

U. S. DEPARTMENT OF COMMERCE
 ENVIRONMENTAL SCIENCE SERVICE ADMINISTRATION
 IN COOPERATION WITH THE PENNSYLVANIA DEPARTMENT OF COMMERCE
 CLIMATOGRAPHY OF THE UNITED STATES NO. 20 - 36

LATITUDE 41°04'
 LONGITUDE 80°04'
 EV. (GROUND) 1260 ft.

CLIMATOLOGICAL SUMMARY

STATION Slippery Rock, Pennsylvania

MEANS AND EXTREMES FOR PERIOD May 1949 - March 1970

Month	Temperature (°F)								** Mean degree days (20)	Precipitation Totals (Inches)						Mean number of days					Month				
	Means				Extremes					Mean	Greatest daily (20)	Year	Snow, Sleet			Precip. .10 inch or more (20)	Temperatures								
	Daily maximum (20)	Daily minimum (20)	Monthly (20)	Record highest (20)	Year	Record lowest (20)	Year	Mean (20)					Maximum monthly (20)	Year	Greatest daily (20)		Year	90° and above (20)	32° and below (20)	32° and below (20)		Max.		Min.	
																						90° and above (20)	32° and below (20)	32° and below (20)	0° and below (20)
Jan.	34.9	18.1	26.5	72	1950	-18	1963	1213	2.92	1.40	1965	11.3	19.0	1964	13.0	1961	6	0	14	28	3	Jan.			
Feb.	37.4	19.3	28.4	69	1961	-14	1963	1034	2.50	1.42	1950	9.8	25.5	1960	11.0	1960	6	0	9	26	2	Feb.			
Mar.	45.8	26.3	36.1	78	1950	-4	1960	884	3.02	1.88	1964	8.7	25.5	1960	14.0	1961	7	0	4	23	*	Mar.			
Apr.	59.7	37.7	48.7	88	1963	16	1950	472	3.89	1.55	1955	1.5	7.0	1957	3.0	1957	9	0	*	11	0	Apr.			
May	70.6	46.3	58.5	92	1962	25	1966	225	3.68	1.60	1960						8	*	0	2	0	May			
June	79.5	55.0	67.3	99	1952	33	1966	55	4.19	1.92	1964						7	2	0	0	0	June			
July	82.9	59.0	71.0	98	1966	40	1968	12	3.74	2.80	1964						7	4	0	0	0	July			
Aug.	81.2	57.0	69.1	99	1953	34	1963	24	3.02	2.50	1952						6	2	0	0	0	Aug.			
Sept.	74.6	50.7	62.7	99	1953	30	1957	123	3.05	2.70	1954	*	0.4	1954	0.4	1954	5	1	0	*	0	Sept.			
Oct.	64.8	41.3	53.1	88	1951	17	1965	381	2.54	3.85	1954	*	1.0	1962	1.0	1962	6	0	0	5	0	Oct.			
Nov.	49.5	32.1	40.8	81	1961	-1	1958	701	3.07	1.80	1950	4.3	28.4	1950	17.0	1950	8	0	2	17	0	Nov.			
Dec.	37.5	22.1	29.8	67	1956	-10	1951	1079	2.57	1.48	1968	11.3	29.7	1969	12.0	1951	7	0	12	26	1	Dec.			
Year	59.8	38.7	49.3	99	Sept. 1953+	-18	Jan. 1963	6203	38.19	3.85	Oct. 1954	46.9	29.7	Dec. 1969	17.0	Nov. 1950	82	9	41	138	6	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

CLIMATE OF SLIPPERY ROCK, PENNSYLVANIA

Slippery Rock is located in the northwest corner of Butler County just 5 miles north of the Moraine State Park recreational area. Surrounding topography is rolling and hilly with elevations fluctuating between 1100 and 1400 feet msl. The climatic data for Slippery Rock should be representative of that at Moraine State Park.

The climate is characterized as Humid Continental. Most weather systems that affect the Slippery Rock area originate in Canada or the Central Plains of the United States and are moved eastward by the prevailing westerlies. Canadian air is usually modified somewhat by the time it reaches the western border of Pennsylvania, acquiring some of the characteristics of the land mass it has traversed. The primary moisture source is the Gulf of Mexico although minor effects of the Great Lakes, Lake Erie in particular, are sometimes experienced.

Cold fronts move through the area every few days in the summer, thus minimizing the threat of prolonged hot and humid weather. Daytime highs average in the lower 80's while nighttime lows generally drop into the pleasantly cool upper 50's. Temperatures reach 90° on about 9 days annually. In the relatively short history of this station 100° has not been observed, but 99° has been recorded on a few occasions. Nighttime temperatures have dropped into the 30's in June and August, but such occurrences are rare. Cloud cover is at a minimum during the summer with better than 60 percent of available sunshine received while nights are generally clear. The prevailing wind this time of the year is southwest at 8 mph. Rainfall is adequate, falling for the most part as a result of afternoon and evening thundershowers which occur on the average of 23 days from June through August.

Winters are rather cloudy and cold, due to the increased frequency of cold fronts. Prevailing winds are west-southwest at 10 mph. Daytime highs average in the mid 30's with nighttime lows usually near 20°. Sixty and seventy-degree temperatures have been observed in the dead of winter, but such occurrences are very infrequent and short-lived. Sub-zero readings are observed on about 6 days each winter. A record low of -18° was recorded on January 24, 1963.

The first snowfall of any consequence usually occurs in November or early December. While most storms are limited to a total snowfall of less than 10 inches a few have exceeded 15 inches. The greatest daily snowfall was 17 inches on November 25, 1950, and the highest monthly total was 29.7 inches in December 1969. The 1969-70 winter produced the greatest total snowfall, 77.6 inches. Deep low pressure centers that develop in the Mississippi Valley or Central Plains and track east-northeastward just south of the Slippery Rock area are most conducive to heavy snows. Snow cover is persistent

during the winter season, a snow cover of an inch or more is observed 59 days a year. An average winter will find 12 days with a snow depth of 6 inches or more. After March the threat of snow tapers off rapidly.

Spring and fall are of course the transition periods. Prevailing winds are southwesterly at 10 mph. By the middle of May maximum temperatures average near 70° indicating a shift to the summer season. The fall month of October is for the most part quite pleasant with daytime highs still in the upper 60's and abundant sunshine emphasizing the autumnal change in colors.

The growing season averages 160 days, although the season has been as short as 125 days in 1969 or as long as 201 days in 1953. May 8th is the average date of the last spring frost with the latest observed on May 27, 1969. October 12th is the average date of the first fall frost with the earliest observed on September 17, 1959.

Fifty-six percent of the annual precipitation falls during the spring and summer. The greatest monthly total precipitation was 11.07 inches in June 1956, and the highest daily rain was 3.85 inches on October 16, 1954. The return period for 24 hour rains on the order of 4 inches is about 25 years. Thunderstorms occur most frequently in the summer but have been observed each month of the year. On the average such storms are observed on 11 days in the spring, 6 days in the fall, and once in the winter which, when combined with the summer statistics, results in an annual average of 41. With a strong dependence upon showers for the moisture supply in the summer and fall, there is always a threat of drought. Prolonged periods of drought are seldom experienced however, and the longest expected period without measurable rainfall is on the order of 25 to 30 days.

Damages due to wind and hail accompanying severe thunderstorms are recorded almost every year in Butler County. Since 1854 when records were first kept on such storms only 2 tornadoes have been sighted in Butler County, neither occurred near the Slippery Rock area nor caused death or injury although considerable property damage resulted. Butler County apparently is located in one of the less-vulnerable severe weather locales in the state; and thus while it is always possible that a tornado could occur in the Slippery Rock area, the odds are heavily against it.

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 May 1970

Total Precipitation (Inches)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Ann'l
1949	6.60	4.11	3.62	5.26	3.71	2.33	4.52	1.85	3.29	0.90	1.21	2.82	
1950													
1951	3.10	4.70	5.55	6.12	2.79	5.94	4.12	2.92	4.13				
1952	5.68	3.48	3.08	3.78	2.25	6.51	3.61	1.34	2.23	1.53	4.53	4.14	45.61
1953	3.28	1.24	3.84	3.69	6.32	2.98	2.37	4.39	4.48	1.24	2.17	2.09	42.06
1954	2.51	1.14	4.72	5.88	2.40	3.29	2.82	0.56	3.71	9.03	1.59	1.33	33.61
1955	1.41	2.72	4.19	4.31	3.26	2.40	2.15	3.37	4.97	9.03	1.13	2.79	47.73
1956	1.15	6.02	3.82	5.23	4.80	11.07	9.18	5.26	2.85	0.90	0.99	2.95	54.22
1957	2.07	1.72	1.65	4.83	3.60	3.61	2.25	1.20	3.10	1.46	2.22	4.36	32.11
1958	2.24	0.67	0.82	3.99	4.97	5.62	9.83	4.33	5.38	1.66	3.51	1.24	44.26
1959	4.06	3.36	1.83	4.43	3.11	2.96	4.18	2.06	0.49	5.80	3.85	3.45	39.58
1960	2.45	2.58	1.16	0.98	6.32	4.01	4.04	3.82	0.61	1.43	1.93	1.49	30.82
1961	1.08	3.17	2.46	5.05	3.08	3.59	3.30	1.97	2.28	2.24	3.42	1.45	33.09
1962	2.75	2.22	2.55	2.09	1.61	4.49	1.97	1.03	3.15	2.00	1.18	2.08	27.12
1963	1.20	1.50	2.84	2.69	2.96	3.12	2.01	2.29	2.53	0.31	3.41	1.16	26.02
1964	1.89	1.43	4.60	5.65	1.74	5.44	4.86	4.30	1.32	1.62	2.38	4.34	39.57
1965	5.85	3.39	3.81	1.97	1.24	2.40	2.91	3.38	6.20	4.02	3.38	1.76	40.31
1966	3.92	2.33	2.45	3.20	2.94	2.67	2.41	2.34	2.22	1.56	5.76	3.18	34.98
1967	0.89	3.23	4.27	2.82	3.45	1.22	3.81	6.47	2.25	4.02	3.32	4.03	38.50
1968	4.44	0.65	1.06	1.87	5.73	2.64	2.22	3.29	4.55	3.22	3.96	2.75	37.66
1969	2.78	0.59	1.16	3.94	3.50	3.06	4.69	3.20	2.31	3.50	2.81	3.91	35.45
1970	1.94	2.34	3.95										

SLIPPERY ROCK SUBSTATION HISTORY

The Slippery Rock station was established July 22, 1947 at the Slippery Rock Water Plant with Mr. R. K. Grine the initial observer. Mr. Grine was unable to devote the time to the position however, and the records over the first two years were inconsistent. The station was finally moved to the Slippery Rock State Teachers College Campus in April 1949 under the supervision of Dr. Walter D. Albert. Upon Dr. Albert's death a graduate student Mr. Raymond E. Miller took over in November 1960. Mr. Miller resigned in April 1967 and the station was moved to the Slippery Rock Sewage Plant where Mr. Charles F. Barnes took charge of observations. Mr. Barnes transferred in October 1967 and Mr. L. G. Stevenson assumed the duties. Mr. Stevenson in turn resigned and Mr. E. A. Fluger took over in March 1968. Mr. Fluger resigned in September 1968 relinquishing the observational duties to the present observer Mr. Melvin W. Sankey.

Average Temperature (°F)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Ann'l
1949	36.1	28.2	31.0	41.9	57.9	68.8	74.6	69.0	57.1	56.5	39.7	32.4	
1950	28.6	28.7	35.8	44.8	57.4	65.2	66.7	67.0	60.5	54.4	36.8	24.5	
1951	30.4	34.7	44.7	49.3	58.7	67.5	72.6	68.6	59.2	54.4	34.1	29.3	48.1
1952	34.1	33.3	39.7	45.5	55.4	69.1	72.6	70.6	63.4	48.3	43.9	34.5	50.1
1953	28.0	35.0	35.7	53.9	62.1	69.4	71.0	68.9	65.1	55.3	43.0	33.7	52.1
1954	25.1	30.4	39.2	55.7	61.7	68.5	76.1	73.6	64.7	55.0	36.7	29.8	50.6
1955													50.9
1956	26.4	30.9	35.1	46.4	57.3	67.3	69.3	69.6	59.9	55.7	41.4	37.1	49.7
1957	22.6	33.4	38.0	50.9	60.1	69.6	71.4	69.5	64.0	50.1	42.6	34.6	50.6
1958	26.3	21.3	35.3	50.9	58.1	63.0	71.8	68.6	62.8	52.7	43.9	22.2	48.1
1959	28.2	31.1	36.3	50.6	63.5	68.2	72.8	75.0	68.2	55.0	39.0	35.5	51.6
1960	30.3	28.5	25.4	53.8	57.6	66.9	69.2	71.4	67.1	53.0	43.9	23.8	49.2
1961	23.2	33.6	40.5	43.4	55.6	66.1	71.5	71.9	70.0	56.9	42.6	30.3	50.5
1962	25.3	28.6	36.1	48.3	65.1	69.2	69.6	70.1	60.3	53.6	40.7	25.9	49.4
1963	21.7	20.7	40.5	49.6	57.9	66.9	70.0	65.3	60.9	59.4	44.5	22.6	48.4
1964	30.8	26.7	39.2	50.7	62.7	68.3	73.2	66.6	62.4	49.4	44.4	33.4	50.7
1965	25.8	29.5	33.5	47.6	63.4	65.6	68.6	69.4	66.3	49.9	43.6	37.4	50.1
1966	23.2	28.5	39.8	45.9	55.3	68.2	73.6	69.8	60.1	50.2	43.0	29.7	48.9
1967	33.1	24.8	38.1	51.7	63.0	70.7	67.9	68.0	58.1	50.2	35.7	32.2	
1968	21.0	22.1	37.9	48.3	53.0	63.8	68.6	67.1	62.1	51.2	40.6	26.4	
1969	24.2	27.1	31.6		56.8	64.7	69.7		60.6	49.8	38.3	24.4	46.9
1970	17.0	23.8	31.6										

Slippery Rock, Pennsylvania