La Niña Winter Temperatures in the Upper Mississippi River Valley

Since the winter of 1949-50, La Niñas have been ongoing during twenty-one meteorological winters (December through February). The table below and continued on the next page contains the average temperatures during these winters for 39 locations across northeast Iowa, southeast Minnesota, and western Wisconsin. It also compares this data to the long-term (1949-2011) average of 18.5F. In all of these locations, the average La Niña winter temperature was colder (a tenth to 1.2F degrees) than the long-term average. The blue boxes indicate that the La Niña winter was colder than the long-term average. The red boxes indicate that the La Niña winter was warmer than the long-term average. The yellow boxes indicate that the La Niña winter was the same as the long-term average. Finally, the green boxes indicate that there was no data for that location for that winter. The La Niña strength greatly influences the temperatures across the United States. During weak and moderate La Niñas, temperatures are typically cooler than normal across Alaska and from the Pacific Northwest east into the Upper Mississippi River Valley. Meanwhile, warmer-than-normal temperatures are typically found across the southern United States and Mid-Atlantic States. When a La Niña is strong, temperatures are typically warmer than normal across most of the eastern two thirds of the United States and cooler than normal along the west coast of the United States.

City	State	1949-1950	1950-1951	1954-1955	1955-1956	1956-1957	1962-1963	1964-1965	1967-1968	1970-1971	1971-1972	1973-1974	1974-1975	1975-1976	1984-1985	1988-1989	1995-1996	1998-1999	1999-2000	2000-2001	2007-2008	2010-2011	La Niña Average	Long Term Avg. (1949-2011)	Difference (Long Term Avg. - La Niña Avg.)
Charles City	IA	18.4	14.2	21.6	17.6	22.2	14.7	15.7	21.0	15.6	16.9	18.5	20.5	24.6	18.2	19.6	18.7	23.6	24.5	14.1	15.4	15.5	18.6	19.4	-0.8
Cresco	IA	18.7	14.5	M	16.4	20.2	12.8	14.8	19.7	14.6	13.7	15.7	18.6	20.3	13.9	16.9	14.4	21.6	21.2	11.8	12.8	14.3	16.3	17.0	-0.7
Decorah	IA	18.4	14.3	20.0	16.1	21.6	14.5	15.9	21.2	15.5	16.1	17.5	19.7	22.2	17.4	21.2	17.8	25.1	24.3	15.1	16.6	17.2	18.5	19.5	-1.0
Elkader	IA	19.9	16.4	21.8	19.5	22.9	15.7	17.8	M	17.8	19.7	20.2	20.8	25.0	18.5	22.4	19.2	25.3	25.3	16.5	15.0	14.6	19.7	20.4	-0.7
Fayette	IA	20.2	15.0	19.9	17.8	20.9	14.4	16.4	21.1	15.6	17.3	18.6	20.8	23.9	17.9	21.0	16.0	22.0	21.6	13.0	14.6	12.0	18.1	18.9	-0.8
Guttenberg Lock & Dam 10	IA	23.8	18.3	22.9	20.9	24.6	16.7	19.5	23.2	18.1	19.8	21.9	24.1	26.0	20.6	24.1	19.8	26.7	26.5	17.3	18.9	18.9	21.6	22.0	-0.4
New Hampton	IA	15.5	13.5	19.7	17.0	20.3	M	15.8	20.4	15.8	17.3	18.7	20.4	23.8	18.5	20.4	17.7	23.3	24.2	13.8	13.2	13.8	18.2	18.8	-0.6
Oelwein	IA	21.6	16.5	M	18.7	22.1	14.6	17.2	21.0	M	18.3	M	M	24.5	19.2	20.8	17.8	23.9	23.7	13.7	14.6	14.2	19.0	19.6	-0.6
Osage	IA	18.0	13.4	19.5	15.2	20.3	14.3	15.1	20.9	15.6	16.0	17.9	20.4	23.0	17.2	20.9	18.4	22.7	22.9	12.4	13.6	13.8	17.7	18.4	-0.7
Waukon	IA	19.7	15.4	19.6	16.9	20.0	M	M	20.3	15.7	16.9	18.5	20.3	23.3	16.6	19.1	16.2	M	22.6	13.6	14.5	15.2	18.0	18.7	-0.7
Austin	MN	15.3	12.0	17.2	11.6	19.1	12.0	13.4	M	13.3	12.3	16.4	M	22.7	15.6	22.7	14.8	20.4	20.1	10.2	12.2	12.5	15.5	16.7	-1.2
Caledonia	MN	M	M	M	M	M	11.9	12.5	19.7	15.1	15.7	17.7	19.5	20.7	14.8	17.9	15.6	M	22.4	13.0	13.8	15.1	16.4	16.8	-0.4
Grand Meadow	MN	15.5	10.8	16.2	11.8	17.3	12.1	12.3	16.9	11.9	12.7	14.4	17.8	19.4	14.0	16.8	14.1	19.9	19.9	10.2	12.0	12.1	14.7	15.7	-1.0
Preston	MN	M	M	19.3	14.5	21.0	15.2	13.2	17.9	14.3	M	17.6	19.7	21.3	15.7	M	14.2	21.5	21.6	12.6	13.7	14.7	16.9	17.7	-0.8
Rochester	MN	15.2	11.3	17.5	12.8	18.3	12.1	12.3	17.1	13.3	13.0	14.5	17.5	21.0	14.7	17.0	14.9	20.8	21.3	11.6	14.7	14.6	15.5	16.5	-1.0
Theilman	MN	M	M	M	M	M	12.4	M	19.2	13.8	13.4	16.3	19.1	22.4	16.9	17.3	M	M	20.0	11.0	12.3	12.8	15.9	17.6	-1.7
Winona	MN	19.0	15.4	19.4	14.9	18.6	13.6	14.0	20.4	13.0	14.3	16.2	18.1	18.5	18.2	22.4	18.3	25.8	25.7	17.0	17.5	15.3	17.9	19.2	-1.3
Alma Dam	WI	16.9	13.7	20.4	17.1	21.2	14.8	15.6	20.8	15.8	15.9	18.7	20.7	20.1	16.6	20.5	16.6	23.8	23.9	15.9	16.9	17.2	18.2	19.3	-1.1
Blair	WI	17.1	13.6	18.4	16.0	19.1	13.6	14.1	18.7	13.3	15.3	14.4	17.5	17.6	14.7	16.3	13.9	20.7	20.6	13.4	12.7	14.9	16.0	16.8	-0.8

City	State	1949-1950	1950-1951	1954-1955	1955-1956	1956-1957	1962-1963	1964-1965	1967-1968	1970-1971	1971-1972	1973-1974	1974-1975	1975-1976	1984-1985	1988-1989	1995-1996	1998-1999	1999-2000	2000-2001	2007-2008	2010-2011	La Niña Average	Long Term Avg. (1949-2011)	Difference (Long Term Avg. - La Niña Avg.)
Cashton	WI	19.4	15.5	18.0	16.9	18.1	12.3	M	M	14.9	16.1	M	20.3	20.8	M	M	16.3	22.9	24.2	15.4	15.4	M	17.8	18.7	-0.9
Dodge	WI	M	M	M	M	M	12.7	14.2	M	13.0	14.8	16.6	20.8	20.9	15.9	21.1	M	M	M	M	15.8	16.7	16.6	17.9	-1.3
Genoa Dam 8	WI	22.2	16.3	22.4	18.8	23.0	15.8	17.4	21.3	16.1	17.6	19.3	21.5	23.5	17.8	22.0	17.7	25.1	25.7	16.9	17.9	18.1	19.8	20.7	-0.9
Hatfield	WI	16.7	12.8	18.4	M	18.2	12.4	13.4	17.4	13.3	14.1	16.7	18.9	18.5	16.4	18.3	19.9	M	M	M	12.9	M	16.1	16.8	-0.7
Hillsboro	WI	20.8	16.1	30.6	19.2	20.9	11.8	14.9	20.1	15.2	18.0	M	21.6	M	16.4	19.0	15.1	23.0	23.3	15.5	16.2	15.0	18.6	19.0	-0.4
La Crosse	WI	20.3	15.0	20.0	16.1	20.5	14.2	14.2	21.4	14.5	17.3	18.7	21.2	21.8	16.3	19.8	17.5	24.6	25.3	15.2	16.3	16.9	18.4	19.5	-1.1
Lancaster	WI	22.6	17.8	22.1	19.8	22.3	15.1	18.3	21.4	18.0	19.3	20.6	22.8	23.8	17.8	20.4	17.4	23.8	23.3	14.8	15.0	16.9	19.7	20.1	-0.4
Lynxville Dam 9	WI	21.6	16.6	22.1	17.4	22.6	15.7	18.3	23.1	17.7	19.7	20.9	23.2	24.4	19.7	22.5	18.6	26.0	26.1	17.4	18.3	19.2	20.5	21.3	-0.8
Mather	WI	16.0	14.6	18.0	15.2	17.1	11.4	13.5	17.5	14.1	14.1	M	M	17.6	14.9	18.4	14.1	21.2	21.2	13.1	13.0	15.0	15.8	17.0	-1.2
Mauston	WI	M	M	18.6	18.6	20.7	14.0	16.2	20.2	16.1	18.1	19.2	21.1	19.9	17.0	20.2	16.2	24.0	24.1	16.0	16.4	17.1	18.6	19.5	-0.9
Medford	WI	14.5	12.7	14.9	13.7	14.9	9.5	10.8	15.0	11.4	10.0	13.0	16.5	15.0	12.1	12.3	10.6	17.7	17.5	11.1	11.5	12.5	13.2	14.3	-1.1
Mondovi	WI	15.8	13.8	17.8	M	18.1	M	13.2	18.7	13.2	13.6	17.6	19.8	20.1	16.0	18.8	16.3	23.3	23.0	15.6	15.2	14.9	17.1	17.9	-0.8
Necedah	WI	M	M	17.8	14.9	17.2	12.0	13.6	17.0	14.7	14.7	18.6	20.5	19.5	18.1	20.4	16.5	23.7	24.4	16.5	15.1	M	17.5	18.6	-1.1
Neillsville	WI	13.9	10.8	17.2	13.5	16.2	10.4	11.9	17.0	13.3	13.1	16.1	18.9	17.6	15.3	16.9	14.8	19.0	20.3	12.3	12.8	14.1	15.0	16.3	-1.3
Owen	WI	11.6	8.7	13.8	10.2	12.2	7.3	8.4	13.7	11.1	9.4	12.9	16.0	13.8	12.1	12.7	10.7	18.6	18.1	12.1	11.4	11.1	12.2	13.5	-1.3
Platteville	WI	23.7	18.5	22.3	20.9	22.8	15.4	18.9	22.3	18.5	20.2	21.0	23.4	24.9	20.1	23.2	18.1	24.7	23.9	15.6	16.5	M	20.7	21.1	-0.4
Prairie du Chien	WI	23.5	18.1	23.0	20.1	23.5	16.0	17.6	22.9	18.2	20.0	21.7	24.0	25.7	21.0	24.2	20.3	26.4	24.5	16.1	16.3	17.4	21.0	21.8	-0.8
Richland Center	WI	22.9	16.4	21.6	19.8	22.7	15.1	18.4	21.3	17.1	19.6	20.9	23.2	24.1	17.9	20.7	16.7	24.0	25.0	16.5	15.3	16.7	19.8	20.2	-0.4
Sparta	WI	18.9	14.0	20.1	17.1	20.5	13.3	15.4	20.1	14.8	16.5	18.1	20.5	M	15.7	M	15.8	22.7	23.1	15.2	15.3	15.8	17.5	18.5	-1.0
Trempealeau Dam 6	WI	17.6	14.5	24.5	15.2	21.2	14.1	15.1	20.7	15.3	16.7	18.4	20.6	21.8	17.9	20.4	16.7	24.1	24.6	16.0	16.9	18.0	18.6	19.5	-0.9
All Site Average		18.6	14.6	19.9	16.5	20.1	13.4	15.0	19.7	15.0	16.0	17.8	20.3	21.5	16.8	19.7	16.4	23.0	23.0	14.3	14.8	15.3	17.7	18.5	-0.8

The table on the next page compares the La Niña strength with the average winter temperature for 39 locations across northeast Iowa, southeast Minnesota, and western Wisconsin. It shows that the weak and moderate La Niñas averaged about 1.5 degrees colder than the long-term average during 75 percent (12 out of 16) La Niña winters. Meanwhile, all five of the strong La Niña winters were warmer (average 1.6 degrees) than the long-term average.

La Niña Strength Compared to Average Winter Temperature

	La Nina Average Temperature	Long-Term (1949-2011) Average Temperature	Diff	Min	Max	# Below the 1949-2011 Average	# Above the 1949-2011 Average	Total	% Below the 1949-2011 Average	% Above the 1949-2011 Average
Weak (9 Winters)	16.9	18.5	-1.6	13.4	20.3	7	2	9	77.8	22.2
Moderate (7 Winters)	17.0	18.5	-1.5	14.6	23.0	5	2	7	71.4	28.6
Strong (5 Winters)	20.1	18.5	1.6	20.1	23.0	0	5	5	0.0	100.0

Weak La Niña (Oceanic Niño Index -0.5 to -0.9) Winters: 1956-57, 1962-63, 1964-65, 1967-68, 1971-72, 1974-75, 1984-85, 1995-96, and 2000-01.
Moderate La Niña (Oceanic Niño Index -1.0 to -1.4) Winters: 1950-51, 1954-55, 1955-56, 1970-71, 1998-99, 2007-08, and 2010-11.
Strong La Niña (Oceanic Niño Index less than -1.5) Winters: 1949-50, 1973-74, 1975-76, 1988-89, and 1999-2000.