

1.2 Climate

The climate of the Passaic Basin is classified as continental climate due to the prevalence of westerly winds from the continental interior. The region experiences moderately cold winters and hot wet summers. Snow can be expected between November and April. The first frost usually falls in late September/early October and the last frost in early May.

Prevailing wind directions are from the northwest from October to April and from the southwest during the rest of the year. Average winter temperatures are in the high twenties and low thirties on the Fahrenheit scale. Average summer temperatures are in the low seventies. Midsummer weather is characterized by high humidity and frequent thunderstorms. Average annual rainfall is approximately 48 inches to 50 inches throughout most of WMA 6, but is less in some areas and averages 50 inches to 52 inches in some of the higher elevation areas to the west and northwest. Average precipitation for 1961-1990 is shown on Plate 1.2.1.

According to the Office of the New Jersey State Climatologist at Rutgers University, there are 10 monitoring stations located within WMA 6: New Providence, Canoe Brook, Essex Fells, Boonton, Chatham, Chatham Township, Marcella, and Split Rock Pond. Tables 1.2.1 and 1.2.2 present temperature and precipitation data for some of the stations.

TABLE 1.2.1

WMA 6 – Normal Temperature Data (°F)

STATION NAME	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Boonton													
<i>Minimum</i>	18.7	20.4	29.2	39.1	48.8	57.8	62.7	60.9	52.7	40.6	33.5	24.6	40.8
<i>Maximum</i>	36.1	39.2	48.6	60.0	71.1	79.5	84.5	82.7	75.2	63.6	52.3	41.0	61.2
<i>Average</i>	27.4	29.8	38.9	49.6	60.0	68.7	73.6	71.8	64.0	52.1	42.9	32.8	51.0
Canoe Brook													
<i>Minimum</i>	18.2	19.7	28.8	37.9	47.7	57.2	62.2	60.8	52.8	40.4	33	24.1	40.2
<i>Maximum</i>	38.7	41.5	50.6	61.7	72.4	80.9	85.8	84.0	76.7	65.8	54.6	43.6	63.0
<i>Average</i>	28.5	30.6	39.7	49.8	60.1	69.1	74.0	72.4	64.8	53.1	43.8	33.9	51.7
Essex Fells													
<i>Minimum</i>	18.9	20.6	28.6	37.9	47.8	56.7	62.2	60.1	52.4	40.8	33.4	24.3	40.3
<i>Maximum</i>	36.3	39.6	49.2	60.3	71.1	79.1	84.3	82.5	75.0	64.0	52.7	41.2	61.3
<i>Average</i>	27.6	30.1	38.9	49.1	59.5	67.9	73.3	71.3	63.7	52.4	43.1	32.8	50.8

TABLE 1.2.2**WMA 6 – Normal Precipitation Data (inches)**

STATION NAME	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
<i>Boonton</i>	4.17	3.05	4.24	4.37	4.83	4.55	4.67	4.05	5.08	3.96	4.19	3.78	50.94
<i>Canoe Brook</i>	4.13	3.00	4.17	4.22	4.74	4.41	4.73	4.74	5.03	4.18	4.41	3.85	51.61
<i>Essex Fells</i>	4.10	3.05	4.13	4.60	4.93	4.48	4.74	4.39	5.11	4.02	4.23	4.12	51.90
<i>Split Rock Pond</i>	4.47	3.10	4.51	4.71	5.00	4.88	4.58	4.20	5.17	4.09	4.65	4.14	53.50

Data Source: New Jersey State Climatologist at Rutgers University, Data from 1971-2000

The Office of the New Jersey State Climatologist utilizes data from 1971 through 2000 to represent “normal” mean values for monthly and annual temperature and precipitation. Long-term climatic data is available for individual stations and also for the three climatic regions or “Divisions” of the state. The Passaic River Basin in New Jersey is included in Division 1, which includes Bergen, Essex, Hudson, Hunterdon, Morris, Passaic, Somerset, Sussex, Union and Warren counties and covers 37% of New Jersey. Division 3 covers portions of Atlantic, Cape May, Monmouth and Ocean counties within 10 miles of the coast and covers 7% of the state. Division 2 covers the remaining areas, including 56% of the state.

Temperature and precipitation data for Division 1 are presented in the following tables. Table 1.2.3 shows that monthly mean temperatures have been higher than normal for 40 out of 60 months from 1997 through 2001. In 1998, 1999 and 2001, the monthly means for August through December each year (except for October 1999) have been warmer than normal, and in 2001 all but three months were warmer than normal. The month of February was warmer than normal for each year, with monthly mean temperatures at or above freezing.

Warmer temperatures in the spring and fall can extend the growing season, and thus increase the uptake of water by trees and other vegetation. Higher than normal, particularly above freezing, winter temperatures influence the form of precipitation. With warmer winter temperatures, there is less buildup of snow, and thus less recharge to groundwater and less contribution to stream base flow that is normally associated with snowmelt.

Table 1.2.4 presents monthly mean temperatures during the 1960’s drought, and the years immediately preceding and following. During the heart of the 1960’s drought, approximately from September 1962 to September 1966, monthly mean temperatures were above normal during 33% of the months, but rarely for consecutive months, and the annual means were below normal each year. Winter temperatures were generally below normal, with mean temperatures for January and February below freezing. For the entire 1960’s decade, the winter monthly mean temperatures were generally below freezing and the annual averages were below normal for each year. Thus, in the case of the 1960’s drought, warmer than normal temperatures were not a factor.

Precipitation data for Division 1 in New Jersey is presented on Table 1.2.5 for 1997 through 2001 and on Table 1.2.6 for 1959 through 1970. In the five years from 1997 through 2001, monthly precipitation has been below normal during 39 of the 60 months, thus for about 65% of the months. Beginning with September 2000, the monthly precipitation has been lower than normal for 13 out of 16 months, with precipitation lower than normal for all but two months in 2001, and for six consecutive months in the last half of 2001. Each year had a precipitation deficit ranging from 0.8 inches in 1999 to 12.8 inches in 2001, compared to the normal annual precipitation of 49.8 inches.

By way of comparison, in Division 1 the precipitation deficit in the 1960's drought exceeded 15 inches per year in 1963 and 1964 and 19 inches in 1965. The average annual precipitation deficit from 1959 through 1970 was 8.6 inches, and the monthly precipitation was below normal for 70% of the months. In the heart of the drought, there were several strings of five to nine consecutive months with precipitation below normal. These strings were generally interrupted by only one month of normal or above normal precipitation.

The 1960's drought remains the drought of record for the Passaic River Basin. However the droughts experienced in recent years, including the recent drought of 2001-2002, have served as reminders of the importance of protecting water resources for sustaining the ecological system and for water supply. Annual rainfall deficits in the last five years have affected not only surface water, as evidenced by low levels in reservoirs and low base flows in streams for several consecutive months, but also recharge of groundwater, as evidenced by numerous reports of wells going dry or static levels dropping, particularly in the Highlands area of the Passaic River Basin.