

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. 20-33-36

CLIMATOLOGICAL SUMMARY

STATION: Chardon, Ohio

LATITUDE 41° 35' N
 LONGITUDE 81° 12' W
 ELEV. (GROUND) 1260 Ft.

MEANS AND EXTREMES FOR PERIOD 1946-1965

MONTH	TEMPERATURE (° F)											PRECIPITATION TOTALS (INCHES)											MONTH												
	MEANS			EXTREMES					MEAN DEGREE DAYS **	MEAN NUMBER OF DAYS				MEAN	GREATEST MONTHLY	GREATEST DAILY	YEAR	DAY	SNOW, SLEET					MEAN NUMBER OF DAYS											
	DAILY MAXIMUM	DAILY MINIMUM	MONTHLY	RECORD HIGHEST	YEAR	DAY	RECORD LOWEST	YEAR		DAY	90° AND ABOVE	32° AND BELOW	32° AND BELOW						0° AND BELOW	MEAN	GREATEST MONTHLY	GREATEST DAILY		YEAR	DAY	MEAN	MAXIMUM MONTHLY	YEAR	GREATEST DAILY	YEAR	DAY	.01 or MORE	.10 or MORE	.50 or MORE	1.00 or MORE
JAN	33.7	18.7	26.2	70	90	25	-20	63	24	1159.	0	14	28	2	3.55	7.38	50	2.30	59	21	24.0	43.5	57	12.0	65	18	16	9	2.1	.2	JAN				
FEB	35.9	19.1	27.5	67	61	24	-13*	63	27	1055.	0	10	25	1	2.88	4.81	50	1.90	59	10	20.5	45.5	47	12.0	51	1	13	8	1.3	.4	FEB				
MAR	43.7	25.9	34.8	77	46	28	-3	50	N	932.	0	9	24	3	3.96	8.16	54	3.60	54	1	18.9	41.0	60	11.0	59	12	15	9	2.2	.4	MAR				
APR	57.6	36.9	47.2	85	48	28	-2*	64	1	534.	0	0	11	0	4.63	8.07	57	3.80	48	27	5.1	24.5	57	10.0	57	7	15	10	2.7	.5	APR				
MAY	69.0	46.8	57.9	90	62	18	27	47	10	244.	0	0	1	0	3.89	7.12	46	2.12	57	20	.1	3.0	63	3.0	63	1	13	9	2.4	.8	MAY				
JUNE	77.8	55.7	66.7	95*	52	26	35	49	8	63.	1	1	0	0	3.86	6.06	57	3.32	59	1	.0	.0	46	.0	0	0	10	7	2.8	.7	JUNE				
JULY	81.5	59.7	70.6	96	54	14	46*	53	8	10.	1	1	0	0	3.66	7.33	58	2.00	55	1	.0	.0	46	.0	0	0	11	7	2.5	.8	JULY				
AUG	80.3	58.4	69.3	96	48	26	43	65	8	21.	0	0	0	0	3.93	10.12	58	4.00	52	13	.0	.0	56	.5	56	20	9	5	1.8	.5	AUG				
SEPT	74.3	52.2	63.8	98	53	24	51	57	28	129.	0	0	0	0	2.81	5.66	62	2.72	59	30	1.6	13.0	54	12.0	54	31	11	7	2.4	.6	SEPT				
OCT	64.3	43.4	53.8	87*	50	20	32	65	29	355.	0	0	2	0	3.51	12.10	54	2.62	54	15	12.5	38.5	50	14.0	50	25	14	9	1.8	.7	OCT				
NOV	48.6	32.7	40.5	80	50	16	10	51	17	727.	0	2	15	0	3.90	8.33	50	2.67	62	10	12.5	38.5	50	15.0	40	21	15	8	1.6	.1	NOV				
DEC	36.4	22.4	29.4	66	56	8	-10	51	17	1099.	0	12	26	0	3.26	5.99	62	1.75	62	7	23.4	69.5	62	15.0	60	21	15	8	1.6	.1	DEC				
YEAR	58.5	39.3	48.9	98	53	2	-20	63	24	636.4	5	43	132	3	43.84	12.10	54	4.00	52	15	106.1	69.5	62	15.0	60	21	153	95	26.	6.	YEAR				

** BASE 65° F *Also on earlier dates, months, or years.

NARRATIVE CLIMATOLOGICAL SUMMARY

Chardon is located in the north central portion of Geauga County in northeast Ohio. Terrain within Geauga County is hilly. The elevation of the earth's surface above sea level varies from about 880 to 1400 feet. A map of the physiographic regions of Ohio shows Geauga County to be a part of Ohio's Glaciated Plateau. The topography of this area is more subdued than that of the nonglaciated Plateau lying to the south. Manufacturing is the prevailing activity of the people of the Glaciated Plateau although agriculture of a specialized nature is important.

The climate of Geauga County is classified as continental. Such a climate is a characteristic of a land mass the size of North America and is marked by large annual, daily, and day to day ranges in temperatures. West to northerly winds blowing off Lake Erie tend to lower daily high temperatures in summer and raise temperatures in winter. When winds are from directions other than those mentioned above the presence of the lake has little effect upon temperatures within Geauga County. In this area, summers are moderately warm and humid with occasional days when temperatures exceed 90°F; winters are reasonably cold and cloudy with an average of 3 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 pressures.

Normal mean temperature for the year is slightly more than 1 degree below the average for northeast Ohio. On nights with clear skies and light winds there is often a large variation in observed surface temperatures within Geauga County. This is especially true in the vicinity of hills. On such nights, the air near the tops of hills becomes cooler and denser than air at the same heights over the valleys. These air temperature and density differences cause the cool air to drain down the slopes and into valleys. This drainage often results in large differences in surface temperatures between the valley floors and the tops of hills. The daily range in temperature is usually greatest in late summer and least in winter. The extreme temperature range (record high minus record low) during the period 1946-1967 is 118 degrees. Annual extremes in temperature normally occur soon after June 21 and December 22. Maximum temperatures below freezing occur most often during December, January, February. Coldest month of record is January 1963. In that month, temperature did not exceed 32°F on 21 days and sub-zero lows were recorded on 9 days. Temperatures of 100°F or higher have never been recorded at Chardon. Warmest month of record is July 1955. In that month, daily highs exceeded 89°F on 7 days.

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 167 days in length. The growing season is 186 days or more in 10% of the years, 174 days or more in 30% of the years, less than 159 days in 30% of the years and less than 147 days in 10% of the years. At Chardon, temperatures of 32°F or less have been recorded as late as May 25 in Spring and as early as September 28 in Fall.

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	MAR 7	MAR 14	MAR 24	APR 8	APR 20	APR 28
70	MAR 15	MAR 21	MAR 31	APR 14	APR 28	MAY 8
50	MAR 21	MAR 27	APR 5	APR 19	MAY 3	MAY 14
30	MAR 26	APR 1	APR 10	APR 24	MAY 9	MAY 21
10	APR 4	APR 8	APR 17	APR 30	MAY 17	MAY 30

PERCENT CHANCE OF EARLIER DATE IN FALL	TEMPERATURE LEVELS					
	16°	20°	24°	28°	32°	36°
10	NOV 15	NOV 13	OCT 28	OCT 19	OCT 11	SEPT 20
30	NOV 24	NOV 21	NOV 6	OCT 27	OCT 11	SEPT 27
50	NOV 30	NOV 26	NOV 12	NOV 2	OCT 17	OCT 3
70	DEC 6	DEC 1	NOV 18	NOV 8	OCT 24	OCT 8
90	DEC 15	DEC 8	NOV 27	NOV 16	NOV 3	OCT 16

Heating degree days as shown in the above table are a measure of the departure of the average daily temperature from 65°F. When the average daily temperature is above 65°F, the degree day value for that day is zero. 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.

As is characteristic of continental climates, precipitation varies widely from year to year, however, it is normally abundant and well distributed throughout the year with spring being the wettest season. Chardon's average annual precipitation of 43.84 inches is about 7 inches above the mean for northeast Ohio. Showers and thunderstorms account for most of the rainfall during the growing season. Thunderstorms occur on about 35 days each year. Most of these occur April through August. Throughout much of Ohio, most precipitation during the winter months comes in the form of rain. Such is not the case, however, in the northern portion of Geauga County as this area is the heart of Ohio's "snow belt". Average annual snowfall within Geauga County varies from more than 100 inches in the north to about 50 inches in the south. Chardon's average annual snowfall of 106 inches is the highest known mean within the state. As is typical of all of Ohio, seasonal snowfall at Chardon is subject to wide variations from the annual mean. During the period 1946-1967, as little as 44.9 inches fell in the winter of 1959-60. About 1 of 3 winters Chardon will have at least 125 inches of snow.

Evaporation is greatest during the warm months and is then most critical for agriculture. During the period May through September, potential pan evaporation exceeds the normal rainfall by about 10 inches. During the driest growing season of record, 1963, the pan evaporation exceeded the rainfall by more than 20 inches. When evaporation exceeds rainfall for prolonged periods, a drought may occur, however, severe droughts seldom occur in Geauga County.

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 about 80% at 1 and 7 PM, 60% at 1 PM, and 70% at 7 PM. Cloudiness is greatest in winter and least in summer. This seasonal variation is most clearly illustrated by the monthly percentage of possible sunshine which is about 70% in July and less than 30% in December and January. Heavy fog occurs about 20 times each year and is most frequent during the cold half of the year. Death from smog is unknown. Prevailing wind direction for the year is from the southwest averaging about 10 mph. 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 1800, 2 such storms have been reported in Geauga County. During the last decade, Ohio has averaged slightly more than 11 tornadoes a year.

March 1968
 Marvin E. Miller
 ESSA Weather Bureau State Climatologist
 Box 357
 Columbus, Ohio 43216

STATION HISTORY

DATE	LOCATION	ELEVATION	OBSERVER
Date	(From Post Office)	(Ft. MSL)	Observer
3/45-Present	0.2 mile SE	1260	Jack Maynard

AVERAGE TEMPERATURE (°F)

TOTAL PRECIPITATION (INCHES)

YR	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ANNU
46	27.6	28.1	48.6	47.1	59.8	65.6	71.2	66.2	65.6	57.4	49.7	32.2	50.7
47	70.5	20.8	30.0	46.0	54.4	65.2	68.0	75.4	65.2	60.5	36.5	29.3	48.5
48	19.1	27.9	37.7	52.2	55.4	61.4	71.3	69.5	66.3	49.1	45.2	32.3	49.2
49	35.0	33.1	36.7	46.2	60.0	71.3	74.2	70.0	59.3	58.3	46.0	33.4	51.3
50	35.1	27.0	30.5	40.7	58.9	66.7	68.8	68.3	61.8	55.7	36.2	24.6	47.9
51	28.1	28.2	36.0	45.7	59.4	67.0	70.2	68.4	60.7	55.1	33.5	26.8	46.4
52	28.9	29.9	34.1	48.3	59.3	68.5	71.2	69.6	62.3	47.1	42.5	31.9	49.7
53	31.1	31.2	37.2	48.2	58.2	68.2	71.2	68.7	64.4	52.2	42.6	27.7	49.7
54	28.8	28.9	36.2	45.8	59.3	65.2	70.7	68.0	64.0	52.1	36.9	27.3	49.9
55	28.1	29.0	33.7	44.5	54.7	66.5	69.2	68.5	58.7	55.9	41.3	35.3	48.6
56	28.1	29.0	33.7	44.5	54.7	66.5	69.2	68.5	58.7	55.9	41.3	35.3	48.6
57	21.7	31.0	36.3	45.0	57.9	67.9	69.9	67.8	62.5	49.3	40.7	33.1	48.9
58	25.6	20.4	33.4	48.7	59.8	62.2	70.1	67.8	62.9	51.9	42.6	21.2	46.9
59	21.8	27.0	33.7	47.9	62.1	67.2	71.0	73.4	66.3	52.0	37.1	33.0	49.4
60	28.3	27.1	24.3	51.7	56.2	65.3	68.0	70.4	65.6	52.1	43.1	23.1	48.0
61	21.2	31.9	37.7	47.2	54.1	64.5	70.0	69.9	68.1	55.4	41.4	28.5	48.7
62	22.2	25.4	33.1	48.8	63.2	67.2	68.8	69.4	59.9	53.5	39.9	24.7	47.9
63	18.4	19.3	37.7	47.9	53.1	67.3	71.0	69.3	60.7	60.6	42.4	21.8	47.5
64	28.9	28.2	36.3	48.2	63.1	65.8	71.7	69.6	62.8	59.0	44.2	30.9	48.4
65	25.0	28.2	30.9	48.4	63.1	65.8	71.7	69.6	62.8	59.0	44.2	30.9	48.4
66	28.6	28.2	38.0	45.4	52.6	69.0	73.9	69.1	60.7	50.4	41.8	29.5	48.5
67	30.6	23.9	38.4	48.7	61.8	70.5	68.2	62.5	59.8	59.1	35.4	24.5	48.1

YR	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ANNU
46	1.58	2.46	3.54	1.38	7.12	3.42	1.43	1.66	1.14	4.54	3.01	2.82	34.10
47	4.65	2.15	3.08	2.82	6.46	3.21	2.23	4.61	1.85	3.92	3.45	2.73	48.17
48	2.54	2.89	4.79	2.89	4.00	1.93	4.13	2.53	3.08	1.75	3.51	3.29	35.27
49	3.26	2.81	5.48	6.01	2.93	3.54	6.82	3.63	5.51	2.51	8.33	2.62	59.17
50	1.38	4.81	5.48	6.01	2.93	3.54	6.82	3.63	5.51	2.51	8.33	2.62	59.17
51	3.67	3.92	6.04	3.93	2.60	3.26	4.33	2.19	2.75	2.53	6.91	5.94	47.67
52	5.32	2.86	3.23	4.32	3.78	3.74	2.08	7.79	3.07	1.62	3.48	3.03	44.32
53	4.24	1.49	3.21	3.88	7.00	3.44	2.59	2.28	2.06	1.23	3.01	4.03	39.03
54	3.49	2.16	4.18	7.12	1.95	1.74	1.66	3.12	2.80	2.97	3.28	50.35	
55	2.50	2.94	4.52	4.26	2.06	3.68	4.17	5.43	2.00	7.60	4.31	1.85	45.32
56	2.30	4.35	4.72	5.11	4.79	3.55	5.77	8.07	2.62	1.73	2.72	3.04	47.71
57	3.47	2.02	2.05	8.07	4.64	6.06	2.38	1.69	3.36	3.92	5.58	4.46	42.70
58	2.45	1.73	1.37	3.65	2.39	5.10	1.33	10.12	2.18	2.54	4.01	1.92	54.44
59	5.85	4.15	3.22	5.66	4.38	4.57	4.82	2.80	2.22	1.65	3.79	2.38	41.91
60	4.38	3.24	2.36	3.25	5.80	5.81	4.42	2.80	2.22	1.65	3.79	2.38	41.91
61	3.08	4.23	3.83	7.52	1.94	5.94	3.31	3.51	1.81	3.63	3.72	3.09	43.52
62	1.97	2.70	2.37	1.97	2.34	2.91	3.28	2.35	5.86	4.35	3.35	3.09	40.15
63	1.51	1.38	3.46	2.79	2.25	2.02	2.60	2.30	1.21	1.13	5.41	2.21	28.27
64	2.92	2.16	6.03	5.84	3.20	2.02	3.73	4.40	2.40	2.26	1.66	3.56	39.59
65	5.79	3.42	3.02	2.64	2.81	4.09	2.08	3.97	2.58	5.23	3.20	2.47	41.60
66	3.11	2.51	3.75	4.58	2.25	2.04	1.90	5.74	2.77	2.82	7.28	4.21	42.54
67	2.71	2.58	2.54	3.82	4.71	4.07	7.45	3.53	3.83	3.78	5.21	2.41	46.54

MONTHLY AND SEASONAL SNOWFALL

PRECIPITATION WITH PROBABILITY EQUAL OR LESS THAN

SEASON	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	TOTAL
46-47	.0	.0	.0	15.5	12.3	4.5	5.7	.0	.0	110.8
47-48	.0	.0	12.5	5.5	35.5	4.5	7.5	.0	.0	65.5
48-49	.0	.0	1.0	9.0	9.5	6.4	4.5	.0	.0	44.9
49-50	.0	.0	26.0	16.0	22.0	23.0	12.5	.0	.0	109.5
50-51	.0	.0	36.5	23.3	30.8	22.5	21.1	.0	.0	140.8
51-52	.0	.0	28.8	37.5	20.5	10.6	7.5	.0	.0	113.6
52-53	.0	2.0	8.0	26.0	14.5	10.6	6.6	.0	.0	66.6
53-54	.0	.0	14.0	27.0	17.5	10.5	13.5	.0	.0	103.5
54-55	.0	13.0	11.5	34.5	23.5	19.5	13.5	.0	.0	115.5
55-56	.0	.0	21.0	32.0	18.0	21.0	9.5	.0	.0	119.5
56-57	.5	.0	17.0	19.5	42.5	11.5	13.2	24.5	.0	139.7
57-58	.0	8.0	14.5	22.5	30.5	12.2	12.2	1.2	.0	100.3
58-59	.0	12.5	36.5	10.5	38.5	4.5	1.3	.0	.0	134.8
59-60	.0	15.0	20.0	21.3	44.2	4.0	10.0	.0	.0	161.5
60-61	.0	.0	11.0	44.0	17.1	5.5	16.0	.0	.0	105.6
61-62	.0	.0	5.0	13.2	9.7	27.0	16.8	2.0	.0	73.7
62-63	.0	9.0	16.0	14.1	35.2	33.3	14.7	2.7	.0	147.5
63-64	.0	.0	3.7	20.2	35.7	27.0	1.7	1.7	.0	127.0
64-65	.0	.0	6.0	9.9	46.4	10.0	28.4	9.1	.2	110.7
65-66	.0	.0	1.5	12.3	13.3	30.1	15.3	2.1	.0	98.7
66-67	.0	.0	1.5	29.0	11.0				.0	
67-68	.0	.0	1.5	29.0	11.0				.0	

SEASON	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	TOTAL
46-47	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90
47-48	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90
48-49	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90
49-50	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90
50-51	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90
51-52	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90
52-53	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90
53-54	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90
54-55	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90
55-56	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90
56-57	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90
57-58	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90
58-59	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90
59-60	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90
60-61	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90
61-62	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90
62-63	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90
63-64	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90
64-65	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90
65-66	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90
66-67	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90
67-68	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90

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