

South Dakota's Climate

THE COCORAHS 'STATE CLIMATES' SERIES

South Dakota: The Land of Infinite Variety

By Dennis Today, State Climatologist

The land of infinite variety is a common phrase used in South Dakota. But when talking about the climate this is a good description. Located in the northern High Plains, the state exhibits the extremes of continentally, ranging from very warm in the summer to very cold in the winter. The range from record high (120 F) to record low (-58 F) is one of the largest of the 50 states. Average temperatures range from highs in 80s to low 90s mid-summer to lows in the single digits to below zero F in the winter months. Precipitation ranges from an average of 26" in the southeast to 14" in the northwest with an anomaly over the Black Hills, the average wettest area of the state.

The state's climate ranging from humid continental in the east to semi-arid in the west makes South Dakota a natural for growing various agricultural crops. Areas east of the Missouri River are more Midwestern-like where corn and soybeans grown. Wheat and other small grains are grown in the northern and central part of the state. But approaching the 100th meridian roughly along the Missouri River, and points west, more land is in grass and rangeland because soils are generally less fertile and precipitation is generally lower.

The state is home to several well known extremes. In the town of Spearfish (located on the edge of the Black Hills in western South Dakota), a back and forth battle of warm and cold air masses led to the greatest temperature change ever recorded in North America. On January 22, 1943, the temperature at 7:30 a.m. was -4F. Two minutes later, the temperature shot up to 45F. By 8:45 a.m., the temperature reached at 55F - before plummeting back to 0F forty-five minutes later. The wild temperature swing presented motorists with visibility problems as their windshields instantly frosted when they drove into the cold zone. Plate glass windows cracked, and many pine trees were damaged by the rapid freezing and thawing.

Though on the north end of Tornado Alley, South Dakota does receive a fair amount of severe weather. On the evening of June 24, 2003 between 5 pm and 11 pm, sixty-seven tornadoes touched down in that 6-hour period, equaling Texas' Hurricane Beulah outbreak for the single-day, single-state record tornado occurrence. The most powerful of the South Dakota tornadoes was a heavily photographed, slow-moving F-4 wedge that tore up the town of Manchester.

In contrast, liquid precipitation of catastrophic proportions fell over the Black

Hills on June 9, 1972. An estimated 10 to 15 inches of rain fell in six hours, leading to the failure of the Canyon Lake Dam in western Rapid City. During the night, floodwaters raced down Rapid Creek at a rate in excess of 50,000 cubic feet per second one thousand times the creek's normal flow and roared into the central part of the city, sweeping away homes and cars as it went. The torrent killed 238 people and injured three thousand others.

The state is also now the home to country's heaviest and largest diameter hailstone. The Vivian hail stone from July 23, 2010 weighed in at 1 lb 15 oz and was 8" in diameter. Several hundred cars were damaged along I-90 as the storm passed over. Many roofs were severely damaged in the small town.

For more South Dakota Climate information visit: <http://climate.sdstate.edu>.

To learn more about the "Climates of our Fifty States" and view past state climate messages, visit our [50 States Climate Page](#).

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