U. S. DEPARTMENT OF COMMERCE, WEATHER BUREAU
IN COOPERATION WITH RICHMOND'S COMMITTEE OF 100, INC.
CLIMATOGRAPHY OF THE UNITED STATES NO. 20 — 12

CLIMATOLOGICAL SUMMARY

LATITUDE 39° 51' N.
LONGITUDE 84° 51' W.
ELEV. (GROUND) 972 Ft.

STATION RICHMOND, 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	32° and below	Temperatures Min.: 32° and below	0° and below	Month
(a)	30	30	30	30		30			30	30		30	30		30		30	30	30	30	30	
Jan.	37.7	21.3	29.5	72	1950	-17	1948+	1100	3.33	3.43	1949	4.7	12.4	1951	5.0	1939	6	0	10	26	2	Jan.
Feb.	39.9	22.2	31.1	72	1932	-13	1951+	950	2.31	1.98	1929	3.7	10.8	1929	5.7	1948	5	0	7	24	2	Feb.
Mar.	49.3	29.3	39.3	81	1939+	- 9	1943	800	3.49	2.67	1943	3.2	17.6	1951	6.5	1951	7	0	3	20	*	Mar.
Apr.	60.9	38.6	49.8	89	1930	16	1950	460	3.28	2.10	1928	.7	3.7	1931	3.7	1931	7	0	*	9	0	Apr.
May	71.5	48.5	60.0	92	1941+	29	1947+	200	3.59	2.23	1935	T	0.2	1947	0.2	1947	8	*	0	1	0	May
June	80.3	58.1	69.2	101	1934	37	1945	50	4.40	3.21	1939	0	0		0		8	3	0	0	0	June
July	84.4	61.5	73.0	103	1934	44	1930	0	3.40	3.09	1942	0	0		0		6	6	0	0	0	July
Aug.	81.7	59.5	70.1	98	1934+	39	1946	30	2.88	2.82	1934	0	0		0		6	4	0	0	0	Aug.
Sept.	78.5	52.0	65.3	97	1954	26	1928	100	3.31	2.70	1945	0	0		0		5	1	0	*	0	Sept.
Oct.	65.0	41.3	53.2	87	1939	16	1952	370	2.67	2.69	1937	T	0.6	1929	0.3	1929+	5	0	0	6	0	Oct.
Nov.	49.7	31.4	40.6	79	1950	- 1	1930	730	2.81	2.95	1955	2.5	12.0	1950	8.5	1936	6	0	2	17	*	Nov.
Dec.	39.3	23.5	31.4	69	1956	-15	1932	1040	2.49	2.39	1932	4.5	11.4	1929	6.0	1951	6	0	8	25	1	Dec.
Year	61.5	40.1	50.8	103	1934	-17	1948+	5830	37.96	3.43	1949	19.3	17.6	1951	8.5	1936	75	14	30	128	5	Year

(a) Average length of record, years.

+ Also on earlier dates, months, or years.

T Trace, an amount too small to measure.

* Less than one half.

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

CLIMATE OF RICHMOND, INDIANA

Richmond 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. Richmond 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 Richmond's rainfall comes from these storms.

Thunderstroms 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 seven 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 the 40's 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 16 degrees while in the summer the range is 22 degrees. Temperatures in January varied 89 degrees; the range in August was 59 degrees.

Prevailing winds are out of the southwest quadrant in the spring, summer, and fall but in the winter the wind blows out of the northern quadrant a majority of the time.

The record of a continuous recording raingage has been analyzed for the period of 1940-1950. In a rain storm of June 2, 1941 rainfall was 2.55 inches in one hour, 2.91 inches in 2 hours, 3.00 inches in 3 hours, 3.08 inches in 6 hours, and 3.13 inches in 12 hours. On August 16, 1944 rainfall was 2.32 inches in one hour. A rain of this size in one hour is estimated to have a probability of 1 in 25 years.

Precipitation is greatest in June and least in February. The most rain comes in late spring and early summer. The winter months are the driest. July is the warmest month of the year. An average July has 6 days of temperatures reaching 90 degrees or higher. January is the coldest. The winter season averages 5 days with minimum temperatures below zero.

Snowfall has occurred as early as October and as late as May. The most snow comes in January, however, the greatest snowfall of any one day occurred November 4, 1936 when 8.5 inches was 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.

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Average Temperature (°F)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Ann'l
1927	27.0	36.4	41.6	49.8	59.4	63.8	71.4	64.4	66.2	54.4	45.4	29.7	53.3
1928	27.6	30.1	36.8	46.5	58.0	62.9	72.0	72.3	58.6	54.7	41.4	32.9	49.5
1929	25.2	22.6	45.6	53.2	57.7	66.2	71.6	66.9	63.4	50.0	37.0	31.1	49.2
1930	25.0	39.0	37.6	52.0	61.2	68.0	73.2	70.2	64.7	49.4	41.2	30.4	51.0
1931	31.7	36.0	35.9	49.4	56.8	71.1	76.0	70.5	68.1	54.8	49.1	39.0	53.2
1932	38.2	38.2	32.2	48.8	59.8	70.6	72.5	70.0	62.8	52.0	36.8	30.6	51.0
1933	36.9	30.2	38.6	49.4	62.8	73.8	72.8	69.4	67.8	49.9	38.6	35.3	52.1
1934	33.0	20.8	34.6	48.7	62.9	74.9	77.6	70.6	63.8	52.8	44.1	29.7	51.2
1935	30.0	31.5	45.7	47.2	55.5	65.6	75.2	71.8	61.5	52.0	40.8	24.8	50.2
1936	21.9	22.0	42.8	45.8	62.2	68.0	77.2	75.2	67.0	52.3	36.6	34.0	50.4
1937	34.8	30.7	35.1	49.4	59.8	68.2	71.3	72.9	60.0	50.0	37.8	28.8	49.5
1938	28.8	37.4	45.1	51.8	60.0	66.4	71.7	72.4	64.8	52.8	42.4	32.6	52.2
1939	33.4	31.6	40.9	46.8	62.5	71.5	71.6	69.9	67.0	53.6	37.9	33.4	51.7
1940	14.8	30.4	36.1	46.7	56.6	69.5	72.2	72.3	60.4	54.4	39.5	36.2	49.1
1941	28.8	26.6	33.2	55.0	62.2	69.8	73.3	70.2	67.0	56.8	42.0	36.2	51.8
1942	27.6	27.2	42.2	53.5	61.2	70.2	73.7	70.0	62.0	53.0	43.6	27.0	51.0
1943	29.2	30.6	35.2	46.4	61.2	73.6	73.2	71.0	59.9	51.2	37.0	27.2	49.6
1944	31.0	32.4	36.2	49.4	66.0	72.2	72.8	72.1	62.9	51.4	42.2	25.8	51.2
1945	21.8	30.5	49.9	52.1	55.0	66.8	69.8	69.4	66.2	49.6	42.2	24.0	49.8
1946	29.4	32.8	50.2	50.7	57.9	68.7	71.6	65.4	63.5	55.8	44.8	35.0	52.2
1947	34.0	22.0	32.2	49.6	57.2	67.2	67.6	76.6	64.1	59.5	38.2	31.0	50.0
1948	19.7	28.8	41.0	53.8	59.0	69.2	73.0	70.3	65.3	49.3	45.0	33.5	50.6
1949	35.6	35.2	40.2	48.2	61.1	71.7	76.4	70.8	57.6	56.8	41.2	35.0	52.4
1950	38.1	31.7	36.5	44.8	61.9	66.0	69.5	66.9	61.9	56.3	35.7	22.9	49.3
1951	29.9	30.0	38.2	47.9	61.2	68.1	71.5	69.9	60.9	54.6	35.4	30.4	49.8
1952	33.5	33.9	39.1	50.0	59.2	73.5	74.5	69.6	62.3	47.6	41.3	34.9	51.6
1953	34.0	34.4	41.8	47.1	63.3	72.3	72.7	71.6	64.2	54.6	41.5	32.7	52.5
1954	31.8	38.6	37.2	55.8	55.6	72.1	73.6	71.4	67.0	54.9	40.9	31.4	52.5
1955	27.6	31.5	40.8	55.7	62.1	65.0	76.8	74.2	66.4	53.5	37.2	28.5	51.6
1956	25.4	33.6	38.5	47.4	60.7	69.3	71.5	71.3	61.2	56.7	40.1	38.3	51.2

STATION HISTORY

The weather station has been located at the Water Works 2.5 miles east-northeast of the Richmond Post Office since January 1, 1896. This is one of the longest records of weather data at one location anywhere in the state. Much credit for this must be given the weather observers of the past years for faithful service. Walter Vossler made the observations from October 1, 1899 to February 4, 1933; John Vossler from February 5, 1933 to July 1, 1940; William Armbuster from July 1, 1940 to October 31, 1952; Archie Wogoman from December 1, 1952 to May 1, 1955; and Carl Armbuster from May 2, 1955 up to the present time. The exact location of the station before 1896 is not known but J. M. Gluys made observations from July 1882 to January 31, 1888 and E. J. Mote from February 1, 1888 to December 31, 1892. Data as early as 1852 is filed in the National Archives.

Temperatures were taken from thermometers in a shelter about 5 feet above the ground. Occasionally trees were found to partially obstruct the raingage but in time this was remedied. Station elevation above mean sea level has been recorded as 972 feet and latitude 39° 51' N., longitude 84° 50' W. The White River is about 700 feet east of the exposure site. A recording raingage giving hourly rainfall data was installed at the station in 1940.

EXTREMES AND DATE OF OCCURRENCE FOR PERIOD OF 1887-1892 AND 1896-1956

Month	Record Daily Temperature Highest		Lowest		Precipitation Greatest Daily		Snowfall Greatest Monthly	
Jan.	72	1/25/50	-26	1/3/04	3.43	1/4/49	18.8	1915
Feb.	72	2/10/32	-27	2/13/99	2.03	2/24/90	22.4	1910
Mar.	85	3/24/10	- 9	3/8/43	5.30	3/24/13	19.3	1906
Apr.	89	4/30/42+	13	4/1/23	2.47	4/20/16	3.4	1920
May	98	5/27/11	26	5/4/03	2.68	5/30/89	2.7	1923
June	101	6/28/34	35	6/8/12	3.21	6/18/39		
July	103	7/21/34	33	7/8/34	3.26	7/13/14		
Aug.	100	8/5/18	39	8/30/46	4.87	8/7/96		
Sept.	98	9/3/13+	26	9/26/28	4.51	9/1/26		
Oct.	89	10/1/97	15	10/29/25	4.08	10/5/10	3.7	1925
Nov.	86	11/2/02	- 1	11/28/30	2.95	11/16/55	12.0	1950
Dec.	69	12/6/56	-24	12/14/98	2.39	12/30/32	12.9	1914

Total Precipitation (Inches)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Ann'l
1927	3.16	1.43	4.41	5.72	3.46	4.09	2.52	2.95	3.97	2.33	5.58	2.49	42.11
1928	1.78	2.96	2.13	3.25	2.39	8.31	2.99	2.78	0.54	3.59	2.99	1.84	35.55
1929	5.50	2.83	2.92	4.84	6.87	7.00	3.51	1.78	2.02	3.15	2.17	4.08	46.67
1930	7.53	2.77	1.32	1.16	1.50	1.97	2.27	2.03	6.95	2.05	1.79	1.05	32.39
1931	0.67	1.60	2.78	3.24	2.12	5.02	1.85	3.23	2.83	2.82	3.26	3.07	32.49
1932	5.78	1.56	3.53	2.34	0.31	6.10	2.89	2.11	6.81	3.95	2.63	4.64	42.65
1933	2.73	1.76	5.27	2.89	8.31	1.09	2.11	2.59	5.14	2.01	0.94	2.89	37.73
1934	1.09	0.48	2.78	1.18	0.91	2.63	3.02	4.49	3.99	0.54	1.29	1.43	23.83
1935	1.74	0.35	2.65	1.15	6.43	3.99	5.44	1.97	3.04	4.60	2.32	1.84	35.52
1936	1.25	3.14	2.94	3.77	2.05	0.69	1.79	4.07	5.70	6.22	3.13	1.98	36.73
1937	12.05	1.79	1.03	3.25	3.34	3.88	4.95	4.97	3.11	4.20	1.88	2.74	47.19
1938	0.68	1.94	5.87	2.34	6.04	5.69	4.61	0.55	3.40	0.70	4.60	1.01	37.43
1939	2.25	2.53	2.31	5.02	1.10	7.27	5.90	3.14	0.90	3.61	1.07	1.18	36.28
1940	1.50	2.19	1.26	5.16	4.36	3.17	2.54	2.57	1.12	3.08	3.05	2.47	32.47
1941	1.46	1.38	0.73	1.95	1.20	7.64	3.32	2.67	1.92	7.91	1.77	1.99	33.94
1942	0.87	3.83	2.99	1.88	3.91	3.92	4.58	4.14	3.43	1.65	2.89	2.34	36.43
1943	1.42	1.67	6.01	2.43	5.75	2.67	5.82	2.53	3.13	1.83	1.10	0.82	35.18
1944	0.49	2.82	4.88	5.02	3.85	3.43	2.32	5.50	2.66	0.16	2.32	1.93	35.38
1945	0.77	2.61	8.24	3.74	3.16	8.17	2.79	1.70	6.20	2.15	2.49	3.07	45.09
1946	0.87	3.65	3.49	1.40	5.31	2.19	2.85	1.84	0.29	2.58	2.69	3.79	30.95
1947	4.21	0.42	2.22	5.89	6.36	7.51	3.95	4.86	3.26	1.65	1.45	1.49	43.27
1948	2.39	3.28	4.81	4.25	3.81	2.88	1.94	2.14	3.01	2.84	6.78	2.71	40.84
1949	8.73	2.73	8.16	2.28	2.43	5.03	4.82	3.30	4.10	3.66	0.64	3.49	44.37
1950	11.62	4.63	2.55	4.72	2.36	6.00	3.54	3.93	4.61	1.78	6.47	2.56	54.77
1951	4.03	3.02	4.20	3.21	2.38	5.78	2.19	1.53	3.23	1.65	5.00	5.58	41.80
1952	5.26	2.19	4.06	3.24	3.04	4.98	1.83	3.08	3.17	0.68	3.20	3.51	38.24
1953	3.28	0.55	3.67	2.66	4.83	2.88	2.46	1.33	1.28	0.84	0.83	2.75	27.36
1954	3.34	1.49	2.24	3.89	2.03	2.72	3.37	5.10	0.85	3.76	1.76	2.53	33.08
1955	1.93	3.79	2.94	2.68	3.12	3.75	5.88	2.17	7.15	3.15	5.17	0.38	42.11
1956	1.50	3.87	2.43	3.72	5.01	1.72	3.81	1.23	1.52	0.88	3.10	3.02	31.81

MEAN DAILY TEMPERATURES

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Jan.	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
Feb.	30	30	30	30	30	30	30	30	30	30	30	31	31	31	31	31	32	32	32	32	32	33	33	33	33	24	24	35	35		
Mar.	35	35	36	36	36	37	37	37	37	38	38	38	39	39	39	39	40	40	41	41	41	42	42	42	43	43	44	44	44	45	45
Apr.	45	46	46	46	46	47	47	47	48	48	48	49	49	49	50	50	50	51	51	51	52	52	52	53	53	54	54	54	55	55	
May	55	56	56	56	57	57	57	58	58	58	58	59	59	59	60	60	60	61	61	61	62	62	62	63	63	63	64	64	64	65	65
June	66	66	66	67	67	67	67	68	68	68	68	69	69	69	69	70	70	70	70	71	71	71	71	71	72	72	72	72	72	72	
July	73	73	73	73	73	73	73	73	73	73	73	73	74	74	74	74	74	74	74	74	74	74	74	74	73	73	73	73	73	73	73
Aug.	73	73	72	72	72	72	72	72	72	72	71	71	71	71	71	71	71	70	70	70	70	70	70	70	69	69	69	69	69	69	69
Sept.	68	68	68	68	68	68	67	67	67	67	67	67	66	66	66	66	65	65	65	64	64	64	63	63	63	62	62	62	61	61	
Oct.	61	60	60	60	59	59	58	58	57	57	57	56	56	55	55	54	54	53	53	52	52	51	51	51	50	50	49	49	49	48	48
Nov.	47	47	46	46	45	45	44	44	43	43	42	42	42	41	41	41	40	40	40	39	39	38	38	37	37	36	36	35	35	35	
Dec.	34	34	34	33	33	33	33	32	32	32	32	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30

Daily mean temperatures calculated from monthly mean temperatures and adjusted to daily normal temperatures of the area.

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	4/9/55	5/1*	5/26/25	9/14/23	10/11*	11/8/47
28 or lower	3/22/22	4/16	5/10/23	9/24/28	10/25	11/11/47
24 or lower	3/4/38	4/2	4/28/34	10/15/39	11/5	11/24/47
20 or lower	2/19/45	3/17	4/12/40	10/20/52	11/16	12/22/21
16 or lower	1/22/31	3/8	4/1/23	10/21/52	11/28	1/31/32

Use of the table: The average date of the last temperature of 32 or colder in the spring is May 1. The earliest date of this event in all springs of the 1921-1956 period was April 9 in 1955. The latest date was May 26 in 1925. In the fall, 32 or colder occurred for the first time as early as September 14 (1923) and as late as November 8 (1947). The average date is October 11.

*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.