

U. S. DEPARTMENT OF COMMERCE, ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
 IN COOPERATION WITH THE OHIO AGRICULTURAL RESEARCH AND DEVELOPMENT CENTER
 AND THE OHIO DEPARTMENT OF NATURAL RESOURCES - DIVISION OF WATER
 CLIMATOGRAPHY OF THE UNITED STATES NO. 20-33 - 18

LATITUDE 41°17'N
 LONGITUDE 84°23'W
 ELEV. (GROUND) 700 Ft.

CLIMATOLOGICAL SUMMARY

STATION: Defiance, Ohio

MEANS AND EXTREMES FOR PERIOD 1936-1965

MONTH	TEMPERATURE (°F)												PRECIPITATION TOTALS (INCHES)												MONTH						
	MEANS				EXTREMES				MEAN DEGREE DAYS %	MEAN NUMBER OF DAYS				GREATEST MONTHLY	YEAR	GREATEST DAILY	YEAR	DAY	SNOW, SLEET				MEAN NUMBER OF DAYS								
	DAILY MAXIMUM	DAILY MINIMUM	MONTHLY	RECORD HIGHEST	YEAR	DAY	RECORD LOWEST	YEAR		DAY	MAX.	BELOW	MIN.						MEAN	MAXIMUM MONTHLY	YEAR	GREATEST DAILY	YEAR	DAY		.01 or MORE	.10 or MORE	.50 or MORE	1.00 or MORE		
										90° AND ABOVE	32° AND BELOW	32° AND BELOW	32° AND BELOW	0° AND BELOW																	
JAN	32.9	16.5	24.7	68	50	26	-19	63	24	1243	0	14	28	3	2.24	7.53	50	1.58	50	4	6.7	20.7	39	6.0	65	16	10	5	1.3	.4	JAN
FEB	35.7	17.8	26.7	71	44	26	-16	51	2	1077	0	10	26	2	2.07	4.70	50	1.60	50	14	6.3	13.0	40	6.0	65	25	9	5	1.2	.3	FEB
MAR	45.1	26.0	35.5	82*	45	28	-7	48	32	909	0	4	24	0	2.74	5.30	45	1.80	49	31	4.1	9.0	62	6.0	62	5	10	6	1.7	.3	MAR
APR	59.1	36.7	47.9	88	42	30	12	37	9	516	0	0	20	0	3.39	6.00	57	2.95	56	29	1.2	14.0	57	7.0	57	8	12	7	2.2	.6	APR
MAY	71.6	47.9	59.7	94*	52	19	26	53	1	210	1	0	1	0	3.37	9.11	43	2.24	66	7	.0	.0	.0	.0	.0	11	7	2.1	.6	MAY	
JUNE	81.3	57.6	69.4	100*	44	28	37	45	5	39	5	0	0	0	4.04	7.24	39	3.01	38	26	.0	.0	.0	.0	.0	10	7	2.6	1.1	JUNE	
JULY	85.2	61.2	73.2	106	36	14	43*	50	1	5	8	0	0	0	3.37	7.96	43	2.52	43	11	.0	.0	.0	.0	.0	9	6	2.4	.9	JULY	
AUG	83.9	59.5	71.7	102	48	26	36	65	29	13	6	0	0	0	2.60	5.70	59	2.15	63	3	.0	.0	.0	.0	.0	8	5	1.5	.4	AUG	
SEPT	77.0	51.6	64.3	100*	39	15	29	42	28	117	3	0	0	0	2.44	6.37	50	3.10	50	1	.0	.0	.0	.0	.0	8	5	1.5	.4	SEPT	
OCT	65.8	40.6	53.2	92	51	5	17	52	21	373	0	0	5	0	2.44	5.91	56	2.30	50	10	.0	1.5	62	1.0	62	25	8	5	1.4	.7	OCT
NOV	49.0	30.0	39.5	82	50	1	0	58	30	762	0	2	19	0	2.26	4.78	45	1.45	50	20	2.0	9.8	59	5.1	50	26	10	5	1.4	.3	NOV
DEC	36.7	20.1	28.4	65	41	4	-16	50	27	1130	0	10	27	1	1.78	3.42	57	1.35	36	31	3.3	19.8	44	5.4	44	25	9	4	1.2	.1	DEC
YEAR	60.2	38.7	49.5	106	36	14	-19	63	24	6394	23	40	189	6	32.74	9.11	47	3.10	50	1	25.6	20.7	37	7.0	57	8	114	66	21	6	YEAR

** BASE 65° F *ALSO ON EARLIER DATES, MONTHS, OR YEARS

NARRATIVE CLIMATOLOGICAL SUMMARY

Defiance is located in the southeast quadrant of Defiance County in northwest Ohio. The Auglaize and Maumee Rivers join near the center of the city. Terrain within Defiance County is relatively flat; the elevation of the earth's surface above sea level varies from about 660 to 870 feet. A map of the physiographic regions of Ohio shows much of Defiance County to be a part of Ohio's Lake Plains. During the glacial age, this area was submerged by the waters of old Lake Maumee. Presently, general farming is the prevailing agricultural activity within this lake bed.

The climate of Defiance is marked by large annual, daily, and day to day ranges in temperature. Summers are moderately warm and humid, with occasional days when temperatures exceed 90°F; winters are reasonably cold and cloudy with an average of 6 days with sub-zero temperatures. Weather changes occur every few days from the passing of cold or warm fronts and their associated centers of high and low pressure.

Mean temperature for the year is slightly more than one degree below the average for northwest Ohio. The normal daily range in temperature is greatest in late summer and least in winter. Extreme temperature range (record high minus record low) during the period 1936-1965 is 125 degrees. Coldest month of record for the period 1936-1965 is January 1963. In that month, temperatures were above freezing on only 7 days while sub-zero temperatures were recorded on 15 days. Warmest month of record during the period 1936-1965 is July 1955. During that month, the daily maximum temperature exceeded 89°F on 18 days. On 11 of those days, the daily minimum was greater than 69°F. Temperature of 90°F has occurred as early as mid-April; however, such days are more common in the period June through August.

Heating degree days as shown in the above table are a measure of the departure of the mean daily temperature from 65°F. The daily totals are accumulated from July 1 through June 30. At any point during the year, the accumulated degree days can be used as an index of past temperature effect upon power consumption and fuel consumption for heating of homes and businesses.

Taking the number of days between the last freezing temperature (32°F) of spring and the first freezing temperature in fall as the crop-growing season, this season averages 156 days in length. The growing season is 178 days or more in 10% of the years, 165 days or more in 30% of the years, less than 147 days in 30% of the years, and less than 134 days in 10% of the years. A temperature of 32°F or less has been recorded as late as May 27 in spring and as early as September 18 in fall.

The mean annual precipitation of 32.74 inches is about one inch below the mean for northwest Ohio. Precipitation is normally abundant and well distributed throughout the year with fall being the driest season. Showers and thundershowers account for most of the rainfall during the growing season. Thunderstorms occur on about 42 days each year. Most of these occur April through August. Snowfall averages about 26 inches

a year although as little as 5 inches fell during the winter of 1948-49 and as much as 55 inches fell during the winter of 1944-45. As is typical of much of Ohio, most precipitation during the winter months comes in the form of rain.

Evaporation is greatest during the warm months and is then most critical for agriculture. During the period May through September potential evaporation normally exceeds rainfall by about 9 inches. During the period 1936-1965, the driest growing season of record is 1941. In that year, the potential evaporation exceeded the rainfall by more than 15 inches. When evaporation exceeds rainfall for prolonged periods, a drought may occur; however, severe droughts seldom occur in Defiance County.

Humidity, cloudiness, sunshine, and wind observations are not recorded in Defiance; however, estimates of these variables can be made from observations taken at other locations. Relative humidity, the ratio between the amount of moisture in the air and the amount which could be present, without condensation, at the same temperature and pressure, is an important factor in human and animal comfort and in the growth and development of vegetation. Generally, humidity rises and falls inversely with the daily temperature and is lowest in summer and highest in winter. For the year, relative humidity averages 79% at 1 AM, 83% at 7 AM, 61% at 1 PM, and 65% at 7 PM. Cloudiness is greatest in winter and least in summer. This seasonal variation is most clearly illustrated by the percentage of possible sunshine which is about 71% in July and 40% in December. Heavy fog occurs about 20 days each year and is most frequent during the cold half of the year. Death from smog is unknown. The prevailing wind direction for the year is southwest, averaging nearly 8 mph in summer and 11 mph in winter. Damaging winds occur most often during spring and summer. Such storms are usually associated with migrating thunderstorms.

The tornado, one of the most destructive of all atmospheric storms, is characterized by a violently rotating column of air which is nearly always observable as a "funnel cloud". It frequently leaves great destruction along a narrow path, and is usually accompanied by heavy rain and hail, and often by lightning and thunder. Since 1900, 4 such storms have been reported in Defiance County. During the last decade, Ohio has averaged slightly more than 11 tornadoes a year.

Local flooding of the lowlands along the Maumee and Auglaize Rivers occurs practically every year, but general floods of a serious character are much less frequent. Flood stage in this area is 10.0 feet. Major flooding occurs when the river depth reaches 16.0 feet. Since 1912, major floods have occurred in 1913, 1943, 1947, and 1950. In March 1913, the depth of the Maumee River in Defiance reached 26.0 feet.

May 1967

Marvin E. Miller
 ESSA Weather Bureau State Climatologist
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PROBABILITY OF FREEZES OCCURRING AS LATE IN THE
 SPRING OR AS EARLY IN THE FALL AS DATES SHOWN
 IN THE FOLLOWING TABLE

PERCENT CHANCE OF LATER DATE IN SPRING	TEMPERATURE LEVELS							
	16°	20°	24°	28°	32°	36°		
90	FEB 27	MAR 7	MAR 18	APR 2	APR 17	APR 29		
70	MAR 8	MAR 17	MAR 28	APR 12	APR 26	MAY 7		
50	MAR 15	MAR 24	APR 4	APR 19	MAY 2	MAY 12		
30	MAR 21	APR 1	APR 10	APR 26	MAY 8	MAY 18		
10	MAR 31	APR 11	APR 20	MAY 5	MAY 17	MAY 26		

PERCENT CHANCE OF EARLIER DATE IN FALL								
10	NOV 15	OCT 27	OCT 19	OCT 12	SEPT 18	SEPT 11		
30	NOV 23	NOV 8	OCT 28	OCT 20	SEPT 28	SEPT 19		
50	NOV 29	NOV 16	NOV 4	OCT 25	OCT 5	SEPT 24		
70	DEC 4	NOV 24	NOV 10	OCT 31	OCT 12	SEPT 30		
90	DEC 12	DEC 6	NOV 19	NOV 7	OCT 23	OCT 7		

STATION HISTORY

DATE	LOCATION	ELEVATION	OBSERVER
	(From Post Office)	(Ft. MSL)	
5/1895 - 12/1905	4.5 miles W	712	H. Heilshorn
1/1906 - 2/1912	In City	705	J. Heilshorn
11/1922 - 4/1926	Unknown	Unknown	H. T. Campion
4/1926 - 3/1948	1.0 miles W	707	Fred Murphy
3/1948 - 1/1949	5.0 miles WSW	700	J. W. Nischwitz
2/1949 - 1/1958	1.0 miles WSW	700	Thomas Boyd
2/1958 - Present	1.0 miles WSW	700	Robert Kehnast

AVG. TEMPERATURE (°F)

YEAR	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ANNUAL
36	19.3	14.9	39.6	43.6	63.5	67.3	76.4	74.7	67.4	52.2	35.8	33.0	49.0
37	29.0	28.8	31.8	46.7	59.8	68.7	73.1	74.2	61.8	50.1	37.0	26.3	48.8
38	25.4	33.9	43.4	51.5	60.7	68.5	73.8	74.3	64.3	53.6	40.6	30.1	51.9
39	28.9	28.8	35.3	45.0	62.8	71.6	72.7	72.0	67.0	53.6	38.5	33.5	48.9
40	15.0	27.0	31.3	44.7	56.8	70.6	74.2	72.3	63.0	54.1	37.9	39.1	48.3
41	26.6	24.7	31.1	53.7	63.2	70.7	74.3	73.8	69.3	56.1	41.7	34.8	51.7
42	26.1	22.9	28.0	25.8	51.6	62.4	70.5	74.4	72.7	61.4	52.6	38.2	49.7
43	26.0	30.4	33.4	45.9	66.0	74.3	75.4	75.4	65.9	52.2	41.7	29.1	51.2
44	17.8	20.8	48.8	52.1	52.8	66.0	66.0	70.5	70.7	65.7	50.0	41.2	48.9
45	17.8	28.8	48.8	52.1	52.8	66.0	66.0	70.5	70.7	65.7	50.0	41.2	48.9
46	27.4	28.8	47.7	48.7	56.6	67.4	72.5	67.2	64.4	56.7	43.2	32.5	51.1
47	29.6	20.9	30.5	46.4	55.2	65.5	68.9	77.8	65.0	60.6	38.7	28.7	48.8
48	18.0	26.2	37.5	54.1	57.0	69.0	74.3	71.7	67.1	49.8	46.7	33.2	50.4
49	38.8	33.6	35.2	48.2	62.2	73.5	76.0	73.0	68.5	56.9	39.9	32.7	55.2
50	31.1	26.1	30.5	41.3	60.1	67.0	70.2	67.0	67.0	55.3	38.8	21.7	47.6
51	27.0	24.8	36.0	45.9	60.5	68.7	71.9	69.5	67.4	55.2	32.7	26.6	48.5
52	29.8	30.7	35.0	49.1	57.9	73.8	76.3	70.7	67.0	47.1	41.4	31.9	50.6
53	29.9	31.0	38.9	44.4	61.2	72.4	74.8	72.7	65.0	53.4	42.3	32.0	52.5
54	28.8	33.6	33.7	51.1	55.3	72.5	72.9	69.4	66.2	53.9	39.3	23.0	50.4
55	24.4	27.7	36.0	54.3	62.0	67.2	78.6	79.7	69.6	59.8	30.4	23.2	50.6
56	22.2	27.9	32.9	45.2	57.8	70.5	72.3	71.2	61.4	56.7	39.7	34.4	49.5
57	18.2	21.1	32.1	48.3	57.7	64.3	72.8	70.0	63.7	52.9	42.4	19.8	47.6
58	17.0	26.1	34.8	43.1	63.4	70.6	73.0	76.7	67.0	51.2	34.6	33.9	50.1
59	28.0	26.4	23.0	50.9	57.0	66.7	70.6	72.0	67.2	51.2	41.5	21.8	48.0
60	28.0	26.4	23.0	50.9	57.0	66.7	70.6	72.0	67.2	51.2	41.5	21.8	48.0
61	20.6	30.2	38.7	41.9	55.0	66.5	71.7	70.0	60.1	51.6	39.2	26.7	48.5
62	20.7	22.8	33.0	46.8	64.8	69.9	70.2	70.7	68.9	53.3	37.5	23.7	47.9
63	15.4	16.0	36.2	48.6	56.0	69.2	72.2	66.5	60.8	58.8	18.9	46.7	48.7
64	25.9	24.4	34.6	48.0	63.0	68.8	74.3	68.3	63.4	47.4	42.4	26.4	48.8
65	23.7	23.6	28.7	44.4	63.0	68.6	65.1	68.0	66.7	48.9	40.2	33.6	48.3
66	20.6	25.6	37.8	44.5	53.3	70.0	74.0	69.8	61.2	48.3	40.6	28.3	47.8

TOTAL PRECIPITATION (INCHES)

YEAR	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ANNUAL
36	1.07	2.57	2.93	2.12	1.94	2.73	1.99	2.20	2.95	4.32	1.78	2.67	29.27
37	5.35	1.32	1.47	4.93	2.97	6.07	5.84	2.23	2.52	1.93	1.43	1.37	31.47
38	6.63	2.95	5.07	3.27	3.26	5.54	3.81	2.88	2.58	4.64	1.59	1.52	32.35
39	2.74	3.97	4.09	4.19	4.83	7.54	5.31	1.74	2.59	4.87	1.78	25.25	
40	1.31	1.50	1.19	3.64	2.86	4.25	3.68	3.58	1.74	2.97	2.80	2.97	27.97
41	1.68	1.40	1.00	1.52	2.38	2.11	1.25	1.77	1.65	4.83	2.15	1.86	21.54
42	1.98	2.55	3.07	2.67	2.55	4.41	3.78	5.35	1.73	1.92	3.74	1.83	31.42
43	1.95	1.90	2.67	9.11	6.97	7.96	9.11	1.80	1.80	1.99	1.87	1.40	38.17
44	8.7	2.16	3.00	5.91	4.09	9.11	1.49	8.6	2.19	1.73	2.46	2.07	28.82
45	1.45	1.45	5.30	3.01	5.34	5.35	3.62	1.14	6.09	3.46	1.28	2.22	39.31
46	1.50	1.59	2.40	4.81	4.61	6.98	2.05	1.25	2.30	3.05	2.41	1.96	30.32
47	3.44	4.47	2.00	4.80	5.01	5.67	2.70	3.69	3.48	1.77	2.66	2.07	31.76
48	1.50	2.44	4.21	2.98	4.86	2.45	3.62	1.43	2.07	1.55	4.98	2.80	31.99
49	3.79	2.44	1.55	2.39	5.17	3.86	3.32	1.16	2.81	3.56	4.63	3.03	33.71
50	7.83	4.70	3.48	3.98	1.00	4.78	2.01	1.59	6.37	3.13	4.70	2.40	48.17
51	1.30	2.95	4.13	4.01	3.33	4.94	2.33	2.26	2.15	3.92	2.31	3.36	36.99
52	4.29	1.30	3.26	3.43	6.08	1.61	2.71	2.32	3.35	4.76	2.41	1.66	34.18
53	1.54	1.08	2.81	3.16	2.87	1.63	2.87	2.61	2.11	3.47	1.73	1.53	22.46
54	2.56	3.26	3.72	2.72	1.34	3.32	4.84	4.50	1.65	3.51	1.73	1.34	26.82
55	1.12	1.70	3.16	2.72	1.90	1.96	3.42	2.10	1.65	4.72	4.83	3.50	28.52
56	1.13	2.05	2.73	4.22	6.07	2.53	2.02	3.10	.67	.25	1.77	2.17	28.71
57	1.55	1.61	1.21	6.00	2.67	5.71	2.09	1.66	2.74	4.30	1.85	3.42	34.19
58	1.33	.62	1.59	2.61	1.41	5.94	4.45	5.70	2.03	1.05	3.36	1.16	29.25
59	4.05	2.97	3.18	3.87	3.57	4.05	4.50	2.83	2.66	3.75	3.43	2.83	41.64
60	3.15	3.02	1.76	1.24	3.88	3.43	2.72	2.18	.84	.97	1.87	.82	24.66
61	3.01	3.37	4.27	5.94	2.23	3.35	3.63	2.42	3.30	1.79	2.04	1.51	34.06
62	6.2	2.02	1.52	1.00	3.42	1.14	3.99	2.14	3.99	1.97	1.32	.56	26.11
63	.97	.72	2.27	4.04	2.64	3.24	4.30	3.25	.94	.00	2.26	.56	25.44
64	1.84	1.07	4.72	5.31	1.46	3.87	3.40	1.94	2.45	.32	1.37	1.48	29.23
65	4.79	3.10	2.50	2.76	2.89	1.49	4.04	5.58	3.62	5.07	1.76	2.24	39.84
66	.84	.93	1.74	2.85	3.47	2.63	3.49	4.05	2.02	1.21	7.03	6.03	36.09

ANN: 23.90 25.63 27.85 29.43 31.01 32.44 33.92 35.35 37.52 40.30 42.82

Average precipitation amounts (0.50 probability level) in the above table differ from the means shown on the opposite page because of the method used in making the computations. The above values were determined from the gamma distribution whose curves have been found to give best fits to precipitation climatological series.

PRECIPITATION WITH PROBABILITY EQUAL OR LESS THAN

SEASON	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	TOTAL
36-37	.0	1.5	3.0	6.1	6.1	1.0	1.5	.0	.0	13.1
37-38	.0	2.2	2.2	7.5	7.5	4.0	4.0	.0	.0	17.4
38-39	.0	5.0	20.7	11.0	20.7	8.6	8.6	.0	.0	40.5
39-40	.0	6.9	13.0	13.0	13.0	2.5	4.0	.0	.0	29.4
40-41	.0	4.5	2.4	6.0	6.0	1.7	3.4	.0	.0	18.0
41-42	.0	1.0	5.1	5.1	5.1	2.2	6.8	3.4	1.0	20.3
42-43	.0	1.3	1.3	12.3	12.3	5.6	1.0	.0	.0	20.6
43-44	.0	19.9	79.2	8.7	6.0	6.0	.0	.0	.0	54.8
44-45	.0	2.5	9.3	9.0	4.1	.0	.0	.0	.0	20.9
45-46	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
46-47	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
47-48	.0	2.2	2.2	7.5	7.5	4.0	4.0	.0	.0	17.4
48-49	.0	1.9	5.2	7.8	7.8	3.9	1.1	.0	.0	23.8
49-51	.0	8.0	10.1	6.9	6.0	6.0	3.9	.0	.0	34.9
51-52	.0	3.9	14.6	4.4	6.5	4.1	.0	.0	.0	33.5
52-53	.0	6.0	5.1	5.2	5.1	1.7	.0	.0	.0	18.0
53-54	.0	2.7	2.5	7.0	6.6	5.8	.0	.0	.0	24.6
54-55	.0	2.2	2.7	4.1	7.0	6.0	.0	.0	.0	21.4
55-56	.0	3.0	3.0	10.0	5.4	7.0	3.0	.0	.0	30.0
56-57	.0	1.5	5.9	13.5	2.7	5.1	1.4	.0	.0	42.7
57-58	.0	3.0	3.0	11.6	1.2	5.0	.0	.0	.0	13.8
58-59	.0	9.0	4.0	9.0	5.2	4.9	.0	.0	.0	28.2
59-61	.0	2.0	2.0	3.0	3.0	4.0	.0	.0	.0	18.0
61-62	.0	1.0	1.0	7.5	6.9	13.0	.0	.0	.0	26.3
62-64	.0	3.0	3.0	7.0	6.0	12.5	.0	.0	.0	33.5
64-65	.0	3.0	6.0	12.5	9.0</					