

HYDROLOGY

Precipitation and Temperature

The mean precipitation in the basin ranges from 38.4 inches near Jefferson City to 41.6 inches at Versailles in the southwestern portion of the basin (Table 1). May, June, September and October are the months with highest precipitation. January and February are the driest months. July is the hottest month, a temperature near 90°F can be expected. January is the coldest month with the average minimum in the upper teens. Climate statistics for the three National Weather Service sites, Jefferson City water plant, Eldon, and Versailles, in the basin are summarized in Table 1. Additional information can be found on the internet at the Midwestern Regional Climate Center's web site: <http://mcc.sws.uiuc.edu/>.

USGS Gaging Stations

The one active USGS gage station in the basin is on the Moreau River near Jefferson City (station number 6910750) (USGS 2002). This station was active 1947-74, 1975-79, and reactivated in 2000. There are four stations: (North Moreau Creek near California, Hazel Branch tributary near Wardsville, Burris Fork, and South Moreau Creek near Russellville) which have partial records for years between 1957-1979 (Table 2; USGS 1971, USGS 1980). Base low flows recorded for North Moreau Creek on 8-25-70 was 1.4 cfs; Burris Fork on 9-23-71 was 1.88 cfs; and South Moreau Creek on 9-23-71 was 8.29 cfs.

For additional information visit the USGS web site at <http://water.usgs.gov/nwis/>.

Hydrologic Data

The average 25-year discharge of the Moreau River at the 06910500 USGS gaging station near Jefferson City was 381 ft³/sec (USGS 2002). For the period of record, Dec 1947-Sep 1974, the maximum discharge occurred on October 14, 1969 where a discharge of 24,400 ft³/sec was recorded. The lowest discharge, 0.1 ft³/sec, was observed on September 30, 1956. Peaks in average annual monthly discharge occur in March and June and minimums occur in August (Figure hd).

In 1970, Skelton analyzed base-flow data for many streams in Missouri. He estimated flows by regression analysis of base-flow recession characteristics to determine the amount of water that could be expected to flow in a stream during rainless periods of 30 days or less. For the Moreau River, gage 069105, the 7-day low flow for a recurrence interval of 2 years (Q₂) is 6.5 cubic feet per second (cfs) (Skelton 1970). This means the minimum 7-day average flow will be less than 6.5 cfs at intervals averaging 2 years; or, the probability is 50% that the minimum 7 day flow will average less than 6.5 cfs in a given year. Table 3 summarizes low-flow data for gage stations on the Moreau River near Jefferson City and the North Moreau Creek near California.

Dam and Hydropower Influences

There are no hydroelectric generators nor major dams in the basin. However, there is a series of wood pilings crossing the North Moreau Creek (T44N, R16W, S3) about 1.5 miles downstream from the mouth of Straight Fork where a mill once operated. Small impoundments are located on small tributary streams. In 1986, the number of dams 6 feet or higher impounding at least 50-acre feet or 25 foot high and impounding at least 15 acre-feet inventoried by the Department of Natural Resources numbered 73 in Cole, Miller, Moniteau, and Morgan counties (MDNR 1986). This is a relatively low number of lakes compared to other areas of the state.

Table 1. Climatology report of National Weather Service stations in the Moreau basin, 1961-1990 (Midwestern Regional Climate Center, Champaign, IL 2000).

	Average Minimum Temperature °F			Average Mean Temperature °F			Average Maximum Temperature °F			Mean Total Precipitation (inches)		
	Jef	Eld	Ver	Jef	Eld	Ver	Jef	Eld	Ver	Jef	Eld	Ver
Jan	15	18	19	27	29	30	40	40	40	1.38	1.54	1.57
Feb	19	22	23	32	33	34	44	45	45	1.73	1.84	1.89
Mar	30	33	33	43	45	45	56	56	57	3.28	3.44	3.56
Apr	41	44	44	54	56	56	68	68	68	3.55	3.89	3.95
May	51	54	53	63	65	64	76	76	75	4.94	5.01	5.03
Jun	60	62	62	72	73	72	84	84	83	4.41	4.40	4.23
Jul	65	67	67	77	79	78	90	90	88	3.04	3.33	3.50
Aug	62	65	65	75	77	76	88	88	87	3.14	3.42	3.87
Sep	54	57	57	67	69	68	81	80	79	3.97	4.70	4.24
Oct	42	46	45	56	58	57	70	70	69	3.49	3.60	4.03
Nov	31	34	35	44	45	45	56	56	56	2.88	3.13	3.05
Dec	21	23	24	32	33	34	43	43	43	2.62	2.54	2.66
Annual Average	41	44	44	54	55	55	66	66	66	38.4	40.8	41.6

Jef=Jefferson City water plant, MO 1961-1990; Eld=Eldon 1961-1990; Ver=Versailles, MO 1961-1990

Table 2. USGS gage stations located in the Moreau watershed (USGS 1971, USGS 1980, USGS 2002).

Station Name	Station Number	Latitude	Longitude	Elevation above mean sea level	Period of Record	County
Moreau River near Jefferson City ^{wsr}	6910500	38E30'25"	092E15'20"	562.73 ft	1947-74; 1975-79, 2000-01	Cole Cole
	6910750	38? 31'44"	092? 11'31"	546.33 ft		
North Moreau Creek near California ^{pr}	6910420	38E35'13"	092E34'25"		1962-65, 1967, 1970	Moniteau
Burris Fork ^{pr}	6914850	38E32'58"	093E34'15"		1961, 1971	Moniteau
South Moreau Creek near Russellville ^{pr}	6910480	38E29'43"	092E20'40"		1971	Cole
Hazel Branch trib near Wardsville ^{cp}	6910700	38? 28'15"	092? 12'35"		1957-79	Cole
^{wsr} water stage recorder, ^{pr} partial record, low flow, ^{cp} crest stage partial record						

Table 3. Low flow 7-day discharge for various recurrence intervals (Skelton 1970).

			7-day Low flow in cubic feet per second for recurrence interval			
Gage Station	Station Name	Period used in analysis	2 year	5 year	10 year	20 year
6910420	North Moreau Creek near California	1962-65, 1967	0.7	-	0.1	-
6910500	Moreau River near Jefferson City	1948-65	6.5	1.6	0.8	0.4

Figure hd. Mean annual hydrograph for the Moreau River gaging station, 6910500, for the period of record 1947-1974.

