U. S. DEPARTMENT OF COMMERCE, WEATHER BUREAU
IN COOPERATION WITH MADISON FRONTLINERS,
INDUSTRIAL DEVELOPMENT COMMITTEE, CHAMBER OF COMMERCE

CLIMATOGRAPHY OF THE UNITED STATES NO. 20 — 12

LATITUDE 38° 44' N.
LONGITUDE 85° 24' W.
ELEV. (GROUND) 455 Ft.

CLIMATOLOGICAL SUMMARY

STATION MADISON, INDIANA

MEANS AND EXTREMES FOR PERIOD 1927-1956

Month	Temperature (°F) Means: Daily maximum	Daily minimum	Monthly	Extremes: Record highest	Year	Record lowest	Year	** Mean degree days	Precipitation Totals (Inches): Mean	Greatest daily	Year	Snow, Sleet: Mean	Maximum monthly	Year	Greatest daily	Year	Mean number of days: Precip. .10 inch or more	Temperatures: Max. 90° and above	Max. 32° and below	Min. 32° and below	Min. 0° and below	Month
(a)	30	30	30	30		30			30	30		30	30		30		30	30	30	30	30	
Jan.	44.3	25.6	35.0	73	1944	-12	1940	930	4.28	3.55	1937	3.3	19.0	1956	13.2	1956	8	0	5	23	1	Jan.
Feb.	48.0	27.2	37.6	81	1932	-12	1951	770	3.34	2.37	1955	2.5	13.5	1948	5.0	1940	6	0	2	20	*	Feb.
Mar.	57.2	33.7	45.5	91	1929	1	1943	600	4.93	2.94	1945	1.8	14.9	1951	5.0	1947	9	*	*	16	0	Mar.
Apr.	68.6	43.3	56.0	93	1942+	21	1950+	290	4.18	2.95	1942	T	2.0	1953	2.0	1953	8	*	0	4	0	Apr.
May	78.7	52.8	65.8	100	1939	30	1940	90	4.33	4.16	1927	T	T	1929	T	1929	8	4	0	*	0	May
June	87.1	62.1	74.6	107	1944	39	1930	0	4.26	3.63	1949	0	0		0		7	13	0	0	0	June
July	91.1	65.9	78.5	110	1936	49	1947	0	3.43	2.72	1938	0	0		0		6	19	0	0	0	July
Aug.	90.0	64.3	77.2	108	1936	46	1946	0	3.45	3.23	1944	0	0		0		6	18	0	0	0	Aug.
Sept.	84.5	57.2	70.9	108	1953	32	1928	40	3.08	1.97	1954	0	0		0		6	9	0	*	0	Sept.
Oct.	73.9	46.2	60.1	100	1939	20	1937	200	2.70	3.88	1955	T	T	1949+	T	1949+	5	1	0	2	0	Oct.
Nov.	57.1	35.4	46.3	88	1950	0	1950	560	3.39	2.69	1948	0.9	5.9	1950	4.0	1950+	7	0	1	13	*	Nov.
Dec.	46.2	27.5	36.9	73	1956+	-5	1932	870	3.06	3.17	1948	3.2	12.4	1935	7.0	1935	6	0	4	21	*	Dec.
Year	68.9	45.1	57.0	110	1936	-12	1951+	4350	44.43	4.16	1927	11.7	19.0	1956	13.2	1956	82	64	12	99	1	Year

(a) Average length of record, years.

T Trace, an amount too small to measure.

** Base 65°F. and computed from monthly mean temperatures.

+ Also on earlier dates, months, or years.

* Less than one half.

CLIMATE OF MADISON, INDIANA

Madison has an invigorating climate because of its location in the middle latitudes and away from the influence of oceans. The zone of conflict between polar air and tropical air moves back and forth across the locality resulting in rainfall and frequent changes of temperatures and humidity. Madison is on the warm side of this undulating boundary in the summer and on the cold side in the winter most of the time. Surges of polar air toward the south and tropical air toward the north cause low pressure centers to form and move across the plains, up the Ohio River Valley and St. Lawrence River Valley to the Atlantic. Most of Madison's rainfall comes from these storms.

Thunderstorms accompany most of the summer rainfall and occur when potential energy aloft is triggered by a change in moisture and temperature conditions. This phenomenon is related to hot humid days and night time cooling. Days with thunderstorms average about eight a month in the summer and about two a year occur during the winter months.

Relative humidity data are not available but estimates are possible. Relative humidity varies on an average summer day from about 40 during a typical summer afternoon to 90 and higher just before dawn. Relative humidity rises and falls much as temperature does during a 24-hour period but the highest percent usually occurs with the minimum temperature and the lowest percent with the maximum temperature. In the winter the most probable range of humidity from afternoon to night is from the 60's to the 90's. Fog is a visible indicator of humidities in the high 90's to 100 percent.

An average day has a greater range of temperature in the summer than in the winter. The table shows that winter days have a daily temperature range of 20 degrees while in the summer the range is 25 degrees. Temperatures in January varied 85 degrees; the range in August was 62 degrees.

Prevailing winds are out of the south or southwest all seasons of the year.

Rainfall intensities at Madison, based on the statistical treatment of rainfall data, indicates that the probability of 1.2 inches of rain in one hour is about once in two years, and 2.0 inches in one hour about once in 25 years. In a 6-hour period 1.9 inches is expected once in 2 years, 2.7 inches in a 10 year period and 3.1 inches once in 25 years. In a 24-hour period expect 4.6 inches once in 10 years and 5.3 inches once in 25 years.

Precipitation is least in the fall and greatest in the spring. March rainfall averaged the highest of the other months because of outstanding wet Marches in 1935 (10.21 inches) and in 1945 (12.52 inches). If the most usual value was selected (the median) the month would be comparable to other spring months. July is the warmest month of the year. An average July has 19 days of temperatures 90 degrees or higher. January is the coldest. The winter season averages 1 day with minimum temperatures below zero.

Snowfall has occurred as early as October and as late as May. The most snow comes in January. The greatest snowfall of any one day occurred January 19, 1956 when 13.2 inches were recorded.

Degree day data are provided as an index of heating requirements for dwellings. Fuel consumption for heating is proportional to degree day summations. A month with twice the heating degree days of another month would require twice as much fuel for heating. Degree days for a single day are obtained by subtracting the mean temperature from 65. The need for the heating of buildings is considered none or slight if a day has an average temperature of 65 or higher.

The Ohio River occasionally floods properties along the river. The greatest flood of record was January 27, 1937 when the river gage recorded a crest of 72.3 feet above the zero of the gage. The zero of the gage is 403.20 feet above mean sea level. The next three highest river stages of record and dates of occurrence are: 61.8 feet on February 15, 1884, 61.5 feet on March 8, 1945, and 60.5 feet on February 1, 1913. Flood stage is considered to be 46 feet.

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Average Temperature (°F)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Ann'l
1927	33.6	42.8	47.8	57.0	77.2	70.2	76.6	70.4	72.6	60.8	50.6	36.0	57.0
1928	33.4	35.6	43.5	51.8	63.0	69.4	77.2	77.6	66.2	62.4	46.8	39.2	55.5
1929	32.1	30.8	51.8	59.6	63.5	72.0	77.0	74.4	69.2	56.4	42.5	36.4	55.0
1930	32.9	43.8	43.0	58.2	66.8	73.1	81.0	77.4	71.3	55.4	45.5	34.2	56.9
1931	36.3	40.4	40.2	55.2	63.0	76.0	80.8	76.3	74.4	61.0	53.2	43.8	58.4
1932	42.4	44.6	39.1	55.1	65.7	74.7	79.8	77.2	70.8	57.8	43.6	36.0	57.2
1933	42.2	36.8	45.0	55.0	68.4	78.7	78.2	76.1	75.3	58.3	44.2	41.0	58.2
1934	38.5	29.6	42.1	56.0	68.3	77.6	82.0	75.8	69.8	59.8	50.2	35.2	57.1
1935	35.6	37.7	52.1	53.4	61.2	69.1	78.7	77.0	68.3	60.2	46.8	29.1	55.8
1936	27.3	29.8	49.6	51.6	68.6	76.2	83.0	83.2	74.1	58.2	41.6	38.4	56.8
1937	40.4	37.0	41.6	55.6	64.9	74.0	75.1	79.2	68.0	56.3	43.4	34.6	55.8
1938	35.2	44.9	51.4	59.8	68.8	73.7	77.2	78.6	72.4	61.6	49.1	38.0	59.2
1939	39.4	38.8	48.4	56.8	71.0	79.4	79.8	79.2	78.0	63.6	45.8	41.2	60.2
1940	20.0	35.4	43.9	53.8	62.7	73.8	77.8	79.2	67.6	62.4	46.1	42.8	55.4
1941	35.8	33.2	40.4	60.4	68.8	75.0	78.5	78.0	74.5	64.4	47.2	42.2	58.2
1942	32.6	32.8	48.8	59.6	66.8	76.0	79.5	76.7	70.0	59.8	49.6	34.2	57.2
1943	36.6	38.6	42.6	54.0	67.2	79.0	79.8	79.8	68.4	59.0	45.3	35.0	57.2
1944	36.8	41.1	44.5	56.3	72.0	78.7	79.2	77.6	70.0	59.0	48.2	32.2	58.0
1945	29.6	37.0	56.0	58.4	61.6	72.2	76.1	76.2	73.0	57.6	48.0	30.6	56.4
1946	36.4	41.2	56.6	58.6	63.8	74.2	77.0	71.8	69.7	61.4	51.7	41.0	58.6
1947	40.4	29.8	38.6	57.4	63.0	72.4	72.8	81.4	71.8	66.4	44.0	37.1	56.2
1948	26.6	37.4	49.4	60.5	64.8	74.2	77.4	76.1	71.6	57.2	49.8	39.5	57.0
1949	41.0	39.8	44.1	54.4	66.6	76.0	81.7	77.5	65.5	63.3	45.6	--	---
1950	--	36.6	41.0	50.8	65.7	71.6	73.8	72.9	67.1	62.3	40.2	29.1	---
1951	34.2	33.9	41.2	51.9	65.9	73.3	77.3	76.4	68.1	60.2	38.8	35.3	54.7
1952	38.4	39.1	43.7	55.0	64.5	79.2	80.5	77.2	70.3	53.6	47.2	--	---
1953	37.2	39.8	45.4	50.9	68.1	78.3	78.5	78.3	72.1	61.8	46.1	36.0	57.7
1954	34.5	43.7	42.3	--	60.4	76.6	81.3	78.2	74.0	--	46.2	36.4	---
1955	32.8	35.6	--	60.7	67.2	69.1	81.4	80.1	73.2	58.3	43.7	33.6	---
1956	32.1	39.9	44.4	52.1	64.9	73.7	76.8	75.3	67.7	63.0	45.5	43.5	56.6
1957	30.6	41.0	45.4	58.5	67.6	75.2	--	--	--	--	--	--	---

Total Precipitation (Inches)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Ann'l
1927	5.70	1.16	5.62	5.23	10.37	2.08	3.04	5.56	3.14	3.03	5.81	4.98	55.72
1928	2.25	3.80	2.59	4.17	3.76	10.50	3.48	3.50	0.82	4.69	3.69	3.11	46.36
1929	4.41	2.18	3.09	5.76	9.22	5.84	6.61	3.48	4.92	4.58	4.88	2.95	57.92
1930	5.24	3.68	1.53	2.10	0.95	0.69	0.86	1.17	6.04	1.12	1.45	2.23	27.06
1931	1.15	2.26	3.75	4.21	2.17	3.27	2.97	6.32	4.78	4.19	4.49	3.84	43.40
1932	7.62	2.80	3.32	3.48	0.96	5.50	5.52	4.57	4.18	2.82	3.00	5.63	49.40
1933	7.07	2.63	8.28	7.24	9.06	0.23	3.06	2.11	5.11	1.87	1.74	3.03	51.43
1934	1.46	0.92	3.44	1.13	1.09	7.06	0.81	5.01	3.86	0.49	1.67	1.78	28.72
1935	5.13	0.95	10.21	3.68	6.91	3.69	4.04	4.42	2.05	2.84	1.93	2.40	48.25
1936	1.52	2.30	4.41	3.54	1.96	0.21	3.24	1.81	3.70	3.84	3.26	2.84	32.68
1937	17.83	2.03	1.34	4.09	3.43	4.52	3.63	3.35	4.28	4.10	2.52	3.71	54.83
1938	2.67	2.60	6.20	2.54	6.35	1.78	7.37	5.16	2.75	0.36	3.39	1.39	42.56
1939	5.00	6.34	7.92	7.00	1.18	9.00	3.25	1.21	1.24	1.75	1.56	1.92	47.37
1940	1.74	4.73	4.36	7.35	2.58	3.72	0.73	3.55	1.32	0.65	3.96	2.62	37.31
1941	2.23	0.68	1.11	2.71	1.23	9.13	5.90	1.21	1.77	5.59	2.76	3.15	37.47
1942	2.78	2.63	5.09	4.06	4.20	5.09	3.57	3.96	2.94	1.17	5.03	4.54	45.06
1943	0.55	2.69	7.42	3.37	4.41	2.67	3.74	0.09	1.11	1.36	0.96	1.42	29.79
1944	1.28	4.22	6.12	5.33	3.71	0.64	2.61	9.77	3.24	0.47	3.14	3.03	43.56
1945	2.54	5.96	12.52	4.63	4.38	4.42	3.26	2.67	4.97	2.58	4.52	2.03	54.48
1946	2.03	5.02	4.67	2.09	6.60	3.95	3.92	6.07	1.39	3.05	5.00	3.10	46.89
1947	5.30	0.24	2.05	8.27	7.72	7.06	4.06	2.67	3.81	2.43	2.50	1.63	47.74
1948	2.66	4.03	5.44	6.85	2.95	3.21	3.01	2.23	0.75	2.38	7.86	5.23	46.60
1949	10.52	3.11	5.91	2.06	1.89	8.41	0.89	4.37	1.38	3.75	0.94	--	---
1950	--	7.02	3.59	5.34	6.63	4.31	5.57	3.62	4.20	2.42	6.90	2.64	---
1951	6.88	4.33	5.34	3.17	2.34	5.66	1.48	1.76	3.15	1.80	5.77	6.34	48.02
1952	3.65	3.95	5.04	2.72	3.40	4.47	1.98	1.35	2.81	2.20	2.83	4.40	38.80
1953	5.16	1.19	3.37	4.25	3.72	1.95	5.57	0.52	1.21	1.10	1.65	2.27	31.96
1954	3.60	1.48	2.50	3.00	2.96	1.62	0.84	5.23	2.98	5.00	1.95	3.06	34.22
1955	3.00	7.72	7.30	2.92	6.52	4.08	4.77	0.66	4.80	6.36	4.60	0.83	53.56
1956	3.11	7.52	4.37	3.06	7.23	2.95	3.24	6.05	3.74	2.91	1.99	2.62	48.79
1957	3.58	4.10	2.22	6.98	5.59	6.41	--	--	--	--	--	--	---

STATION HISTORY

For many years Madison was fortunate in having a citizen, Mr. M. E. Garber, who recorded weather data from November 12, 1925 to September 12, 1956. The instruments were located at the home of the observer. The elevation was 486 feet, latitude 38° 44' N. and longitude 85° 23' W. On April 26, 1957 the station was moved to the sewage plant, 1 mile west-southwest of the Madison post office, after a temporary location at the office of the Madison Courier.

Earliest records are those of November 1854-July 1866. William P. Gosnell was the observer from April 1, 1893 to January 31, 1902; J. Cooperider from February 1, 1902 to May 31, 1911; and Miss F. Cooperider from June 1, 1911 to November 31, 1925. Thermometers and a raingage were located at the homes of these observers. The elevation given at these locations was 460 feet, latitude 38° 41' N. and longitude 85° 20' W.

EXTREMES AND DATE OF OCCURRENCE FOR PERIOD OF 1893-1956

Month	Record Daily Temperature Highest		Lowest		Precipitation Greatest Daily		Snowfall Greatest Monthly	
Jan.	73	27/1944+	-17	21/1918	4.10	7/1895	24.0	1895
Feb.	81	10/1932	-20	13/1899	3.35	22/1897	22.3	1914
Mar.	91	25/1929	1	3/1943	2.94	6/1945	21.0	1896
Apr.	95	23/1925	18	1/1923+	2.95	9/1942+	2.0	1953+
May	102	28/1911	30	2/1940+	4.16	9/1927	0.4	1898
June	107	28/1944	37	3/1910	3.84	1/1903		
July	110	15/1936+	49	23/1947+	4.06	13/1909		
Aug.	108	19/1936	43	31/1915	3.23	23/1944		
Sept.	108	3/1953	30	30/1899	3.13	6/1916		
Oct.	100	8/1939	17	29/1925	4.86	6/1910	5.6	1925
Nov.	88	1/1950	0	25/1950+	2.69	6/1948	5.9	1950
Dec.	73	7/1956+	-15	11/1917	3.17	15/1948	21.7	1917

DATES OF FREEZING TEMPERATURES IN SPRING AND FALL (1921-56)

Minimum Temperature	Last in Spring Earliest	Average	Latest	First in Fall Earliest	Average	Latest
32 or lower	3/12/46	4/19	5/13/38	9/26/28	10/26	11/13/46
28 or lower	3/11/46	4/4	4/28/34	10/15/37	11/5	11/23/46
24 or lower	2/27/45	3/22	4/14/40	10/20/30	11/18	12/30/21
20 or lower	2/15/46	3/8	4/1/23	10/24/37	11/25	1/30/32
16 or lower	1/15/31	2/27	3/28/34	11/3/51	12/7	1/31/32

Use of the table: The average date of the last temperature of 32 or colder in the spring is April 19. The earliest date of this event in all springs of the 1921-1956 period was March 12 in 1946. The latest date was May 13 in 1938. In the fall, 32 or colder occurred as early as September 26 (1928) and as late as November 13 (1946). The average date is October 26.

* The average date of killing frost is a few days later in the spring and earlier in the fall because temperatures on the ground are usually colder than at the standard thermometer location of 5 feet above the ground. This difference of temperature is greatest on nights when the wind is calm and the skies are clear resulting in maximum ground radiation.