall of one to two inches will cause streets and ditches to flood and make some low water crossings impassable. When rainfall rates reach 3 to 4 inches, major flooding can occur, and amounts over four inches creates significant flooding that affects most of the county.

Floods in Taney County

28 Sept 2001: Numerous low water crossings were flooded and impassable across northern Taney County, especially around Taneyville and Bradleyville. One street was washed out northeast of Taneyville on Highway AA.

4 Jan 1998: Widespread heavy rainfall occurred over much of extreme southern Missouri from the late morning hours of Sunday January 4th into the early morning hours of Monday January 5th. Widespread rain totals of one to three inches occurred with locally higher amounts in the Branson area. This rain falling on saturated ground caused



National Weather Fatality Statistics

Widespread flooding of low water crossings. Many highways that cross low water crossings or creeks were temporarily closed in the region. No serious damage or accidents were reported.

9 May 1998: Rainfall in excess of three inches caused flooding of numerous low water crossings and low lying areas in the Branson area. Roark Road was flooded, Shepard of the Hills Expressway was flooded by the charcoal plant, and Fall Creek Road was flooded by Thousand Hills Golf Course.

28 Jul 2000: Thunderstorms produced heavy rainfall of 2 to 4 inches, with rainfall rates of 2 inches per hour in some locations. Widespread street flooding occurred in south Springfield, with water as deep as 3 feet near Battlefield Mall. In Christian County, street and residence flooding occurred in Clever. Elsewhere, the flooding was mainly confined to low water crossings.