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. 20-33-78

LATITUDE 40°44' N
LONGITUDE 82°22' W
ELEV. (GROUND) 1025 Ft.

CLIMATOLOGICAL SUMMARY

STATION: Charles Mill Dam, O.

MEANS AND EXTREMES FOR PERIOD 1939-1965

	TEMPERATURE (°F)															PRECIPITATION TOTALS (INCHES)																
	MEANS			EXTREMES							MEAN NUMBER OF DAYS											SNOW, SLEET						MEAN NUMBER OF DAYS				
											MAX.		MIN.																			
MONTH	DAILY MAXIMUM	DAILY MINIMUM	MONTHLY	RECORD HIGHEST	YEAR	DAY	RECORD LOWEST	YEAR	DAY	MEAN DEGREE DAYS **	90° AND ABOVE	32° AND BELOW	32° AND BELOW	0° AND BELOW	MEAN	GREATEST MONTHLY	YEAR	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	MONTH
JAN	34.9	18.0	26.4	72	50	25	-20*	63	24	1190.	0	13	27	3	2.42	8.07	50	2.08	59	21	7.8	25.0	64	16.0	64	13	11	6	1.2	.2	JAN
FEB	37.1	18.5	27.8	70	44	25	-28	63	26	1047.	0	9	25	2	2.18	4.38	56	2.05	59	10	7.2	14.5	62	7.0	51	1	10	4	1.2	.2	FEB
MAR	45.7	25.8	35.7	81	45	25	-15	41	12	903.	0	4	23	0	3.26	8.36	64	2.47	39	12	7.1	17.9	54	13.0	54	1	13	7	2.0	.5	MAR
APR	58.6	35.5	47.0	88	42	26	1	64	1	539.	0	0	12	0	3.35	5.91	64	1.97	59	27	1.1	6.0	61	3.0	61	17	13	7	1.9	.4	APR
MAY	70.2	45.6	57.9	91*	62	19	23*	63	2	250.	0	0	2	0	3.74	7.62	46	2.93	57	20	.0						12	8	2.5	.5	MAY
JUNE	79.3	54.8	67.0	100	52	27	32	58	7	66.	2	0	0	0	4.05	9.79	47	3.63	46	12	.0						10	7	2.3	1.0	JUNE
JULY	83.0	57.7	70.3	99	41	28	38	63	9	20.	4	0	0	0	3.70	8.59	58	2.81	51	23	.0						9	6	2.3	1.0	JULY
AUG	81.6	56.0	68.8	99	48	27	33	46	30	34.	3	0	0	0	2.90	5.35	50	2.95	50	1	.0						8	5	2.1	.7	AUG
SEPT	75.9	49.3	62.6	100*	53	4	25	42	29	146.	1	0	1	0	2.67	8.86	57	3.85	57	21	.0						8	5	1.9	.5	SEPT
OCT	65.0	39.3	52.1	88	53	4	12	64	11	405.	0	0	8	0	2.11	5.01	54	2.22	41	7	.0	.5	52	.5	52	20	9	5	1.2	.2	OCT
NOV	49.5	30.4	39.9	80	50	1	-4	58	30	749.	0	2	18	0	2.32	4.80	51	2.70	55	16	2.4	16.5	50	6.0	58	29	10	5	1.1	.2	NOV
DEC	37.4	21.1	29.2	70	56	7	-16*	58	11	1105.	0	10	26	2	2.13	4.70	51	1.10	52	10	7.0	17.0	51	10.0	44	11	10	5	1.5	.0	DEC
YEAR	59.8	37.6	48.7	100	52	JUNE 27	-28	63	FEB 26	6454.	10	38	142	7	34.83	9.79	JUNE 47	3.85	SEPT 57	21	32.6	25.0	JAN 64	16.0	JAN 64	13	123	70	21.	5.	YEAR

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

NARRATIVE CLIMATOLOGICAL SUMMARY

Charles Mill Dam is located in the west central portion of Ashland County in Ohio's Central Hills. Terrain within Ashland County is gently rolling to hilly. The elevation of the earth's surface above mean sea level varies from about 940 to 1380 feet. A map of the physiographic regions of Ohio shows the northern third of Ashland County to be a part of Ohio's Till Plains while the remainder of the county is within Ohio's Glaciated Plateau. The glaciation which occurred in this latter region has reduced the steep slopes and filled the valleys, thus transforming rough preglacial topography to one of more subdued character.

The climate of Ashland County is marked by large annual, daily, and day to day ranges in temperature. Summers in this area are moderately warm and humid with occasional days of temperatures in the nineties. Winters are reasonably cold and cloudy with an average of 7 days with subzero temperatures. Weather changes occur every few days from the passing of cold or warm fronts and their associated centers of high and low pressures.

As is characteristic of continental climates, precipitation in the Charles Mill Dam area varies widely from year to year, however, it is normally abundant and well distributed throughout the year with fall being the driest season. Charles Mill Dam's average annual precipitation is about 2.5 inches below the mean for Ohio's Central Hills area. Showers and thundershowers account for most of the rainfall during the growing season. Thunderstorms occur on about 40 days each year and are most frequent from April through August. Heavy rains of 2.0, 2.8, 3.3, 3.8, 4.3, and 4.7 inches in 24-hours can be expected to occur at least once every 2, 5, 10, 25, 50, and 100 years, respectively. Mean annual snowfall within Ashland County varies from about 30 inches in the south to 37 inches over the northeast. As is typical of much of Ohio, most precipitation during the winter months comes in the form of rain. Snowfall is subject to wide fluctuations from the annual means.

Evaporation is greatest during the warm months and is then most critical for agriculture. When evaporation greatly exceeds precipitation for prolonged periods, a drought may occur. During the period 1929-1968, extended periods of moderate to extreme drought in Ohio's Central Hills as determined from the Palmer Drought Severity Index have occurred during the 1930, 1931, 1934, 1941, 1944, 1953, 1954, 1962, and 1963 growing seasons. The longest continuing period of moderate to extreme drought in Ohio's Central Hills is 24 months (October 1952-September 1954). 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 AM, 60% at 1 PM, and 70% at 7 PM. During summer afternoons, the relative humidity is often in the 50-60% range. Cloudiness is greatest in winter and least in summer. This seasonal variation in cloudiness is most clearly illustrated by the percentage of possible sunshine which is about 70% in July and 30% in December. Fog that reduces visibility to less than 1/4 mile is most frequent in fall and winter. Damaging winds of 35 to 85 mph 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 often by lightning and thunder. Since 1900, only one tornado has been reported in Ashland County. During the period 1953-1968, Ohio has averaged about 10 tornadoes per year.

Charles Mill Dam's normal mean temperature for the year is nearly two degrees below the average for Ohio's Central Hills. In 8 of 10 years, the average annual temperature is in the 46.8° F to 50.7° F range. On nights with clear skies and light winds there is often a large variation in observed surface temperatures within Ashland 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 into the valleys. The drainage often results in large differences in surface temperatures between valley floors and the tops of hills. The daily range in temperature is usually greatest in late summer and early fall and least in winter. Annual extremes in temperature normally occur soon after June 21 and December 22. The highest temperature during the year at the Charles Mill Dam is equal to or greater than 90° F in 9 of 10 years, 94° F in 5 of 10 years, and 98° F in 1 of 10 years. Lowest temperature during the year is equal to or less than -1° F in 9 of 10 years, -10° F in 5 of 10 years, and -19° F in 1 of 10 years.

Heating degree days (mean 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.

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 140 days at the Charles Mill Dam. The growing season is longer than 159 days in 10% of the years and shorter than 121 days in 10% of the years. Similar information for other locations in Ashland County may vary considerably from the above data due to differences in topography.

Marvin E. Miller
April 1969 MIC WBO/State Climatologist
Box 15307, Civic Center Station
Columbus, Ohio 43215

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 4	MAR 21	APR 3	APR 14	APR 25	MAY 9
70	MAR 14	MAR 29	APR 11	APR 23	MAY 5	MAY 18
50	MAR 21	APR 3	APR 17	APR 29	MAY 12	MAY 25
30	MAR 28	APR 9	APR 23	MAY 5	MAY 19	MAY 31
10	APR 7	APR 16	MAY 2	MAY 14	MAY 29	JUNE 9
PERCENT CHANCE OF EARLIER DATE IN FALL						
10	NOV 1	OCT 24	OCT 9	SEPT 26	SEPT 18	SEPT 5.
30	NOV 14	OCT 31	OCT 19	OCT 5	SEPT 25	SEPT 12
50	NOV 22	NOV 6	OCT 26	OCT 11	SEPT 30	SEPT 17
70	DEC 1	NOV 11	NOV 2	OCT 17	OCT 4	SEPT 22
90	DEC 14	NOV 19	NOV 12	OCT 26	OCT 11	SEPT 29

STATION HISTORY

DATE	LOCATION	ELEVATION	OBSERVER
Date	Location (From Post Office)	Elevation (Ft. MSL)	Observer
5/1936-Present	Charles Mill Dam on State Route 603	1025	U. S. Corps of Engineers H. W. Schrack current dam operator

AVERAGE TEMPERATURE (°F)

YR	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ANNL
39	33.0	32.4	39.5	44.0	60.0	70.8	70.4	70.8	67.3	52.5	37.6	32.5	50.9
40	13.1	26.0	30.6	42.5	55.4	67.6	71.3	70.2	59.3	50.6	37.7	33.4	46.5
41	26.8	22.7	26.1	51.3	58.9	68.3	73.1	67.4	65.4	54.9	41.2	34.5	49.2
42	25.6	22.2	37.8	49.3	58.4	67.9	71.4	68.1	61.7	53.4	41.5	25.8	48.6
43	27.7	29.9	34.7	42.2	59.0	72.9	71.8	69.2	60.0	49.5	36.0	27.4	48.4
44	31.3	29.1	35.0	45.5	64.3	70.0	71.1	71.0	61.9	50.5	40.8	24.0	49.6
45	19.4	28.2	48.0	49.8	52.9	64.3	68.8	69.0	65.6	50.2	41.4	23.7	48.4
46	28.6	30.8	48.4	46.7	56.4	65.7	69.2	63.7	62.9	54.6	43.2	32.3	50.2
47	32.5	20.9	30.8	48.5	55.6	66.1	67.4	75.2	64.4	58.8	37.4	30.5	49.0
48	18.9	28.3	39.7	52.6	55.9	66.6	71.9	68.6	64.6	48.6	45.8	33.6	49.6
49	36.1	34.4	38.2	45.6	59.4	71.1	75.1	70.6	57.6	56.2	40.7	33.8	51.6
50	37.8	30.6	33.4	42.4	58.9	65.3	68.6	66.8	61.6	55.3	35.8	23.5	48.3
51	29.3	28.4	37.0	45.5	59.2	67.0	70.4	68.4	61.1	54.1	34.3	29.9	48.7
52	32.8	32.3	35.8	49.0	56.3	71.7	73.7	69.0	62.9	47.1	42.6	33.9	50.6
53	32.5	33.0	38.7	44.3	61.0	69.4	71.0	68.7	62.2	53.4	41.7	32.8	50.7
54	28.4	34.7	34.0	52.4	54.4	69.5	69.5	68.8	65.2	54.6	39.8	30.1	50.1
55	25.7	28.9	38.2	53.6	60.0	63.4	74.5	73.1	64.0	52.6	37.2	26.8	49.9
56	25.0	30.4	34.8	44.3	56.0	66.1	69.3	68.5	59.4	54.3	40.5	37.1	48.8
57	21.6	32.1	36.3	48.6	57.9	67.4	69.7	68.5	62.4	49.3	40.7	33.4	49.0
58	25.3	20.7	34.6	48.8	55.3	61.9	71.0	67.1	61.8	51.4	43.1	20.2	46.8
59	21.7	27.5	34.3	47.0	61.4	65.9	70.5	72.3	65.2	51.6	37.4	34.5	49.1
60	30.1	28.8	23.8	52.1	56.5	64.9	67.4	70.2	65.0	49.9	40.6	21.5	47.5
61	19.8	30.8	39.9	41.3	52.5	63.7	69.5	69.4	66.7	53.4	40.2	28.1	47.9
62	23.1	25.1	32.9	44.7	63.7	67.4	68.6	67.5	58.5	51.1	37.5	22.7	46.9
63	16.7	16.5	37.1	46.2	52.9	65.0	68.7	63.8	57.7	55.2	41.9	19.7	45.1
64	25.8	21.5	35.0	47.9	59.8	65.5	70.5	65.9	61.7	46.7	41.7	29.3	47.6
65	25.3	24.7	31.1	45.0	62.2	65.0	66.2	66.3	64.0	48.3	40.7	34.6	47.8
66	**20.7**	**26.8**	**38.3**	**45.7**	**51.7**	**66.0**	**70.7**	**66.9**	**59.2**	**46.8**	**40.8**	**28.5**	**46.8**
67	**30.1**	**23.0**	**35.2**	**48.3**	**52.1**	**68.2**	**67.8**	**66.6**	**57.3**	**49.5**	**34.9**	**30.8**	**47.0**
68	**19.0**	**20.5**	**36.1**	**47.9**	**53.2**	**65.6**	**69.3**	**69.3**	**62.7**	**51.1**	**41.0**	**27.6**	**46.9**
69	**24.1**	**26.7**											

TOTAL PRECIPITATION (INCHES)

YR	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ANNL
39	2.12	2.84	4.54	2.73	1.66	2.96	1.79	2.13	1.32	2.87	.54	.90	26.41
40	1.12	2.70	2.94	4.56	3.49	8.58	1.74	4.44	1.13	1.96	3.10	3.05	38.81
41	1.65	.68	.74	1.11	3.36	3.83	1.81	3.60	1.30	4.66	2.20	1.44	26.38
42	1.33	2.47	2.42	2.41	3.00	5.36	2.36	2.78	3.70	2.48	3.16	3.36	34.83
43	1.74	1.71	3.55	2.24	6.89	2.10	4.95	3.36	2.50	1.12	.81	.69	31.66
44	.76	1.46	3.75	4.11	4.52	4.79	.94	4.02	1.60	1.58	1.35	2.40	31.30
45	.60	2.38	6.12	3.63	4.79	5.96	2.36	.83	6.33	2.73	2.71	1.67	40.11
46	.71	2.09	2.38	1.00	7.62	6.84	2.92	1.81	1.55	3.91	2.83	3.07	37.53
47	4.73	.31	1.72	5.82	5.54	9.79	3.42	3.54	2.94	2.22	1.98	1.59	43.60
48	1.41	2.48	4.02	3.64	3.73	4.68	1.72	3.11	2.15	2.42	3.46	2.89	35.71
49	4.25	2.34	2.52	2.53	3.44	2.63	3.80	4.59	2.63	1.02	1.00	3.03	33.78
50	8.07	4.28	3.08	2.57	2.61	2.82	2.67	5.35	4.06	1.65	3.79	2.62	43.57
51	2.99	2.74	4.22	3.16	2.00	3.42	5.30	.71	3.68	.85	4.80	4.70	38.57
52	5.17	1.88	3.22	3.07	1.94	.94	6.05	1.39	2.77	.90	1.44	2.58	31.35
53	3.00	1.38	1.91	2.45	4.91	1.00	6.34	1.55	1.83	.43	1.05	1.80	27.65
54	1.42	1.23	3.49	4.45	.89	3.88	2.25	3.24	1.23	5.01	1.24	1.76	30.09
55	1.30	2.36	5.04	2.99	2.50	1.66	5.43	3.28	3.16	3.18	4.42	.16	35.48
56	1.31	4.38	3.97	2.24	7.16	4.68	6.46	1.89	2.19	.65	1.29	2.89	39.11
57	2.13	1.64	1.64	5.62	7.13	7.79	3.20	.41	8.86	1.41	2.90	4.43	47.16
58	1.60	.69	1.27	4.25	3.23	4.94	8.59	5.22	3.06	.94	2.53	.57	36.89
59	6.30	3.73	2.37	5.19	3.31	2.39	4.12	1.89	1.48	4.64	3.43	2.36	41.21
60	2.25	2.62	1.41	2.46	4.30	3.18	3.09	2.36	.50	1.76	2.16	1.14	27.23
61	.77	2.91	3.51	4.97	1.44	6.21	5.07	2.64	4.24	1.38	3.09	1.98	38.21
62	2.85	2.16	2.33	1.02	2.91	1.62	4.71	3.79	4.39	2.25	2.39	1.63	32.05
63	.92	.60	4.94	3.28	1.93	1.91	4.73	3.48	.79	.03	1.47	.88	24.96
64	2.10	1.44	8.36	5.91	4.03	2.69	2.21	2.27	.70	1.01	1.18	3.33	35.23
65	2.84	2.68	2.66	3.23	2.90	2.88	1.87	4.75	2.24	4.01	2.54	.75	33.35
66	**2.74**	**2.24**	**1.83**	**3.58**	**3.08**	**3.00**	**6.05**	**3.32**	**2.65**	**1.25**	**4.17**	**2.81**	**36.72**
67	**.60**	**2.11**	**4.14**	**2.83**	**4.73**	**1.39**	**2.25**	**1.31**	**3.63**	**1.32**	**2.66**	**3.57**	**30.54**
68	**2.94**	**.44**	**2.52**	**2.30**	**8.03**	**5.89**	**3.38**	**1.69**	**1.98**	**1.49**	**4.27**	**4.06**	**38.99**
69	**3.59**	**.85**											

MONTHLY AND SEASONAL SNOWFALL

SEASON	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	TOTAL
39-40	.0	.0	.0	2.9	9.9	12.6	7.5	1.8	.0	34.7
40-41	.0	.0	2.4	2.7	11.1	8.2	4.5	.0	.0	28.9
41-42	.0	.0	1.6	1.8	4.0	5.8	7.8	.0	.0	21.0
42-43	.0	.0	.5	8.0	4.6	2.9	3.3	1.3	.0	20.6
43-44	.0	.0	1.0	.0	1.3	13.7	4.9	2.5	.0	23.4
44-45	.0	.0	.3	15.8	13.6	5.2	.2	.0	.0	35.1
45-46	.0	.0	1.0	12.0	1.0	3.0	1.0	.0	.0	18.0
46-47	.0	.0	.0	5.0	2.0	9.0	11.0	.0	.0	27.0
47-48	.0	.0	.3	3.8	18.7	5.5	5.0	.0	.0	33.3
48-49	.0	.0	.0	2.2	2.9	1.5	11.2	.0	.0	17.8
49-50	.0	.0	.0	5.1	1.0	3.2	4.8	2.5	.0	16.6
50-51	.0	.0	16.5	14.3	9.8	9.0	9.0	.0	.0	58.6
51-52	.0	.0	4.5	17.0	7.8	3.9	7.3	1.2	.0	41.7
52-53	.0	.5	.8	6.2	9.1	4.9	5.0	3.4	.0	29.9
53-54	.0	.0	4.3	5.3	4.3	4.8	17.9	.0	.0	36.6
54-55	.0	.0	4.7	7.0	5.7	10.0	6.3	.0	.0	33.7
55-56	.0	.0	4.5	3.0	8.5	8.0	9.8	4.0	.0	37.8
56-57	.0	.0	2.5	17.0	6.4	3.7	7.0	5.0	.0	41.6
57-58	.0	.0	.0	2.4	7.0	4.5	6.0	.0	.0	19.9
58-59	.0	.0	7.0	9.5	15.1	1.6	13.4	.0	.0	46.6
59-60	.0	.0	9.0	5.0	1.0	11.5	12.0	.0	.0	38.5
60-61	.0	.0	2.0	15.1	7.5	9.5	.7	6.0	.0	40.8
61-62	.0	.0	1.0	5.0	4.0	14.5	10.5	2.0	.0	37.0
62-63	.0	.0	.0	11.0	7.0	8.0	12.0	.0	.0	38.0
63-64	.0	.0	.0	7.0	25.0	13.0	5.1	1.0	.0	51.1
64-65	.0	.0	1.2	6.8	10.0	8.5	7.7	.0	.0	34.2
65-66	**.0**	**.0**	**.5**	**.0**	**8.0**	**4.9**	**2.0**	**.2**	**1.0**	**16.6**
66-67	**.0**	**.0**	**5.0**	**2.0**	**.5**	**16.6**	**14.0**	**.0**	**.0**	**38.1**
67-68	**.0**	**.0**	**.5**	**9.0**	**17.0**	**4.0**	**4.0**	**.0**	**.0**	**34.5**
68-69	**.0**	**.0**	**.0**	**3.5**	**2.0**	**3.4**				

PRECIPITATION WITH PROBABILITY EQUAL OR LESS THAN

	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
JAN	.50	.73	1.08	1.41	1.73	2.08	2.47	2.94	3.57	4.56	5.50
FEB	.67	.88	1.18	1.45	1.71	1.97	2.27	2.61	3.06	3.75	4.39
MAR	1.16	1.47	1.92	2.29	2.64	3.01	3.41	3.87	4.46	5.37	6.21
APR	1.34	1.65	2.09	2.45	2.79	3.14	3.51	3.94	4.49	5.34	6.10
MAY	1.33	1.68	2.19	2.62	3.03	3.45	3.91	4.45	5.13	6.18	7.15
JUN	1.16	1.55	2.13	2.63	3.12	3.64	4.20	4.87	5.74	7.10	8.36
JUL	1.26	1.61	2.12	2.56	2.97	3.39	3.86	4.40	5.09	6.17	7.16
AUG	.90	1.17	1.58	1.94	2.28	2.63	3.02	3.47	4.06	4.98	5.82
SEP	.63	.88	1.27	1.62	1.97	2.34	2.75	3.24	3.88	4.90	5.86
OCT	.32	.50	.80	1.09	1.40	1.73	2.11	2.57	3.20	4.20	5.17
NOV	.78	1.00	1.32	1.60	1.86	2.13	2.42	2.76	3.20	3.87	4.48
DEC	.51	.71	1.03	1.30	1.58	1.87	2.19	2.58	3.09	3.89	4.63
ANN	26.08	27.82	30.03	31.70	33.17	34.58	36.04	37.64	39.58	42.37	44.78

Median 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 incomplete gamma distribution whose curve has been found to give best fits to precipitation climatological series.