WATER RESOURCES INVESTIGATIONS
OPEN-FILE REPORT 79-9

Low-Flow Characteristics of Streams in the Trempealeau-Black River Basin, Wisconsin

PREPARED BY
UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
IN COOPERATION WITH
WISCONSIN DEPARTMENT OF NATURAL RESOURCES

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B. K. HOLMSTROM

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UNITED STATES DEPARTMENT OF THE INTERIOR

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ABSTRACT

Low-flow characteristics of streams in the Trempealeau-Black River basin are presented. Included are estimates of low-flow frequency and flow duration at 9 gaging stations, and low-flow frequency characteristics at 20 low-flow partial-record stations and 119 miscellaneous sites.

Ten equations are provided to estimate low-flow characteristics at ungaged sites and at sites where one base-flow discharge measurement is available. The low-flow characteristics determined were the annual minimum 7-day mean flow below which the flow will fall on an average of once in 2 years ($Q_{7,2}$) and once in 10 years ($Q_{7,10}$). The equations were determined from multiple-regression analyses that related the low-flow characteristics at gaging stations and low-flow partial-record stations to basin characteristics. Drainage area, soil-infiltration rate, transmissivity, precipitation, snowfall, and base-flow index were the most significant parameters for these analyses.

INTRODUCTION

The purpose of this report is to describe low-flow characteristics of streams in the Trempealeau-Black River basin where streamflow data have been collected and to present equations useful for estimating low-flow characteristics at ungaged sites.

This study was done in cooperation with the Wisconsin Department of Natural Resources. This report is part of a series of 12 planned reports to describe low-flow characteristics of the major basins in Wisconsin (fig. 1).

The report includes: estimates of the magnitude and frequency of recurrence of low flow for various sites where streamflow information has been collected, low-flow discharge measurements that have been obtained at numerous sites throughout the basin, and a method to estimate low-flow characteristics at ungaged sites.

Figure 1. Location of the Trempealeau-Black River basin.

In recent years, a great demand has been placed on water resources in Wisconsin by increased multiple uses such as: maintenance of fish and wildlife habitat, irrigation of crops, dilution and assimilation of wastes, production of hydroelectric power, construction of impoundments for real-estate developments, and maintenance of adequate flow for canoeing. This increased demand requires an accurate determination of water resources during low-flow periods to ensure proper consideration of all users.

Low-flow frequency analyses and flow-duration analyses are presented for all current and discontinued gaging stations in the Trempealeau-Black River basin. These analyses have been completed for 9 gaging stations through water year 1976. Low-flow frequency data are included in the report for 20 low-flow partial-record stations and for 119 miscellaneous sites.

Previous reports by Gebert and Holmstrom (1974, p. 9, 12-14, 41, 76-77), Gebert (1971), and Young and Borman (1973, sheet 2) contain preliminary information on low-flow characteristics of this basin.

For the convenience of readers who may want to use metric units, the data may be converted by using the following factors:

Multiply	By	To obtain
mile (mi)	1.609	kilometer (km)
foot (ft)	.3048	meter (m)
square mile (mi^2)	2.59	square kilometer (km^2)
cubic foot per second (ft^3/s)	.02832	cubic meter per second (m^3/s)
foot per mile (ft/mi)	.1894	meter per kilometer (m/km)
inch (in.)	2.54	centimeter (cm)
cubic foot per second per square mile {$(ft^3/s)/mi^2$}	.01094	cubic meter per second per square kilometer {$(m^3/s)/km^2$}
gallon per day (gal/d)	.003786	cubic meter per day (m^3/d)
gallon per day per square foot {$(gal/d)/ft^2$}	3.517×10^{-4}	cubic meter per day per square meter {$(m^3/d)/m^2$}

BASIN DESCRIPTION

The Trempealeau-Black River basin is in west-central Wisconsin. It includes the drainage area of streams tributary to the Mississippi River between the Chippewa River and the Wisconsin River. The basin has a drainage area of approximately 4,950 mi^2, 8.8 percent of the State.

The 1974 population of the Trempealeau-Black River basin was approximately 200,000. The largest cities are La Crosse, Sparta, and Prairie du Chien, with 1976 populations of 48,845, 6,608, and 5,673, respectively (Wisconsin Legislative Reference Bureau, 1977).

The mean annual precipitation for the basin is 31.6 in., 64 percent which occurs from May through September. Snowfall is 15 to 20 percent of the mean annual precipitation. The mean annual runoff is 8.3 in., and mean annual evapotranspiration is 23.3 in. (Young and Borman, 1973, sheet 1).

The stream valleys in the "Driftless Area" are narrow and V-shaped and contain unconsolidated alluvium. Approximately one-fourth of the basin was glaciated. The glacial drift consists mainly of till that covers the upper part of the Black River basin and unpitted outwash sand and gravel in the Black and Mississippi River valleys (Young and Borman, 1973, sheet 1) (pl. 1).

Most streams have moderate slopes of 4 to 5 ft/mi in the lower reaches with steep gradients of 15 to 30 ft/mi in the headwaters. An exception is the Black River, which has a gradient of 2 ft/mi from Black River Falls to the mouth and 6 ft/mi upstream from Black River Falls (Young and Borman, 1973, sheet 1).

LOW-FLOW CHARACTERISTICS

Low flow generally refers to the low range of stream discharge. A probability of occurrence and a time period can be specified for a more precise definition. Low flow is usually ground-water runoff or base flow, although a 30-, 60-, or 90-day low flow could contain some direct or storm runoff.

A typical low-flow period is illustrated by the discharge hydrograph for Trempealeau River at Dodge gaging station (fig. 2). The annual 90-day low flow occurs from June 5 to September 2. Although this was the lowest flow for 90 consecutive days during the year, periods of direct runoff occurred on at least six occasions. Except for these rises in stream discharge, the remainder of streamflow for the period was predominantly base flow or ground-water runoff.

Low-flow characteristics at 187 sites are given in table 1. Each site is identified by station number and station name. The site location, drainage area, type of site, and other pertinent data are included. Characteristics included for each site depend upon the type of site: gaging station, low-flow partial-record station, or miscellaneous site. The locations of the sites are shown on plate 2.

ANALYTICAL TECHNIQUES

Low-flow characteristics in table 1 were determined by three methods of analysis. These methods depended on the three basic types of data available: (1) continuous record of daily streamflows (continuous-record gaging stations); (2) 7 to 25 base-flow discharge measurements (low-flow partial-record stations); (3) 1 to 11 base-flow discharge measurements (miscellaneous sites).

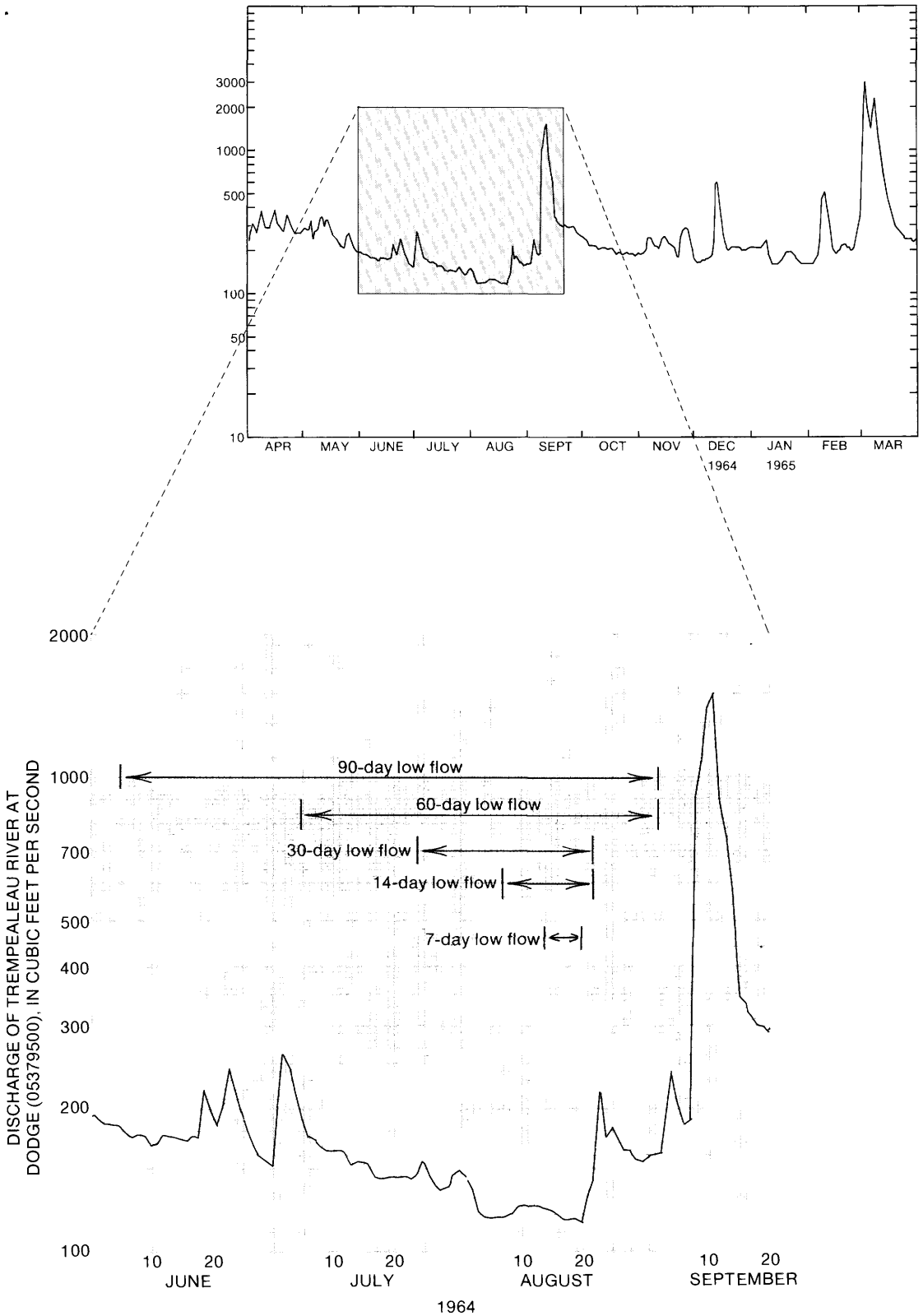

Figure 2. Daily discharge of Trempealeau River at Dodge for 1965 climatic year showing annual low-flow periods for various number of days.

GAGING STATIONS

Low-flow characteristics of a stream where systematic streamflow records have been collected can be determined by flow-duration analysis or frequency analysis. The two analyses serve different purposes. The flow-duration curve indicates the percentage of time that a daily mean flow exceeds a given discharge, and the low-flow frequency curve indicates the probability that a 7-day, 14-day, 30-day, 60-day, or 90-day consecutive mean flow will be exceeded in any given year. The recommended and more generally used analysis for low-flow applications is the low-flow frequency analysis. In this basin the annual minimum 7-day mean flow below which the flow will fall on an average of once in 2 years ($Q_{7,2}$) is approximately equal to 93 percent flow duration. The annual minimum 7-day mean flow below which the flow will fall on an average of once in 10 years ($Q_{7,10}$) is about equal to 99.6 percent flow duration.

Low-flow frequency and flow-duration analyses were completed for all continuous-record gaging stations where data are sufficient: 10 years of record for low-flow frequency analysis and flow-duration analysis. Low-flow frequency values given in table 1 show the magnitude and frequency of

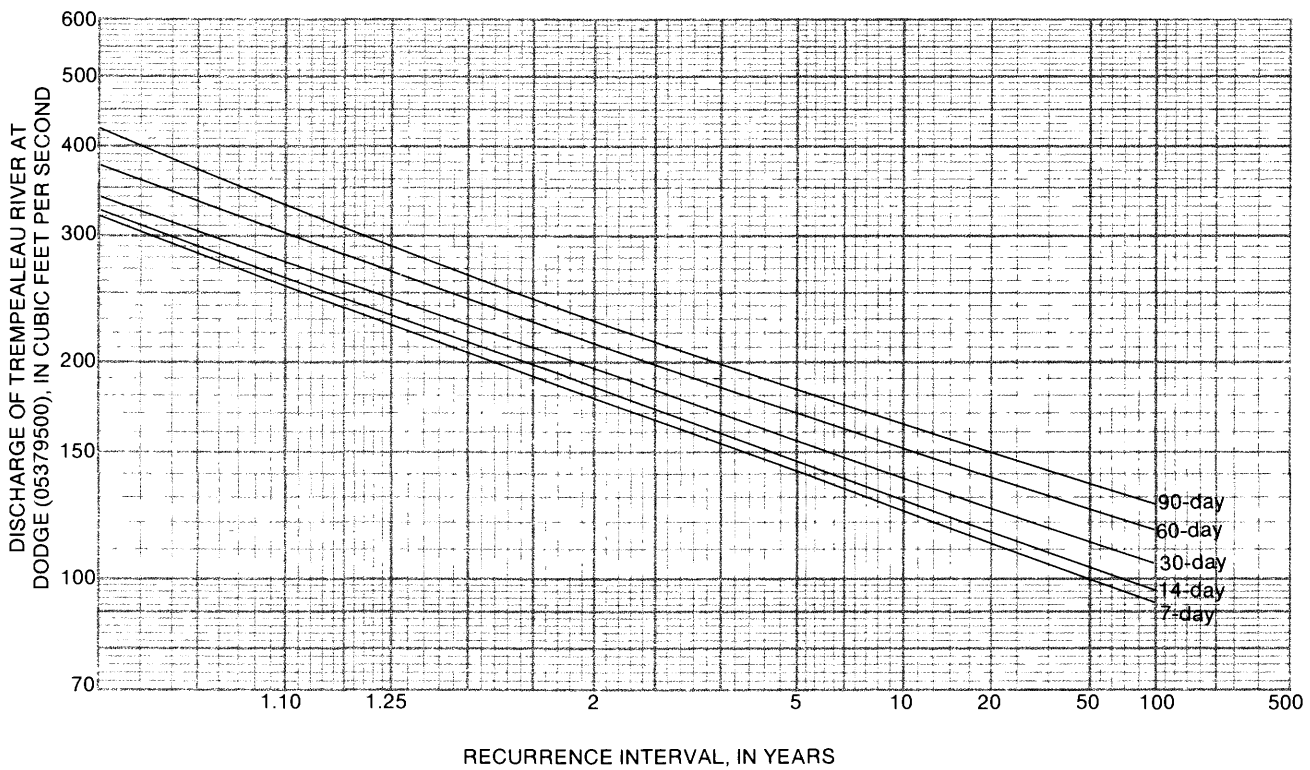

Figure 3. Low-flow frequency curves of the annual minimum mean discharge for the indicated number of consecutive days at Trempealeau River at Dodge.

annual low flows for 7, 14, 30, 60, and 90 consecutive days. Flow-duration values showing the percentage of time that specified discharges were exceeded also are shown in table 1.

The low-flow frequency characteristics were determined from the daily discharge records using a log-Pearson Type III probability distribution or a plotting position analysis (Riggs, 1972, p. 1-8). If results of the two analyses were substantially different, the plotting position analysis was used. Figure 3 is an example of a low-flow frequency curve for the Trempealeau River at Dodge gaging station, and figure 4 is a flow-duration curve for the same site.

For gaging stations that have insufficient data for low-flow frequency analysis or flow duration, the low-flow characteristics were determined by a procedure similar to that outlined in the following section for low-flow partial-record stations.

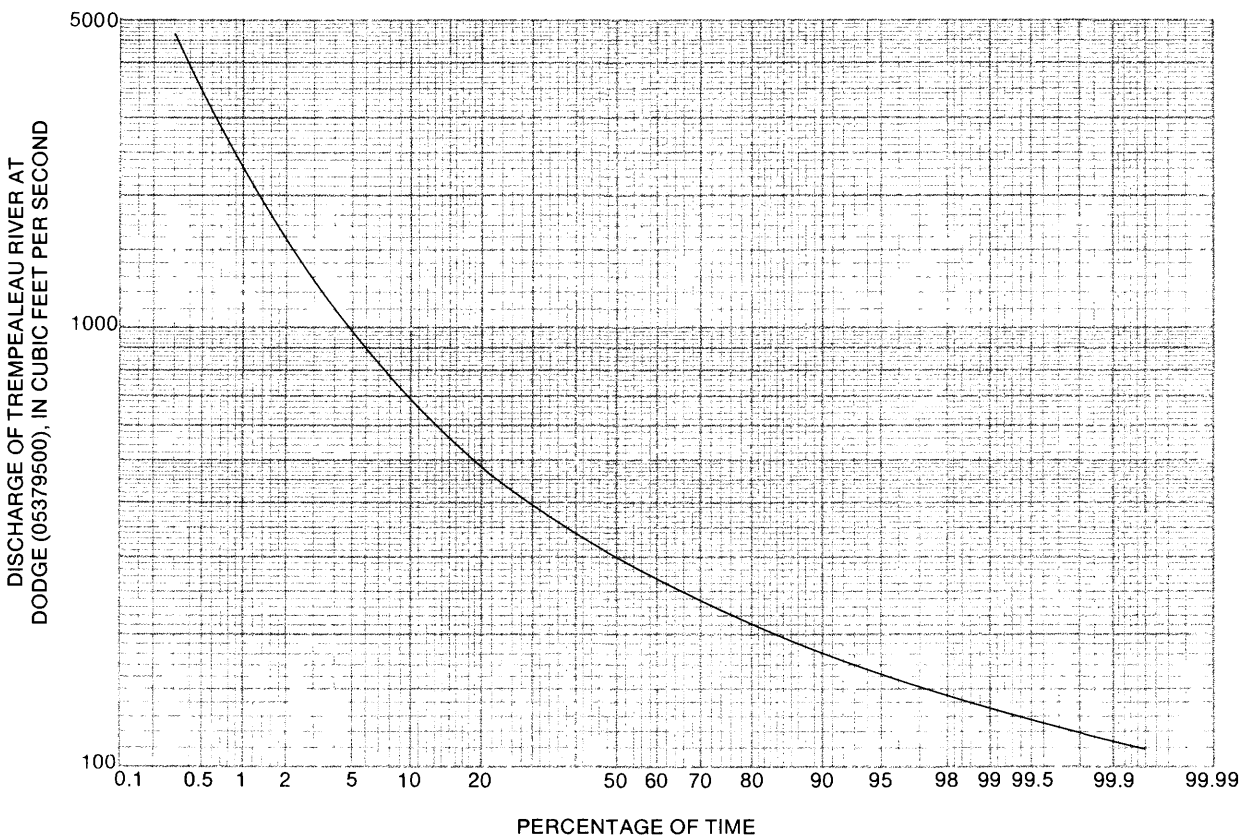

Figure 4. Flow-duration curve showing the percentage of time a given discharge was exceeded for Trempealeau River at Dodge.

LOW–FLOW PARTIAL–RECORD STATIONS

Low-flow characteristics determined for low-flow partial-record stations are the $Q_{7,2}$ and $Q_{7,10}$. Estimates of $Q_{7,2}$ and $Q_{7,10}$ are presented in table 1 for 20 low-flow partial-record stations. Characteristics were determined from a relation line established by correlating 7 to 25 base-flow discharge measurements at low-flow partial-record stations with concurrent discharges at continuous-record gaging stations in the area (Gebert, 1971). The $Q_{7,2}$ and $Q_{7,10}$ at the continuous-record gaging station then were transferred through the relation line to estimate $Q_{7,2}$ and $Q_{7,10}$ for the partial-record station. Figure 5 is an example of this type of analysis for the low-flow partial-record station, Elk Creek at Elk Creek.

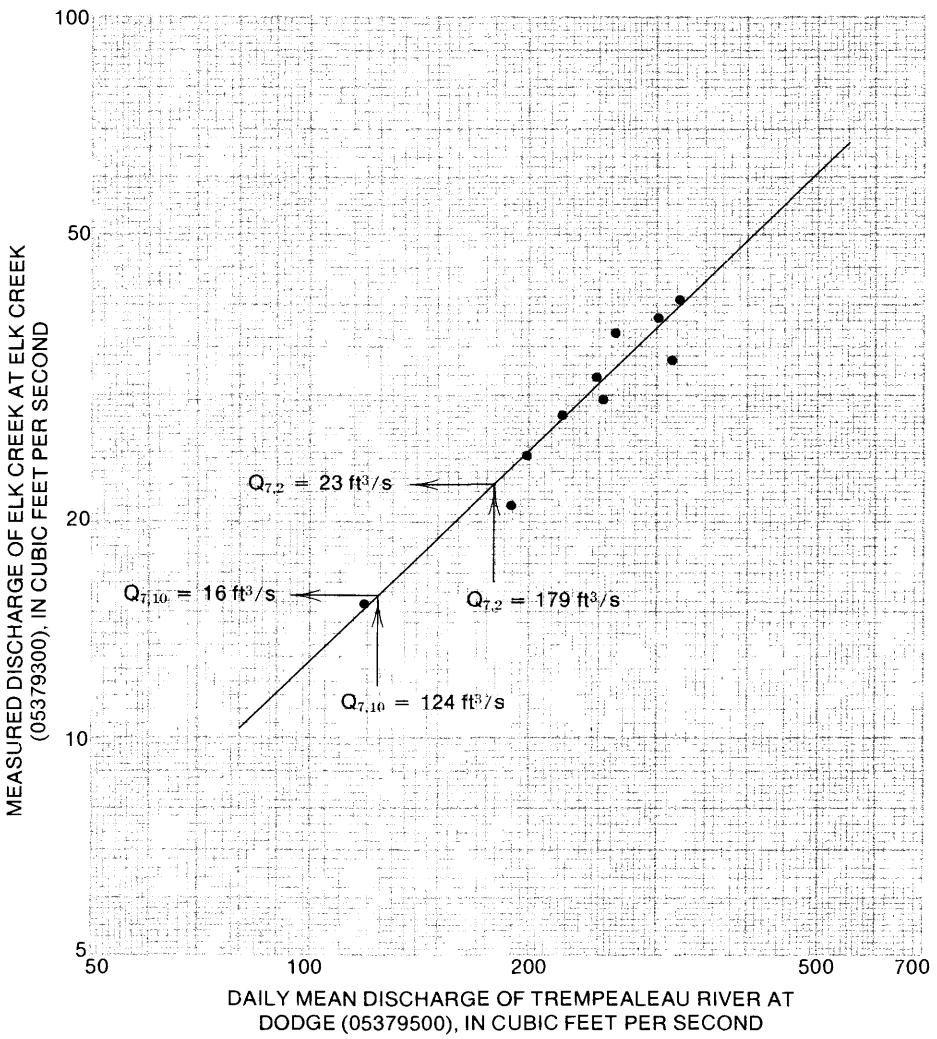

Figure 5. Method of estimating $Q_{7,2}$ and $Q_{7,10}$ at low-flow partial-record stations.

MISCELLANEOUS SITES

Base-flow measurements have been obtained at 158 miscellaneous sites in the Trempealeau-Black River basin as part of other water-resource investigations. Low-flow characteristics were estimated for 46 of these sites (table 1) where at least 3 base-flow discharge measurements were available and a well-defined relationship existed between the measured discharge and the concurrent daily mean discharge at a nearby gaging station. Estimates of $Q_{7,2}$ and $Q_{7,10}$ were made by the same type of analysis that was used for partial-record stations (Gebert and Holmstrom, 1974, p. 3-4). Figure 6 illustrates this type of analysis for the miscellaneous site, Waumandee Creek near Waumandee. The slope of the relation line for miscellaneous

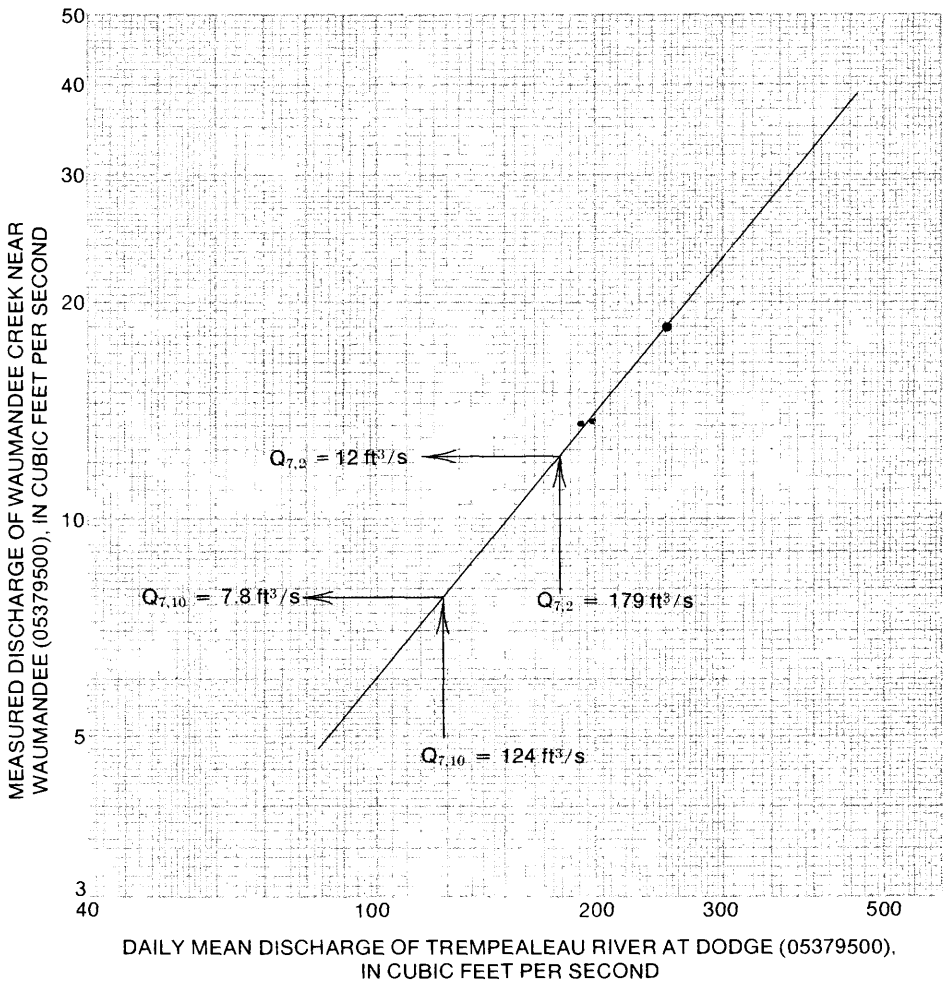

Figure 6. Method of estimating $Q_{7,2}$ and $Q_{7,10}$ at miscellaneous sites.

sites was compared to established relation lines of nearby low-flow partial-record stations and other miscellaneous sites for uniformity. Generally the relation line should have approximately the same slope if the factors that influence low flow are uniform for the area. If the relation line at the site being studied was defined by three discharge measurements that had significant scatter, the line was adjusted to agree more closely with the better established relation line at a low-flow partial-record station.

For 73 miscellaneous sites that had 1 or 2 discharge measurements or correlation analysis was inadequate, the low-flow characteristics were determined by use of regression equations. The regression equations used and discussion of their development is presented later in the report (p. 12-20).

Low-flow characteristics were not estimated at 39 miscellaneous sites because less than 3 discharge measurements were available and the site had a drainage area greater than 150 mi^2 or regression equations provided estimates that were obviously poor when compared to existing data at nearby sites. Base-flow discharge measurements are listed for these sites.

ACCURACY

The low-flow characteristics listed in table 1 are estimates of flow expected in the future. Low-flow characteristics like other streamflow characteristics are only estimates, with their true value being difficult or impossible to determine. The estimates are based on data collected at each site and analyzed by several methods. Each estimate has an error associated with it, dependent on the amount and kind of data, and the analytical method. Two major sources of error are the time-sampling error in streamflow records and the error in the analytical method.

The expected degree of accuracy for the $Q_{7,2}$ and $Q_{7,10}$ estimates are presented in table 1 for selected sites. The accuracy is determined by the standard error of estimate for the 7-day, 2-year low flow ($SE_{7,2}$) and for the 7-day, 10-year low flow ($SE_{7,10}$). The standard error of estimate is a range so that the values estimated by the method are within this range at 67 percent of the sites and within twice this range at about 95 percent of the sites.

The methods used to obtain the standard errors are not precise, and the standard errors presented in table 1 should be used as a relative guide to indicate a general level of confidence. In addition, there may be greater errors associated with accuracy estimates for low-flow estimates that approach 0 ft^3/s.

GAGING STATIONS

Accuracy of low-flow characteristics at gaging stations was determined according to Hardison and Moss (1972, p. 38). An average $SE_{7,2}$ of 5 percent and $SE_{7,10}$ of 8 percent was determined for the seven gaging stations in the Trempealeau-Black River basin that had longer than 10 years of streamflow record.

A common length of record was used to compare the accuracy of low-flow characteristics determined from recorded discharge at gaging stations in the Trempealeau-Black River basin with that of gaging stations throughout the State. This analysis assumed that 10 years of record was available at each gaging station to determine the $Q_{7,10}$ discharge. An $SE_{7,10}$ of 6 percent was determined for the five gaging stations in the "Driftless Area" of the Trempealeau-Black River basin and an $SE_{7,10}$ of 62 percent was determined for the one gaging station in the glaciated area. An $SE_{7,10}$ of 16 percent was determined for gaging stations throughout the State. This indicates that low-flow characteristics can be determined with better-than-average accuracy in the "Driftless Area" and less-than-average accuracy in the glaciated area of the Trempealeau-Black River basin.

LOW-FLOW PARTIAL-RECORD STATIONS

The accuracy of low-flow characteristics at low-flow partial-record stations was determined by a method developed by Hardison and Moss (1972, p. 36-37). Using this method, an average $SE_{7,10}$ of 13 percent was found for 13 low-flow partial-record stations in the "Driftless Area" and an $SE_{7,10}$ of 37 percent for 5 low-flow partial-record stations in the glaciated area of the Trempealeau-Black River basin. The accuracy analysis was not applicable for the two low-flow partial-record stations that had $Q_{7,10}$'s of zero. This compares to an average $SE_{7,10}$ of 29 percent for 265 low-flow partial-record stations throughout the State.

MISCELLANEOUS SITES

The accuracy of low-flow characteristics at miscellaneous sites was determined as an average value for the entire basin by analyzing data collected at low-flow partial-record stations. Three random base-flow measurements were selected from the 7 to 25 measurements available at the 18 low-flow partial-record stations. Low-flow characteristics were determined from these three measurements using the same procedure used for miscellaneous sites. Then low-flow characteristics determined by this method were plotted against the low-flow characteristics based on 7 to 25 measurements. The SE between the two methods was determined from this plotted relationship. The overall SE includes the SE determined by the plotted relationship and the SE associated with the low-flow estimates based on 7 to 25 measurements. Assuming the two errors are independent the overall SE can be approximated by taking the square root of the sum of the squares of the two different SE's. For the Trempealeau-Black River basin this resulted in an $SE_{7,10}$ of 19 percent for the "Driftless Area" (pl. 1) and an $SE_{7,10}$ of 68 percent for the glaciated area (pl. 1), which are listed in table 1 as the basin averages. These values should be used cautiously for any particular site as the actual value for a subbasin could be significantly different from the mean for the basin. If the low-flow characteristics are based on more than three discharge measurements, the accuracy will probably be improved and should approach the accuracy at low-flow partial-record stations as additional measurements are obtained.

ESTIMATING LOW-FLOW CHARACTERISTICS AT UNGAGED SITES

A method is required to transfer low-flow characteristics from gaged sites to ungaged sites because it is impossible to obtain actual streamflow data for all sites where the information is needed. The most practical transfer method relates low-flow characteristics to topographic, climatic, and aquifer characteristics of the drainage basin by multiple-regression analysis. Characteristics used in the multiple-regression analysis and the equations determined are discussed in the following paragraphs. The method is outlined in detail by Thomas and Benson (1970).

STREAMFLOW CHARACTERISTICS

Streamflow characteristics that were studied are the $Q_{7,2}$ and $Q_{7,10}$ that are widely used to describe low flow. The streamflow characteristics are the dependent variable in the multiple-regression analysis.

BASIN CHARACTERISTICS

Differences in streamflow for different locations and times are caused by differences in precipitation patterns and runoff characteristics. Climatic, topographic, and aquifer characteristics are quantified to explain the differences in low flow. These indices are the independent variables in the multiple-regression analysis.

Basin characteristics were selected for the analyses because of their known influence on the rainfall-runoff process. The following list of basin characteristics contains a brief discussion of their effect on low flow and how the indices were determined.

Values for these basin characteristics for low-flow partial-record stations and selected gaging stations in the basin are listed in table 2.

Drainage area (A).--Size of the drainage area is the most significant characteristic in explaining differences in streamflow between sites. Because low flow is ground-water runoff, the contributing area is defined by the ground-water divide of a basin which can be determined from potentiometric maps. Because detailed potentiometric maps are not available for most areas in this basin, the surface-water divide was used to define the contributing drainage area. Owing to the relatively steep relief, the difference between the area of ground-water drainage and surface-water drainage is probably slight.

Drainage areas, in square miles, were computed from U.S. Geological Survey topographic and planimetric maps. Most drainage-area data for this study were obtained from Holmstrom (1972).

Main-channel slope (S).--Main-channel slope (Benson, 1962 and 1964) is a characteristic that relates to the change in streamflow for different basins. The index of slope used in this analysis is the average slope in feet per mile between points 10 percent and 85 percent of the distance upstream from the gaged site to the drainage-basin divide.

Main-channel length (L).--Main-channel length is another landform characteristic that indicates basin shape in conjunction with drainage area of the basin. In estimating ground-water runoff to the stream, L can be viewed as describing the length of the vertical cross-sectional area of the porous aquifer material through which the flow occurs. Channel length was obtained from the U.S. Geological Survey topographic maps by measuring the total indicated blue-line length by a digitizer, divider, or other means.

Basin storage (BS).--Basin storage is that part of total drainage area occupied by lakes and marshes. Variations in streamflow can be caused by retention and release of water from basin storage. For some streams, runoff is delayed by storage, but total runoff may not be reduced; whereas on other streams prolonged retention allows increased evapotranspiration which results in decreased runoff. Essentially, the basin storage index is used in the analysis to reflect the effect of evapotranspiration on low flow.

The basin storage area was obtained from U.S. Geological Survey topographic maps. A value of 1.00 percent was added to all values of basin storage to avoid problems of using zero in the regression analysis.

Forest cover (F).--Forests affect streamflow in several ways. Their major influences on low flow are intercepting precipitation before it reaches the ground and transpiration.

The forest cover index used in this analysis is the percentage of drainage area covered by forests as shown on U.S. Geological Survey topographic maps. A value of 1.00 percent was added to all values of forest cover to avoid problems of using zero in the regression analysis.

Mean annual precipitation (P).--Mean annual precipitation of a basin is the amount of water available for potential runoff. The precipitation that recharges the ground-water aquifer is the source of base flow for a stream. The mean annual precipitation, in inches, for each basin was computed from an isohyetal map determined from precipitation recorded in the 1931-60 period (Wisconsin Statistical Reporting Service, 1967, p. 18) (fig. 7).

A constant of 20 in. was subtracted from each value for use in the regression analysis making constants and coefficients in the regression equation more manageable.

Soil-infiltration rate (I).--Soil permeability influences the amount of direct runoff from a storm and the amount of water that infiltrates the soil. The permeability used is an average rate for the basin under average soil and moisture conditions.

Soil types and average permeability, in inches per hour, for each basin were determined from a map from Young and Borman (1973, sheet 1) (pl. 3).

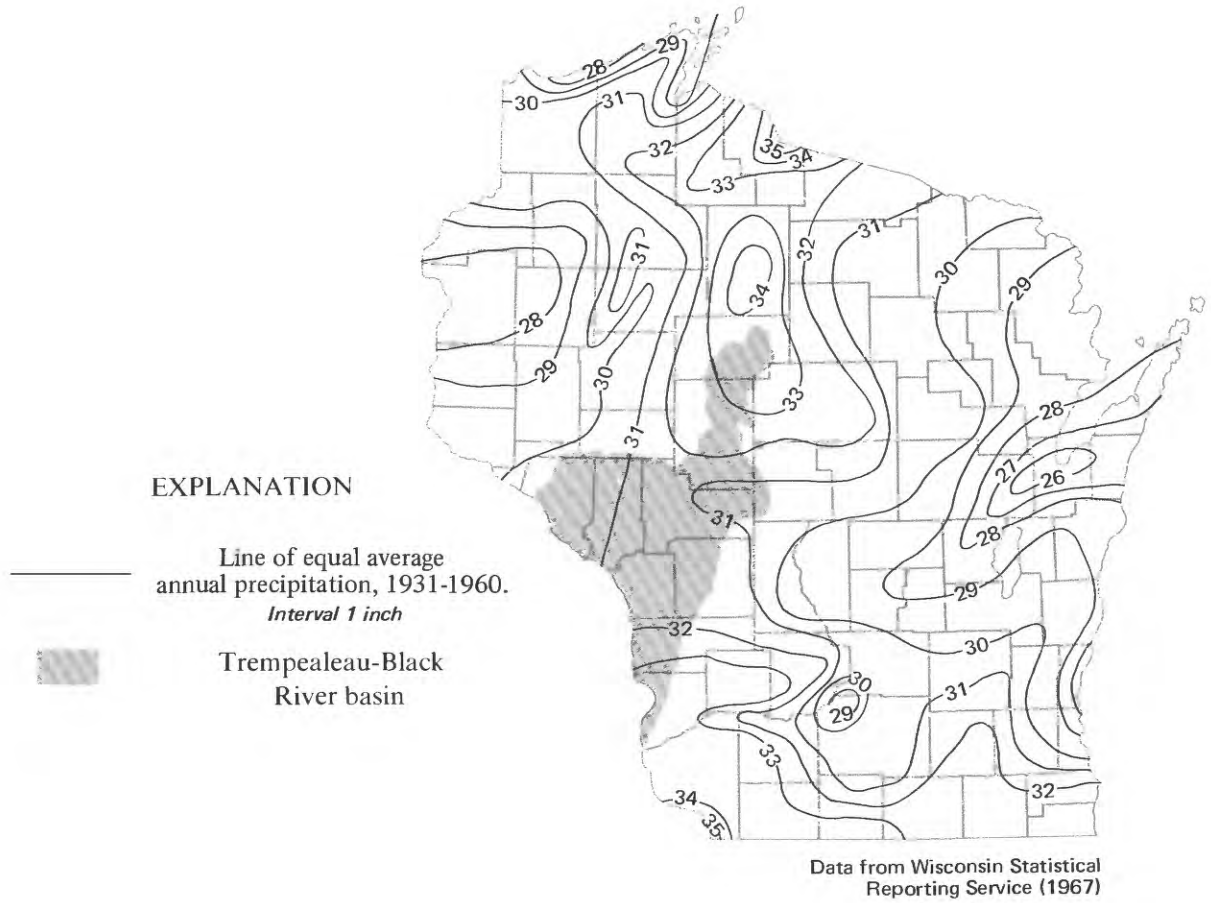

Figure 7. Average annual precipitation.

Mean annual snowfall (Sn).--Mean annual snowfall, like mean annual precipitation, is an indicator of water available for runoff. For each basin an average mean annual snowfall, in inches, was determined from an isohyetal map determined from snowfall recorded during 1930-59 (Wisconsin Statistical Reporting Service, 1970, p. 1) (fig. 8) and average snowfall values from National Weather Service weather stations (Wisconsin Crop Reporting Service, 1961). A constant of 20 in. was subtracted from each value to provide more manageable constants and coefficients in the equations.

Base-flow index (Bf).--A good indicator of a stream's low-flow potential is a discharge measurement made during base-flow conditions. Base-flow measurements provide considerable information about the characteristics of the aquifers supplying outflow to the stream. To use base-flow measurements, it is necessary to convert them to a uniform basis because measurements are generally obtained at various points on the base-flow recession curves.

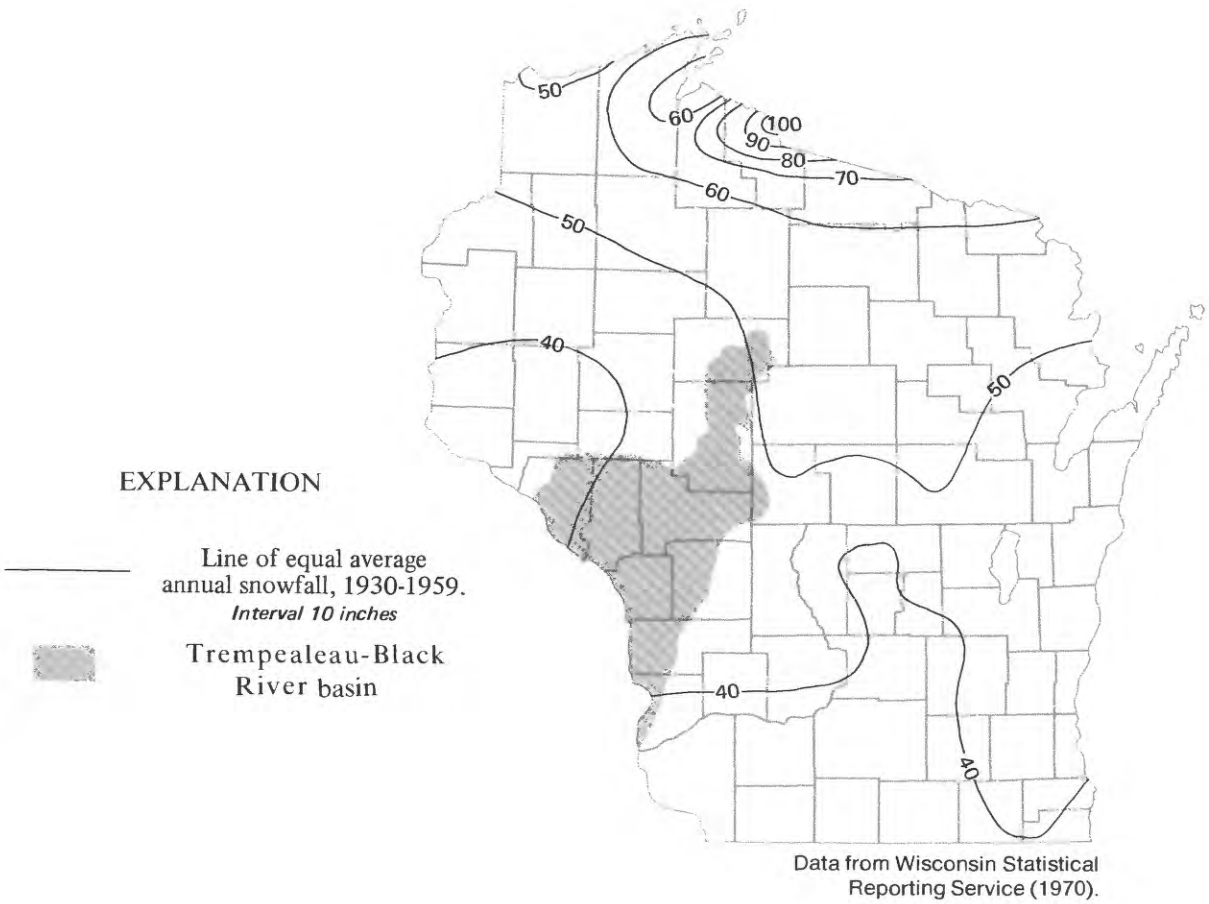

Figure 8. Average annual snowfall.

Discharge at the 90 percent flow duration was selected to represent the base-flow index value. To evaluate the technique and develop the necessary relationships for this study, sites were selected that had discharge measurements obtained for a low-flow investigation during August 10-13, 1970.

Measured discharges (Q_m) at low-flow partial-record stations and miscellaneous sites were converted to a unit discharge by dividing the values by their respective drainage areas (A). These values then were adjusted by a basin ratio to determine the base-flow index for each site. Basin ratios were determined for gaging stations on unregulated streams within the Trempealeau-Black River basin by dividing the discharge at 90 percent flow duration (Q_{90}) by the observed average daily discharge during August 10-13, 1970 (Q_r). Thus, base-flow index values were determined by the equation:

$$Bf = \frac{Q_m \, Q_{90}}{A \, Q_r}$$

Plate 4 shows the locations of 66 sites with base-flow index values, their respective drainage-area outlines, and their computed base-flow index values.

Hydraulic conductivity (K).--Hydraulic conductivity of an aquifer is the volume of water at the existing kinematic viscosity that will move in unit time under a unit hydraulic gradient through a unit area measured at right angles to the direction of flow. Average values of hydraulic conductivity were given to the glacial drift in the Trempealeau-Black River basin and are:

	Hydraulic conductivity {(gal/d)/ft^2}
Lake basins (clay, silt, and sand)	1
Ground moraine (till; consists of clay, silt, sand, gravel, and boulders)	10
End moraine (till; sand and gravel)	100
Outwash (sand and gravel)	2,500

Average values of hydraulic conductivity were obtained for each of the subbasins in the glaciated area by the following procedure: (1) outline subbasin divide on glacial geology map (pl. 1), (2) determine the subareas for each of the glacial drift types, (3) multiply these subareas by the hydraulic conductivity values assigned to the glacial drift, and (4) divide the sum of these products by the sum of the subareas.

Drift thickness (H).--Glacial drift serves as an aquifer that stores water for release to streams. The drift covers only about one-fourth of the basin, a large percentage of which is in the upper part of the Black River subbasin. Its thickness ranges from zero in the "Driftless Area" to 200 ft in the Mississippi River valley. An average drift thickness for each subbasin was determined from the glacial geology and drift thickness map (pl. 1).

Transmissivity (T).--The water-transmitting capability of an aquifer is expressed in terms of transmissivity. Values of transmissivity were obtained by the product of hydraulic conductivity and drift thickness.

REGRESSION ANALYSIS

Multiple-regression analysis was used to determine the relationship between the low-flow characteristics (dependent variables) and the basin characteristics (independent variables). The analysis provides an equation, or series of equations, relating the dependent to the independent variables. This analysis defined mathematical equations of the form:

$$Q_T = a\,A^{b_1}B^{b_2}C^{b_3}\ldots\ldots\ldots\ldots\ldots\ldots N^{b_n},$$

where:

Q_T is a 7-day low-flow characteristic having a T-year recurrence interval, in cubic feet per second;

a is a regression constant defined by the regression analysis;

ABC.....N are drainage-basin characteristics; and

$b_1b_2b_3\ldots\ldots b_n$ are coefficients defined by regression analysis.

The analysis also defined the standard error of estimate (SE) of the dependent variables and the statistical significance of each variable in the equation.

The standard error of estimate is a measure of the accuracy of the regression relationships. It describes a range in error between the defined relationship and the data included in the analysis. Values estimated by the regression equations are within the range of one standard error of estimate at 67 percent of the sites and within twice this range for 95 percent of the sites.

Step-backward regression analyses were performed by digital computer using procedures outlined by Thomas and Benson (1970, p. 26-31). The equations with the lowest standard error of estimate with all variables significant at the 99 percent or the 95 percent confidence level were selected as the best equations for prediction.

Two separate sets of analyses were performed in an attempt to develop equations for sites with no streamflow data available and for sites where some streamflow data are available. These analyses were done for stations in the "Driftless Area" and again for stations in the glaciated area.

SITES WITHOUT STREAMFLOW DATA

Two multiple-regression analyses were run to develop equations in the "Driftless Area" and in the glaciated area (pl. 1) for sites without streamflow data. These analyses included all the basin characteristics given in table 2 except for the base-flow index. Drainage area, soil-infiltration rate, and transmissivity were the only basin characteristics that were significant.

The analysis for the "Driftless Area" was run using data for 3 gaging stations and 13 low-flow partial-record stations in the Trempealeau-Black River basin. Equations 1 and 2 were selected from this analysis. The analysis for the glaciated area was run using data for 3 low-flow partial-record stations ($Q_{7,10}$ >0.01 ft^3/s) in the Trempealeau-Black River basin and 12 low-flow partial-record stations in adjoining basins. Equations 3 and

4 were selected from this analysis. The four equations and their respective standard error of estimates are:

Equation	Applicable to	Standard error	
$Q_{7,2} = 0.291A^{1.02}$	"Driftless Area"	30 percent	(1)
$Q_{7,10} = 0.174A^{1.07}$	"Driftless Area"	37 percent	(2)
$Q_{7,2} = 1.45X10^{-2}A^{1.12}I^{0.480}$	Glaciated area	77 percent	(3)
$Q_{7,10} = 9.18X10^{-5}A^{1.37}T^{0.361}$	Glaciated area	105 percent	(4)

$Q_{7,2}$ is the 7-day, 2-year low flow, in cubic feet per second;

$Q_{7,10}$ is the 7-day, 10-year low flow, in cubic feet per second;

A is the drainage area, in square miles;

I is the soil-infiltration rate, in inches per hour; and

T is the transmissivity, in gallons per day per foot.

Equations 1 through 4 apply to sites without streamflow data and drainage areas less than 150 mi^2.

SITES WITH MINIMUM STREAMFLOW DATA

Two multiple-regression analyses were run to develop equations in the "Driftless Area" and in the glaciated area (pl. 1) for use at sites with one or two discharge measurements. The equations and their respective standard errors of estimate are:

Equation	Applicable to	Standard error	
$Q_{7,2} = 3.09X10^{-3}A^{1.02}P^{2.21}I^{0.158}Bf^{0.693}$	"Driftless Area"	10 percent	(5)
$Q_{7,2} = 0.655A^{1.02}Bf^{0.694}$	"Driftless Area"	16 percent	(6)
$Q_{7,10} = 9.42X10^{-4}A^{1.07}P^{1.51}Sn^{0.790}Bf^{0.836}$	"Driftless Area"	17 percent	(7)
$Q_{7,10} = 0.452A^{1.08}Bf^{0.817}$	"Driftless Area"	22 percent	(8)

Equation	Applicable to	Standard error	
$Q_{7,2} = 0.539A^{1.07}Bf^{0.997}$	Glaciated area	45 percent	(9)
$Q_{7,10} = 0.434A^{1.04}Bf^{1.23}$	Glaciated area	76 percent	(10)

$Q_{7,2}$, $Q_{7,10}$, A, and I are as defined for equations 1 through 4;

P is the mean annual precipitation minus 20, in inches;

Bf is the base-flow index, in cubic feet per second per square mile; and

Sn is the mean annual snowfall minus 20, in inches.

Equations 6 and 8 are provided because they have slightly higher standard errors than equations 5 and 7 and are easier to apply. Equations 6, 8, 9, and 10 were used to compute the low-flow characteristics at miscellaneous sites with one or two discharge measurements and with drainage areas less than 150 mi^2 (table 1).

Equations 5, 7, 9, and 10 should provide estimates of $Q_{7,2}$ and $Q_{7,10}$ at approximately the SE given for the equation for sites where base-flow measurements have been made. In addition, for sites without streamflow data and not on small tributaries, equations 5 through 10 should provide more reliable estimates than equations 1 through 4 for the following conditions:

1. For ungaged sites in an area where the degree of uniformity among Bf values is high, as shown on plate 4.

2. For ungaged sites within the indicated subbasins on plate 4.

VERIFICATION OF REGRESSION EQUATIONS THAT USE BASE-FLOW INDEX

To test the validity of equations 5 and 7, low-flow characteristics were determined by these equations using streamflow data collected at 13 low-flow partial-record stations in the "Driftless Area" during three different periods. Periods selected for the analyses were: a low base-flow period (flow durations greater than 80 percent), August 17-19, 1964; a medium base-flow period (flow durations 60-80 percent), July 6-9, 1970; and a high base-flow period (flow durations less than 60 percent), August 18-20, 1969. Equations 9 and 10 also were tested using streamflow data collected at 15 low-flow partial-record stations in the glaciated area. Periods selected for analyses were: a low base-flow period, July 8-11, 1963; a medium base-flow period, June 23-24, 1966; and a high base-flow period, November 1-3, 1965. Values of Bf were obtained for each period as outlined previously. The $Q_{7,2}$ and $Q_{7,10}$ values computed for these periods using equations 5, 7, 9, and 10 were compared to the $Q_{7,2}$ and $Q_{7,10}$ values listed in table 1, and the following SE's were graphically determined.

Regression analysis equations	SE from regression analysis	SE using various flow conditions to determine Bf		
		Low base flow	Medium base flow	High base flow
Equation 5	10	12	15	12
Equation 7	17	17	21	24
Equation 9	45	28	62	53
Equation 10	76	61	82	72

As illustrated, equations 5, 7, 9, and 10 produce satisfactory results for other sets of flow conditions than were used for their development.

APPLICATION OF ESTIMATING PROCEDURES

SITES WITHOUT STREAMFLOW DATA

Computation of low-flow characteristics at an ungaged site in the "Driftless Area" (pl. 2) may be made as follows:

1. If the conditions listed on page 19 are met, use equations 5 through 8 (page 18) to determine the low-flow characteristics at ungaged sites.

2. Determine base-flow index from plate 4.

3. Compute the other basin characteristics, drainage area, mean annual precipitation, soil-infiltration rate, and mean annual snowfall as outlined on pages 12, 13, and 14.

4. Substitute these values into equations 5 through 8 and solve for the low-flow characteristics.

5. Use equations 1 and 2 (page 18) to determine the low-flow characteristics for sites where the conditions outlined on page 19 cannot be met.

6. Compute the drainage area as indicated on page 12.

7. Substitute these values into equations 1 and 2 and solve for the low-flow characteristics.

For ungaged sites in the "Driftless Area" where the degree of uniformity of base-flow index values is high, Bf can be determined from plate 4, and equations 5 through 8 can be used to determine the low-flow characteristics. For example, to determine the low-flow characteristics of Trempealeau

River, just downstream from the confluence with French Creek near Taylor, the applicable equations are:

$$Q_{7,2} = 3.09X10^{-3}A^{1.02}P^{2.21}I^{0.158}Bf^{0.693} \quad (5)$$

$$Q_{7,10} = 9.42X10^{-4}A^{1.07}P^{1.51}Sn^{0.790}Bf^{0.836} \quad (7)$$

Drainage area was determined as outlined on page 12 and is 139 mi^2.

The average precipitation is approximately 31 in. (fig. 7). A constant of 20 in. has to be subtracted. Therefore, P = 31 in. - 20 in. = 11 in.

The average soil-infiltration rate was determined from plate 3 and is about 2.3 in/hr.

The base-flow index is determined from plate 4 and is a weighted average based on drainage area.

$$Bf = \frac{A_1Bf_1 + A_2Bf_2}{A_1 + A_2}$$

$$Bf = \frac{110(0.31) + (29)(0.28)}{139} = \frac{34.1 + 8.12}{139}$$

$$Bf = 0.30$$

where: A_1 = drainage area at station 05379200 = 110 mi^2,

Bf_1 = base-flow index at station 05379200 = 0.31,

A_2 = intervening drainage area between site of interest and station 05379200 = 29 mi^2, and

Bf_2 = base-flow index for intervening area between site of interest and 05379200 = 0.28.

The mean annual snowfall is approximately 46 in. (fig. 8). A constant of 20 in. has to be subtracted. Therefore, Sn = 46 in. - 20 in. = 26 in.

Substituting these values into their respective equations:

$$Q_{7,2} = 3.09X10^{-3}A^{1.02}P^{2.21}I^{0.158}Bf^{0.693}$$

$$= 3.09X10^{-3}(139)^{1.02}(11)^{2.21}(2.3)^{0.158}(0.30)^{0.693}$$

$$= 3.09X10^{-3}(153)(200)(1.1)(0.43)$$

$$= 45 \text{ ft}^3/\text{s}$$

$$Q_{7,10} = 9.42X10^{-4}A^{1.07}P^{1.51}Sn^{0.790}Bf^{0.836}$$

$$= 9.42X10^{-4}(139)^{1.07}(11)^{1.51}(26)^{0.790}(0.30)^{0.836}$$

$$= 9.42X10^{-4}(196)(37)(13)(0.37)$$

$$= 33 \text{ ft}^3/\text{s}$$

Low-flow characteristics for ungaged sites in which conditions on page 19 are not met can be determined by regression equations 1 and 2. The low-flow characteristics of Fish Creek near Rockland are determined to illustrate the application of equations 1 and 2:

$$Q_{7,2} = 0.291A^{1.02} \quad (1)$$

$$Q_{7,10} = 0.174A^{1.07} \quad (2)$$

The drainage area was determined as outlined on page 12 and is 15.2 mi^2. Substituting this value into the respective equation:

$$Q_{7,2} = 0.291A^{1.02}$$

$$= 0.291(15.2)^{1.02}$$

$$= 0.291(16.1)$$

$$= 4.7 \text{ ft}^3/\text{s}$$

$$Q_{7,10} = 0.174A^{1.07}$$

$$= 0.174(15.2)^{1.07}$$

$$= 0.174(18.4)$$

$$= 3.2 \text{ ft}^3/\text{s}$$

Computation of low-flow characteristics at an ungaged site in the glaciated area (pl. 2) may be made as follows:

1. If the conditions listed on page 19 are met, use equations 9 and 10 (page 19) to determine the low-flow characteristics at ungaged site.

2. Determine drainage area as outlined on page 12.

3. Determine base-flow index from plate 4.

4. Substitute these values into equations 9 and 10 and solve for the low-flow characteristics.

5. Use equations 3 and 4 listed on page 18 to determine the low-flow characteristics for sites where the conditions outlined on page 19 cannot be met.

6. Determine the drainage area as outlined on page 12, soil-infiltration rate as indicated on page 13, and transmissivity as indicated on page 16.

7. Substitute these values into equations 3 and 4 and solve for the low-flow characteristics.

For ungaged sites within the indicated subbasins on plate 4, the Bf value can be obtained from plate 4, and equations 9 and 10 can be used to determine the low-flow characteristics. For example, to determine the low-flow characteristics of South Fork Poplar River, directly upstream from the confluence with East Fork Poplar River near Riplinger, the applicable equations are:

$$Q_{7,2} = 0.539A^{1.07}Bf^{0.997} \quad (9)$$

$$Q_{7,10} = 0.434A^{1.04}Bf^{1.23} \quad (10)$$

Drainage area was determined as outlined on page 12 and is 25.6 mi^2.

Base-flow index is determined from plate 4 and is 0.016.

Substituting these values into the respective equations:

$$Q_{7,2} = 0.539A^{1.07}Bf^{0.997}$$

$$= 0.539(25.6)^{1.07}(0.016)^{0.997}$$

$$= 0.539(32.1)(0.016)$$

$$= 0.28 \text{ ft}^3/\text{s}$$

$$Q_{7,10} = 0.434A^{1.04}Bf^{1.23}$$

$$= 0.434(25.6)^{1.04}(0.016)^{1.23}$$

$$= 0.434(29.1)(0.0062)$$

$$= 0.08 \text{ ft}^3/\text{s}$$

Low-flow characteristics for ungaged sites in which conditions on page 19 are not met can be determined by regression equations 3 and 4. The low-flow characteristics of Joe Creek near Perkinstown at the mouth are determined to illustrate the application of equations 3 and 4:

$$Q_{7,2} = 1.45X10^{-2}A^{1.12}I^{0.480} \quad (3)$$

$$Q_{7,10} = 9.18X10^{-5}A^{1.37}T^{0.361} \quad (4)$$

The drainage area was determined as outlined on page 12 and is 8.84 mi^2.

The soil-infiltration rate (pl. 3) has a range from 0.8 to 2.5 in/hr under a 0.5 in. head. Using an average value, I is 1.65 in/hr.

The hydraulic conductivity and drift thickness are determined from the glacial geology and drift thickness map (pl. 1). Approximately 0.3 mi^2 of the basin contains pitted outwash {K = 2,500 $(gal/d)/ft^2$} and 8.54 mi^2 contains end moraine {K = 100 $(gal/d)/ft^2$}. The average value of hydraulic conductivity (K) is $\frac{0.3 \text{ X } 2,500 + 8.54 \text{ X } 100}{8.84}$ = 180 $(gal/d)/ft^2$. The drift thickness (H) is about 100 ft. Hence transmissivity (T) = (K)(H) = 180 X 100 = 18,000 (gal/d)/ft. Substituting these values into their respective equations:

$$Q_{7,2} = 1.45X10^{-2}A^{1.12}I^{0.480}$$

$$= 1.45X10^{-2}(8.84)^{1.12}(1.65)^{0.480}$$

$$= 1.45X10^{-2}(11.5)(1.27)$$

$$= 0.21 \text{ ft}^3/\text{s}$$

$$Q_{7,10} = 9.18X10^{-5}A^{1.37}T^{0.361}$$

$$= 9.18X10^{-5}(8.84)^{1.37}(18,000)^{0.361}$$

$$= 9.18X10^{-5}(19.8)(34.4)$$

$$= 0.06 \text{ ft}^3/\text{s}$$

SITES WITH MINIMUM STREAMFLOW DATA

Computation of the low-flow characteristics at sites in the "Driftless Area" with minimum streamflow data available is made as follows:

1. Use equations 5 and 7 listed on page 18 to determine the low-flow characteristics.

2. Determine from plate 2 and table 1 the type of streamflow data that are available.

3. If the streamflow measurements are made during base-flow conditions, the Bf should be determined as outlined on pages 14, 15, and 16.

4. Compute the other basin characteristics, drainage area, mean annual precipitation, soil-infiltration rate, and mean annual snowfall, used in the equation as outlined on pages 12, 13, and 14.

5. Substitute values determined in steps 3 and 4 into equations 5 and 7.

The following procedure would be used to determine the low-flow characteristics of Fly Creek near Whitehall (station number 05379275).

The applicable equations for a station in the "Driftless Area" with minimum streamflow data available are:

$$Q_{7,2} = 3.09X10^{-3}A^{1.02}P^{2.21}I^{0.158}Bf^{0.693}$$

$$Q_{7,10} = 9.42X10^{-4}A^{1.07}P^{1.51}Sn^{0.790}Bf^{0.836}$$

Drainage area (A) obtained from table 1, page 12, is 10.2 mi^2.

The mean annual precipitation is approximately 31.2 in. (fig. 7). A constant of 20 in. has to be subtracted. Therefore, P = 31.2 - 20 = 11.2 in.

An average soil-infiltration rate for the basin (pl. 3) has a range of 0.8 to 2.5 in/hr under a 0.5 in. head. Using an average value, I is 1.65 in/hr.

The mean annual snowfall for the basin is approximately 46 in. A constant of 20 in. has to be subtracted. Therefore, Sn = 46 - 20 = 26 in.

The base-flow index cannot be obtained from plate 4 because a base-flow measurement was not obtained during the August 10-13, 1970, period. Therefore, a Bf value has to be determined from the base-flow measurement that is available. Following the same general procedure indicated on pages 14, 15, and 16, a Bf value was determined by the equation:

$$Bf = \frac{Q_m \, Q_{90}}{A \, Q_r}$$

where: Q_m is the measured discharge, 2.60 ft^3/s, of Fly Creek near Whitehall on August 19, 1970;

A is the drainage area, 10.2 mi^2, of Fly Creek near Whitehall;

Q_r is the recorded discharge at a nearby continuous-record gaging station. Referring to plate 1, station 05379500, Trempealeau River at Dodge is the closest active gaging station. From "Water Resources Data for Wisconsin" (1972) the

average daily discharge for August 19, 1970, was 230 ft^3/s; and

Q_{90} for Trempealeau River at Dodge is 183 ft^3/s, obtained from table 1.

Substituting these values in the equation:

$$Bf = \frac{Q_m \, Q_{90}}{A \, Q_r}$$

$$= \frac{(2.60)(183)}{(10.2)(230)}$$

$$= 0.203 \ (ft^3/s)/mi^2$$

The low-flow characteristics then can be determined by substituting these values in their respective equations.

$$Q_{7,2} = 3.09X10^{-3} A^{1.02} P^{2.21} I^{0.158} Bf^{0.693}$$

$$= (3.09X10^{-3})(10.2)^{1.02}(11.2)^{2.21}(1.65)^{0.158}(0.203)^{0.693}$$

$$= (3.09X10^{-3})(10.7)(208)(1.08)(0.331)$$

$$= 2.5 \ ft^3/s$$

$$Q_{7,10} = 9.42X10^{-4} A^{1.07} P^{1.51} Sn^{0.790} Bf^{0.836}$$

$$= (9.42X10^{-4})(10.2)^{1.07}(11.2)^{1.51}(26)^{0.790}(0.203)^{0.836}$$

$$= (9.42X10^{-4})(12.0)(38.4)(13)(0.264)$$

$$= 1.5 \ ft^3/s$$

COMPARISON OF METHODS

If estimates of low-flow characteristics are required at sites other than those presented in this report, the user interested in the data should evaluate the need for the low-flow information and then select a method based on the following criteria. Generally the most important criteria in choosing a method are: accuracy requirements of the low-flow characteristics; time available to collect and analyze data; and cost of data collection and analyses.

Tables 3 and 4 compare the methods available and provide: type of data required; number of sites where required data are available; time

required to collect data; analytical method used to determine the low-flow characteristics; and standard error of estimate associated with the method. If a high degree of reliability is required of low-flow characteristics and sufficient time is available for data collection, a gaging station or low-flow partial-record station can be operated. If a lesser degree of reliability is acceptable at a site or time and money are limited, three base-flow discharge measurements can be obtained, or one of the regression equations may be sufficient.

SUMMARY

Low-flow characteristics were determined for 9 gaging stations, 20 low-flow partial-record stations, and 119 miscellaneous sites in the Trempealeau-Black River basin.

The method used in estimating the low-flow characteristics was dependent on the amount of discharge data available at the site. The low-flow characteristics at a gaging station with 10 or more years of record were determined by a log-Pearson Type III frequency analysis or plotting-position analysis. At a low-flow partial-record station (7 or more discharge measurements) or miscellaneous site (3 or more discharge measurements) a graphical correlation was used to determine the $Q_{7,2}$ and $Q_{7,10}$. At miscellaneous sites (1 or 2 discharge measurements) and ungaged sites (no discharge measurements) multiple-regression equations were developed to determine the low-flow characteristics.

The standard error of estimate of the 7-day, 10-year low flow ($SE_{7,10}$) was provided. The average $SE_{7,10}$ in the "Driftless Area" of the basin ranged from 6 to 37 percent, depending on the type of data available. For the glaciated area of the basin the average $SE_{7,10}$ ranged from 23 to 105 percent. The methods used to determine the standard errors are not precise and should be used as a relative guide to indicate a general level of confidence.

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Table 1.--Low-flow characteristics for sites in the Trempealeau-Black River basin

05371798 North Fork Buffalo River near Osseo, Wis.

Location.--SW¼SE¼ sec. 3, T. 24 N., R. 6 W., Jackson County, at bridge on Moe Road, 6.4 mi east of Osseo.

Drainage area.--9.2 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 12, 1970, 3.04 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 2.3 ft^3/s, $Q_{7,10}$ = 1.5 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05371830 Buffalo River at Osseo, Wis.

Location.--SW¼NW¼ sec. 9, T. 24 N., R. 7 W., Trempealeau County, at bridge on County Trunk O, 1.3 mi west of Osseo.

Drainage area.--73.7 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 9, 1972, 50.3 ft^3/s; June 25, 1973, 68.8 ft^3/s; Sept. 12, 1973, 40.0 ft^3/s; Aug. 21, 1976, 19.7 ft^3/s; Sept. 15, 1977, 17.1 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 16 ft^3/s, $Q_{7,10}$ = 11 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 5 discharge measurements.

Accuracy.--$SE_{7,10}$ = 19 percent (basin average).

05371850 Buffalo River at Strum, Wis.

Location.--SW¼SE¼ sec. 18, T. 24 N., R. 8 W., Trempealeau County, at foot bridge in city park at Strum.

Drainage area.--124 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 9, 1972, 77.9 ft^3/s; June 26, 1973, 139 ft^3/s; Sept. 12, 1973, 80.5 ft^3/s; Aug. 21, 1976, 38.0 ft^3/s; Sept. 15, 1977, 35.1 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 32 ft^3/s, $Q_{7,10}$ = 20 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 5 discharge measurements.

Accuracy.--$SE_{7,10}$ = 19 percent (basin average).

05371860 Buffalo River at Eleva, Wis.

Location.--NE¼SE¼ sec. 9, T. 24 N., R. 9 W., Trempealeau County, at bridge on State Highway 93, at Eleva.

Drainage area.--165 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 9, 1972, 96.4 ft^3/s; June 26, 1973, 204 ft^3/s; Sept. 12, 1973, 112 ft^3/s; Aug. 21, 1976, 54.7 ft3/s; Sept. 15, 1977, 44.8 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 38 ft^3/s, $Q_{7,10}$ = 23 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 5 discharge measurements.

Accuracy.--$SE_{7,10}$ = 19 percent (basin average).

Table 1.--Low-flow characteristics for sites in the Trempealeau-Black River basin--Continued

05371880 Buffalo River near Mondovi, Wis.

Location.--NW¼NE¼ sec. 17, T. 24 N., R. 10 W., Buffalo County, at country road, 2.7 mi east of Mondovi.

Drainage area.--203 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 11, 1970, 90.5 ft^3/s.

05371895 Buffalo River at Mondovi, Wis.

Location.--NW¼SE¼ sec. 14, T. 24 N., R. 11 W., Buffalo County, at sewage-treatment plant, 0.5 mi downstream from County Trunk H bridge, at Mondovi.

Drainage area.--238 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 9, 1972, 138 ft^3/s; June 26, 1973, 278 ft^3/s; Sept. 12, 1973, 164 ft^3/s; Aug. 21, 1976, 85.7 ft^3/s; Sept. 15, 1977, 85.7 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 64 ft^3/s, $Q_{7,10}$ = 41 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 5 discharge measurements.

Accuracy.--$SE_{7,10}$ = 19 percent (basin average).

05371910 Harvey Creek at Mondovi, Wis.

Location.--SE¼SE¼ sec. 10, T. 24 N., R. 11 W., Buffalo County, at bridge on County Trunk A, 1.0 mi west of Mondovi.

Drainage area.--37.8 mi^2. Tributary to.--Buffalo River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 11, 1970, 9.07 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 7.6 ft^3/s, $Q_{7,10}$ = 5.3 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05371960 Tamarack Creek at Modena, Wis.

Location.--SE¼SE¼ sec. 23, T. 23 N., R. 12 W., Buffalo Creek, on County Trunk J, 0.2 mi south of Modena.

Drainage area.--15.7 mi^2. Tributary to.--Buffalo River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 12, 1970, 4.10 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 3.3 ft^3/s, $Q_{7,10}$ = 2.2 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

Table 1.--Low-flow characteristics for sites in the Trempealeau-Black River basin--Continued

05372000 Buffalo River near Tell, Wis.

Location.--NW¼NW¼ sec. 16, T. 22 N., R. 12 W., at bridge on County Trunk F, 1.1 mi northeast of Tell.

Drainage area.--406 mi^2. Tributary to.--Mississippi River.

Type of site.--Gaging station.

Period of record.--October 1932 to September 1951, monthly discharge only for some periods.

Average discharge.--254 ft^3/s, 19 years.

Extremes.--Maximum discharge, 8,650 ft^3/s Apr. 4, 1934; minimum observed, 59 ft^3/s Aug. 16, 1933.

Period of consecutive days	Magnitude and frequency of annual low flow. Discharge, in cubic feet per second, for indicated recurrence interval, in years				
	2	5	10	20	50
7	111	88	78	71	64
14	114	90	80	73	66
30	123	100	90	83	76
60	135	111	101	93	86
90	149	122	110	101	92

Duration table of daily flow. Discharge, in cubic feet per second, which was exceeded for indicated percent of time							
Percent	2	5	10	20	30	40	50
ft^3/s	950	580	415	308	255	222	199
Percent	60	70	80	90	95	98	99.9
ft^3/s	177	159	139	120	109	98	78

Accuracy.--$SE_{7,2}$ = 7 percent, $SE_{7,10}$ = 9 percent.

05377700 Cochrane Ditch at Cochrane, Wis.

Location.--SE¼SE¼ sec. 8, T. 20 N., R. 12 W., Buffalo County, at country road bridge, 0.5 mi south of Cochrane.

Drainage area.--8.87 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 9, 1972, 9.59 ft^3/s; June 26, 1973, 8.72 ft^3/s; Sept. 12, 1973, 7.58 ft^3/s; Aug. 9, 1977, 4.07 ft^3/s; Sept. 14, 1977, 5.45 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 4.4 ft^3/s, $Q_{7,10}$ = 3.5 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 5 discharge measurements.

Accuracy.--$SE_{7,10}$ = 19 percent (basin average).

05378050 Waumandee Creek near Waumandee, Wis.

Location.--SW¼NW¼ sec. 2, T. 21 N., R. 11 W., Buffalo County, at bridge on private road, 1.6 mi northeast of Waumandee.

Drainage area.-- Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 20, 1976, 18.5 ft^3/s; Aug. 9, 1977, 13.8 ft^3/s; Sept. 14, 1977, 13.6 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 12 ft^3/s, $Q_{7,10}$ = 7.8 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 3 discharge measurements.

Accuracy.--$SE_{7,10}$ = 19 percent (basin average).

05378060 Waumandee Creek at Waumandee, Wis.

Location.--SE¼NW¼ sec. 15, T. 21 N., R. 11 W., Buffalo County, at bridge on County Trunk E, 0.2 mi south of Waumandee.

Drainage area.--56.0 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 11, 1970, 31.8 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 22 ft^3/s, $Q_{7,10}$ = 17 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05378100 Little Waumandee Creek near Cream, Wis.

Location.--SE¼SE¼ sec. 19, T. 21 N., R. 11 W., Buffalo County, at bridge on State Highway 88, 2.8 mi south of Cream.

Drainage area.--46.0 mi^2. Tributary to.--Waumandee Creek.

Type of site.--Low-flow partial-record station.

Minimum discharge measured.--6.55 ft^3/s, Aug. 19, 1964.

Low-flow frequency.--$Q_{7,2}$ = 12 ft^3/s, $Q_{7,10}$ = 7.0 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 8 discharge measurements made during the period 1964-70.

Accuracy.--$SE_{7,2}$ = 9 percent, $SE_{7,10}$ = 15 percent.

05378200 Eagle Creek near Fountain City, Wis.

Location.--NW¼SW¼ sec. 33, T. 20 N., R. 11 W., Buffalo County, at bridge on County Trunk G, 2.3 mi north of Fountain City.

Drainage area.--26.8 mi^2. Tributary to.--Waumandee Creek.

Type of site.--Low-flow partial-record station.

Minimum discharge measured.--4.02 ft^3/s, Aug. 19, 1964.

Low-flow frequency.--$Q_{7,2}$ = 5.5 ft^3/s, $Q_{7,10}$ = 4.1 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 21 discharge measurements made during the period 1961-70.

Accuracy.--$SE_{7,2}$ = 6 percent, $SE_{7,10}$ = 8 percent.

05379180 Trempealeau River at Hixton, Wis.

Location.--NW¼SE¼ sec. 17, T. 22 N., R. 5 W., Jackson County, at State Highway 95 bridge, at Hixton.

Drainage area.--58.3 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 10, 1972, 26.8 ft^3/s; June 26, 1973, 54.2 ft^3/s; Sept. 12, 1973, 39.5 ft^3/s; Aug. 21, 1976, 23.3 ft^3/s; Sept. 15, 1977, 22.9 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 19 ft^3/s, $Q_{7,10}$ = 14 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 5 discharge measurements.

Accuracy.--$SE_{7,10}$ = 19 percent (basin average).

Table 1.--Low-flow characteristics for sites in the Trempealeau-Black River basin--Continued

05379200 Trempealeau River at Taylor, Wis.

Location.--NE¼SE¼ sec. 5, T. 21 N., R. 6 W., Jackson County, at County Trunk P, 0.4 mi north of Taylor.

Drainage area.--110 mi^2. Tributary to.--Mississippi River.

Type of site.--Low-flow partial-record station.

Minimum discharge measured.--23.7 ft^3/s, Aug. 18, 1964.

Low-flow frequency.--$Q_{7,2}$ = 35 ft^3/s, $Q_{7,10}$ = 25 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 13 discharge measurements made during the period 1964-77.

Accuracy.--$SE_{7,2}$ = 6 percent, $SE_{7,10}$ = 8 percent.

05379210 Trempealeau River at Blair, Wis.

Location.--NW¼SE¼ sec. 16, T. 21 N., R. 7 W., Trempealeau County, at sewage-treatment plant, at Blair.

Drainage area.--176 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 10, 1972, 84.1 ft^3/s; Sept. 12, 1973, 108 ft^3/s; Jan. 9, 1974, 85.0 ft^3/s; Aug. 20, 1976, 62.9 ft^3/s; Sept. 14, 1977, 51.8 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 47 ft^3/s, $Q_{7,10}$ = 34 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 5 discharge measurements.

Accuracy.--$SE_{7,10}$ = 19 percent (basin average).

05379212 Tappen Coulee at Blair, Wis.

Location.--SE¼SE¼ sec. 16, T. 21 N., R. 7 W., Trempealeau County, at bridge on town road, at Blair.

Drainage area.--4.44 mi^2. Tributary to.--Trempealeau River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 19, 1976, 0.80 ft^3/s; Aug. 8, 1977, 0.55 ft^3/s; Sept. 14, 1977, 0.61 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.49 ft^3/s, $Q_{7,10}$ = 0.30 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 3 discharge measurements.

Accuracy.--$SE_{7,10}$ = 19 percent (basin average).

05379220 Lyons Creek near Northfield, Wis.

Location.--SE¼SE¼ sec. 14, T. 23 N., R. 6 W., Jackson County, at bridge on country road, 1.6 mi northeast of Northfield.

Drainage area.--2.33 mi^2. Tributary to.--Pigeon Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 17, 1970, 0.39 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.36 ft^3/s, $Q_{7,10}$ = 0.20 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05379222 Pigeon Creek near Northfield, Wis.

Location.--SW¼SE¼ sec. 14, T. 23 N., R. 6 W., Jackson County, at bridge on country road, 1.4 mi northeast of Northfield.

Drainage area.--10.3 mi^2. Tributary to.--Trempealeau River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 17, 1970, 7.12 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 4.4 ft^3/s, $Q_{7,10}$ = 3.2 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05379224 Ellingson Coulee near Northfield, Wis.

Location.--SE¼SW¼ sec. 14, T. 23 N., R. 6 W., Jackson County, at mouth, 1.4 mi northeast of Northfield.

Drainage area.--2.56 mi^2. Tributary to.--Pigeon Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 17, 1970, 0.66 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.54 ft^3/s, $Q_{7,10}$ = 0.32 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05379226 Pigeon Creek at Northfield, Wis.

Location.--SW¼NW¼ sec. 22, T. 23 N., R. 6 W., Jackson County, at bridge on State Highway 27, at Northfield.

Drainage area.--17.0 mi^2. Tributary to.--Trempealeau River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 18, 1970, 9.96 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 6.7 ft^3/s, $Q_{7,10}$ = 5.0 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05379228 Sands Creek near York, Wis.

Location.--NW¼NW¼ sec. 28, T. 23 N., R. 6 W., Jackson County, at bridge on State Highway 121, 1.1 mi east of York.

Drainage area.--2.94 mi^2. Tributary to.--Pigeon Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 18, 1970, 0.68 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.59 ft^3/s, $Q_{7,10}$ = 0.35 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

Table 1.--Low-flow characteristics for sites in the Trempealeau-Black River basin--Continued

05379230 Beaver Creek near Northfield, Wis.

Location.--NE¼SW¼ sec. 9, T. 23 N., R. 6 W., Jackson County, at bridge on country road, 1.9 mi northwest of Northfield.

Drainage area.--2.89 mi^2. Tributary to.--Pigeon Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 18, 1970, 1.23 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.89 ft^3/s, $Q_{7,10}$ = 0.57 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05379232 Beaver Creek at York, Wis.

Location.--SW¼SW¼ sec. 20, T. 23 N., R. 6 W., Jackson County, 0.1 mi upstream from mouth, 0.2 mi northeast of York.

Drainage area.--6.63 mi^2. Tributary to.--Pigeon Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 18, 1970, 2.92 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 2.1 ft^3/s, $Q_{7,10}$ = 1.4 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05379234 Pigeon Creek at York, Wis.

Location.--NW¼NW¼ sec. 29, T. 23 N., R. 6 W., Jackson County, at bridge on County Trunk G, at York.

Drainage area.--29.6 mi^2. Tributary to.--Trempealeau River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 18, 1970, 16.4 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 11 ft^3/s, $Q_{7,10}$ = 8.7 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05379236 Timber Creek at York, Wis.

Location.--NE¼NE¼ sec. 30, T. 23 N., R. 6 W., Jackson County, at mouth, at York.

Drainage area.--4.78 mi^2. Tributary to.--Pigeon Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 18, 1970, 2.19 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 1.6 ft^3/s, $Q_{7,10}$ = 1.0 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05379238 Schermerhorn Creek near York, Wis.

Location.--NE¼SE¼ sec. 32, T. 23 N., R. 6 W., Jackson County, at bridge on country road, 1.7 mi southeast of York.

Drainage area.--3.10 mi^2. Tributary to.--Pigeon Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 18, 1970, 0.47 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.46 ft^3/s, $Q_{7,10}$ = 0.26 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05379240 Schermerhorn Creek near York, Wis.

Location.--SW¼SE¼ sec. 25, T. 23 N., R. 7 W., Trempealeau County, at bridge on State Highway 121, 1.5 mi southwest of York.

Drainage area.--6.05 mi^2. Tributary to.--Pigeon Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 18, 1970, 1.46 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 1.3 ft^3/s, $Q_{7,10}$ = 0.79 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05379242 Pigeon Creek near Pigeon Falls, Wis.

Location.--NW¼NE¼ sec. 35, T. 23 N., R. 7 W., Trempealeau County, at bridge on country road, 1.2 mi northeast of Pigeon Falls.

Drainage area.--43.8 mi^2. Tributary to.--Trempealeau River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 19, 1970, 23.9 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 17 ft^3/s, $Q_{7,10}$ = 13 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05379244 Big Slough near Pigeon Falls, Wis.

Location.--NW¼SE¼ sec. 1, T. 22 N., R. 7 W., Trempealeau County, just upstream from confluence with Tuff Coulee, 2.1 mi southeast of Pigeon Falls.

Drainage area.--4.74 mi^2. Tributary to.--Pigeon Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 19, 1970, 0.94 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.89 ft^3/s, $Q_{7,10}$ = 0.54 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

Table 1.--Low-flow characteristics for sites in the Trempealeau-Black River basin--Continued

05379246 Tuff Coulee near Pigeon Falls, Wis.

Location.--NW¼SE¼ sec. 1, T. 22 N., R. 7 W., Trempealeau County, at mouth, 2.1 mi southeast of Pigeon Falls.

Drainage area.--2.40 mi^2. Tributary to.--Big Slough.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 19, 1970, 0.44 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.42 ft^3/s, $Q_{7,10}$ = 0.24 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05379248 Big Slough near Pigeon Falls, Wis.

Location.--NE¼NE¼ sec. 35, T. 23 N., R. 7 W., Trempealeau County, at bridge on State Highway 121, 1.2 mi northeast of Pigeon Falls.

Drainage area.--8.55 mi^2. Tributary to.--Pigeon Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 19, 1970, 1.99 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 1.8 ft^3/s, $Q_{7,10}$ = 1.2 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05379249 Pigeon Creek at Pigeon Falls, Wis.

Location.--SW¼SE¼ sec. 34, T. 23 N., R. 7 W., Trempealeau County, 300 ft downstream from dam in Pigeon Falls

Drainage area.--58.4 mi^2. Tributary to.--Trempealeau River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 10, 1972, 31.3 ft^3/s; June 27, 1973, 77.1 ft^3/s; Sept. 12, 1973, 44.1 ft^3/s; Aug. 20, 1976, 25.2 ft^3/s; Sept. 14, 1977, 21.5 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 20 ft^3/s, $Q_{7,10}$ = 14 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 5 discharge measurements.

Accuracy.--$SE_{7,10}$ = 19 percent (basin average).

05379254 Pigeon Creek near Pigeon Falls, Wis.

Location.--NW¼NW¼ sec. 9, T. 22 N., R. 7 W., Trempealeau County, just upstream from confluence with Moe Coulee, 2.3 mi southwest of Pigeon Falls.

Drainage area.--65.7 mi^2. Tributary to.--Trempealeau River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 19, 1970, 33.4 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 25 ft^3/s, $Q_{7,10}$ = 20 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

Table 1.--Low-flow characteristics for sites in the Trempealeau-Black River basin--Continued

05379257 Moe Coulee near Pigeon Falls, Wis.

Location.--NE¼NE¼ sec. 8, T. 22 N., R. 7 W., Trempealeau County, at mouth, 2.3 mi southwest of Pigeon Falls.

Drainage area.--2.74 mi^2. Tributary to.--Pigeon Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 19, 1970, 0.75 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.64 ft^3/s, $Q_{7,10}$ = 0.39 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05379260 Fitch Coulee near Pigeon Falls, Wis.

Location.--SW¼NW¼ sec. 9, T. 22 N., R. 7 W., Trempealeau County, at bridge on U.S. Highway 53, 2.4 mi southwest of Pigeon Falls.

Drainage area.--4.82 mi^2. Tributary to.--Pigeon Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 19, 1970, 1.33 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 1.1 ft^3/s, $Q_{7,10}$ = 0.72 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05379263 Johnson Coulee near Whitehall, Wis.

Location.--SE¼NW¼ sec. 18, T. 22 N., R. 7 W., Trempealeau County, at culvert on country road, 2.4 mi northeast of Whitehall.

Drainage area.--2.10 mi^2. Tributary to.--Pigeon Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 19, 1970, 0.53 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.46 ft^3/s, $Q_{7,10}$ = 0.27 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05379264 Pigeon Creek near Whitehall, Wis.

Location.--SE¼SW¼ sec. 18, T. 22 N., R. 7 W., Trempealeau County, at bridge on country road, 2.1 mi northeast of Whitehall.

Drainage area.--80.4 mi^2. Tributary to.--Trempealeau River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 12, 1970, 40.3 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 29 ft^3/s, $Q_{7,10}$ = 23 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

Table 1.--Low-flow characteristics for sites in the Trempealeau-Black River basin--Continued

05379266 Pigeon Creek near Whitehall, Wis.

Location.--NW¼NE¼ sec. 24, T. 22 N., R. 8 W., Trempealeau County, at bridge on U.S. Highway 53, 1.2 mi northeast of Whitehall.

Drainage area.--82.5 mi^2. Tributary to.--Trempealeau River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 19, 1970, 41.7 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 31 ft^3/s, $Q_{7,10}$ = 25 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05379268 Fly Creek near Blair, Wis.

Location.--SW¼SW¼ sec. 27, T. 22 N., R. 7 W., Trempealeau County, at bridge on County Trunk S, 4.0 mi north of Blair.

Drainage area.--2.99 mi^2. Tributary to.--Pigeon Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 19, 1970, 0.69 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.62 ft^3/s, $Q_{7,10}$ = 0.37 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05379270 Fly Creek tributary near Blair, Wis.

Location.--SW¼SW¼ sec. 27, T. 22 N., R. 7 W., Trempealeau County, at mouth, 4.0 mi north of Blair.

Drainage area.--2.06 mi^2. Tributary to.--Fly Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 19, 1970, <0.1 ft^3/s (estimate).

05379273 Fly Creek near Whitehall, Wis.

Location.--SW¼NW¼ sec. 29, T. 22 N., R. 7 W., Trempealeau County, at private road, 2.6 mi east of Whitehall.

Drainage area.--8.74 mi^2. Tributary to.--Pigeon Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 19, 1970, 2.25 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 2.0 ft^3/s, $Q_{7,10}$ = 1.3 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05379275 Fly Creek near Whitehall, Wis.

Location.--SW¼NE¼ sec. 24, T. 22 N., R. 8 W., Trempealeau County, at bridge on country road, 1.3 mi east of Whitehall.

Drainage area.--10.2 mi^2. Tributary to.--Pigeon Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 19, 1970, 2.60 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 2.5 ft^3/s, $Q_{7,10}$ = 1.5 ft^3/s.

Basis of estimate.--Used regression equations 5 and 7.

Accuracy.--$SE_{7,2}$ = 10 percent, $SE_{7,10}$ = 17 percent.

05379276 Trempealeau River at Whitehall, Wis.

Location.--SE¼NW¼ sec. 23, T. 22 N., R. 8 W., Trempealeau County, at U.S. Highway 53 bridge, at Whitehall.

Drainage area.--317 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 10, 1972, 159 ft^3/s; June 27, 1972, 391 ft^3/s; Sept. 12, 1973, 243 ft^3/s; Aug. 20, 1976, 125 ft^3/s; Sept. 14, 1977, 105 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 93 ft^3/s, $Q_{7,10}$ = 63 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 5 discharge measurements.

Accuracy.--$SE_{7,10}$ = 19 percent (basin average).

05379278 Trempealeau River near Whitehall, Wis.

Location.--NE¼SE¼ sec. 20, T. 22 N., R. 8 W., Trempealeau County, at bridge on State Highway 121, 2.5 mi west of Whitehall.

Drainage area.--330 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 12, 1970, 139 ft^3/s.

05379296 Elk Creek near Independence, Wis.

Location.--SE¼NW¼ sec. 31, T. 23 N., R. 8 W., Trempealeau County, at bridge on State Highway 93, just upstream from confluence with Chimney Rock Creek, 5.1 mi north of Independence.

Drainage area.--62.4 mi^2. Tributary to.--Trempealeau River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 12, 1970, 22.1 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 17 ft^3/s, $Q_{7,10}$ = 13 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05379299 Chimney Rock Creek near Independence, Wis.

Location.--SE¼NW¼ sec. 31, T. 23 N., R. 8 W., Trempealeau County, at bridge on State Highway 93, at mouth, 5.1 mi north of Independence.

Drainage area.--22.7 mi^2. Tributary to.--Elk Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 12, 1970, 9.74 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 7.1 ft^3/s, $Q_{7,10}$ = 5.1 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05379300 Elk Creek at Elk Creek, Wis.

Location.--NE¼SW¼ sec. 31, T. 23 N., R. 8 W., at State Highway 93, 0.2 mi north of Elk Creek.

Drainage area.--90.1 mi^2. Tributary to.--Trempealeau River.

Type of site.--Low-flow partial-record station.

Minimum discharge measured.--15.4 ft^3/s, Aug. 14, 1964.

Low-flow frequency.--$Q_{7,2}$ = 23 ft^3/s, $Q_{7,10}$ = 16 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 10 discharge measurements made during the period 1964-77.

Accuracy.--$SE_{7,2}$ = 5 percent, $SE_{7,10}$ = 8 percent.

05379320 Elk Creek at Independence, Wis.

Location.--SE¼NW¼ sec. 25, T. 22 N., R. 9 W., Trempealeau County, at State Highways 93 and 121 bridge, in Independence.

Drainage area.--101 mi^2. Tributary to.--Trempealeau River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 10, 1972, 53.0 ft^3/s; June 27, 1973, 116 ft^3/s; Sept. 12, 1973, 75.1 ft^3/s; Aug. 20, 1976, 39.4 ft^3/s; Sept. 14, 1977, 28.4 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 26 ft^3/s, $Q_{7,10}$ = 17 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 5 discharge measurements.

Accuracy.--$SE_{7,10}$ = 19 percent (basin average).

05379400 Trempealeau River at Arcadia, Wis.

Location.--NW¼SW¼ sec. 32, T. 21 N., R. 9 W., at State Highways 93 and 95, in Arcadia.

Drainage area.--552 mi^2. Tributary to.--Mississippi River.

Type of site.--Gaging station.

Period of record.--July 1960 to September 1976.

Average discharge.--16 years, 396 ft^3/s.

Extremes.--Maximum discharge, 15,900 ft^3/s Aug. 23, 1975; minimum discharge observed, 110 ft^3/s Aug. 8, 9, and 19, 1964.

Period of consecutive days	Magnitude and frequency of annual low flow. Discharge, in cubic feet per second, for indicated recurrence interval, in years					
	2	5	10	20	50	100
7	165	133	118	108	97	90
14	170	137	122	112	100	94
30	179	145	130	119	109	101
60	194	158	142	130	119	111
90	208	169	153	140	128	121

Duration table of daily flow. Discharge, in cubic feet per second, which was exceeded for indicated percent of time							
Percent	2	5	10	20	30	40	50
ft^3/s	1,520	900	625	450	380	330	292
Percent	60	70	80	90	95	98	99.9
ft^3/s	261	235	211	184	168	151	120

Accuracy.--$SE_{7,2}$ = 4 percent, $SE_{7,10}$ = 5 percent.

Remarks.--The frequency analyses for the 7-, 14-, 30-, 60-, and 90-day low flows are based on the extension of records with 05379500 Trempealeau River at Dodge (1915-19, 1936-76 CY). All correlation coefficients are greater than 0.99.

05379407 Meyers Valley at Arcadia, Wis.

Location.--NW¼NE¼ sec. 6, T. 20 N., R. 9 W., Trempealeau County, at bridge on country road, 0.4 mi south of Arcadia.

Drainage area.--5.57 mi^2. Tributary to.--Trempealeau River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 19, 1976, 1.28 ft^3/s; Aug. 8, 1977, 1.22 ft^3/s; Sept. 14, 1977, 1.28 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 1.2 ft^3/s, $Q_{7,10}$ = 0.76 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05379500 Trempealeau River at Dodge, Wis.

Location.--NE¼SE¼ sec. 10, T. 19 N., R. 10 W., Trempealeau County, at bridge on town road, in Dodge.

Drainage area.--643 mi^2. Tributary to.--Mississippi River.

Type of site.--Gaging station.

Period of record.--December 1913 to September 1919, April 1934 to September 1976.

Average discharge.--47 years, 412 ft^3/s.

Extremes.--Maximum discharge, 17,400 ft^3/s Apr. 4, 1956; minimum daily, 98 ft^3/s Jan. 10, 1938.

Period of consecutive days	Magnitude and frequency of annual low flow. Discharge, in cubic feet per second, for indicated recurrence interval, in years					
	2	5	10	20	50	100
7	179	141	124	112	100	92
14	185	146	129	117	104	96
30	195	156	138	125	112	104
60	212	170	151	138	125	117
90	228	182	163	149	135	127

Duration table of daily flow. Discharge, in cubic feet per second, which was exceeded for indicated percent of time							
Percent	2	5	10	20	30	40	50
ft^3/s	1,600	970	660	472	390	340	300
Percent	60	70	90	90	95	98	99.9
ft^3/s	270	240	212	183	165	145	113

Accuracy.--$SE_{7,2}$ = 4 percent, $SE_{7,10}$ = 6 percent.

05379550 Tamarack Creek near Galesville, Wis.

Location.--SE¼NW¼ sec. 21, T. 19 N., R. 9 W., Trempealeau County, at bridge on country road, 5.4 mi northwest of Galesville.

Drainage area.--34.8 mi^2. Tributary to.--Trempealeau River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 11, 1970, 7.15 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 6.6 ft^3/s, $Q_{7,10}$ = 4.5 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05379570 Tamarack Creek near Centerville, Wis.

Location.--SE¼SW¼ sec. 36, T. 19 N., R. 10 W., Trempealeau County, at bridge on County Trunk G, 3.8 mi west of Centerville.

Drainage area.--44.8 mi^2. Tributary to.--Trempealeau River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 11, 1970, 2.85 ft^3/s.

Table 1.--Low-flow characteristics for sites in the Trempealeau-Black River basin--Continued

05380000 Trempealeau River near Trempealeau, Wis.

Location.--SW¼NE¼ sec. 12, T. 18 N., R. 10 W., Trempealeau County, at country road, 5.0 mi northwest of Trempealeau.

Drainage area.--722 mi^2. Tributary to.--Mississippi River.

Type of site.--Gaging station.

Period of record.--October 1931 to September 1934 (seasonal records).

Average discharge.--Not applicable.

Extremes.--Maximum discharge, 9,100 ft^3/s Apr. 5, 1934; minimum, 150 ft^3/s Aug. 12-16, 1933, Aug. 29-Sept. 2, 1933, June 23, 1934.

Low-flow frequency.--$Q_{7,2}$ = 190 ft^3/s, $Q_{7,10}$ = 150 ft^3/s.

Basis of estimate.--Correlated with Buffalo River near Tell using 11 daily mean discharges in the period 1932-34.

Accuracy.--$SE_{7,2}$ = 11 percent, $SE_{7,10}$ = 13 percent.

05380801 Black River near Whittlesey, Wis.

Location.--SW¼SE¼ sec. 33, T. 32 N., R. 1 E., Taylor County, at bridge on County Trunk M, 2.0 mi southwest of Whittlesey.

Drainage area.--31.2 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 11, 1970, 2.48 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 1.5 ft^3/s, $Q_{7,10}$ = 0.60 ft^3/s.

Basis of estimate.--Used regression equations 9 and 10.

Accuracy.--$SE_{7,2}$ = 45 percent, $SE_{7,10}$ = 76 percent.

05380805 Black River at Medford, Wis.

Location.--SE¼SE¼ sec. 21, T. 31 N., R. 1 E., Taylor County, at bridge on town road, 0.9 mi northwest of center of Medford.

Drainage area.--42.3 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurements.--Oct. 23, 1968, 20.5 ft^3/s; Aug. 26, 1969, 3.07 ft^3/s.

Low-flow frequency.--Unable to determine low-flow characteristics, additional measurements required.

05380807 Black River at Medford, Wis.

Location.--SE¼NW¼ sec. 34, T. 31 N., R. 1 E., Taylor County, at sewage-treatment plant at south city limit of Medford.

Drainage area.--44.0 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Minimum discharge measured.--1.41 ft^3/s, Aug. 31, 1976.

Low-flow frequency.--$Q_{7,2}$ = 3.4 ft^3/s, $Q_{7,10}$ = 0.81 ft^3/s.

Basis of estimate.--Correlated with Black River at Neillsville using 11 discharge measurements made during the period 1968-76.

Accuracy.--$SE_{7,2}$ = 42 percent, $SE_{7,10}$ = 47 percent.

Table 1.--Low-flow characteristics for sites in the Trempealeau-Black River basin--Continued

05380817 East Branch Little Black River near Medford, Wis.

Location.--NE¼SE¼ sec. 29, T. 31 N., R. 2 E., Taylor County, at bridge on State Highway 64, 4.6 mi east of Medford.

Drainage area.-- Tributary to.--Little Black River.

Type of site.--Miscellaneous site.

Discharge measurement.--May 24, 1963, 9.08 ft^3/s.

05380820 Little Black River near Medford, Wis.

Location.--SW¼ sec. 1, T. 30 N., R. 1 E., Taylor County, at bridge on State Highway 13, 2.1 mi south of Medford.

Drainage area.--58 mi^2 (approximate). Tributary to.--Black River.

Type of site.--Low-flow partial-record station.

Minimum discharge measured.--0.04 ft^3/s, Aug. 5, 1964.

Low-flow frequency.--$Q_{7,2}$ = 0.26 ft^3/s, $Q_{7,10}$ = 0.01 ft^3/s.

Basis of estimate.--Correlated with Black River at Neillsville using 11 discharge measurements made during the period 1962-69.

Accuracy.--$SE_{7,2}$ = 24 percent, $SE_{7,10}$ = 66 percent.

05380825 Black River near Medford, Wis.

Location.--SW¼SW¼ sec. 2, T. 30 N., R. 1 E., Taylor County, on country road, 2.0 mi south of Medford.

Drainage area.--112 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 11, 1970, 6.54 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 4.4 ft^3/s, $Q_{7,10}$ = 1.5 ft^3/s.

Basis of estimate.--Used regression equations 9 and 10.

Accuracy.--$SE_{7,2}$ = 45 percent, $SE_{7,10}$ = 76 percent.

05380830 Black River near Medford, Wis.

Location.--SW¼SE¼ sec. 25, T. 31 N., R. 1 W., Taylor County, at bridge on State Highway 64, 4.6 mi west of Medford.

Drainage area.--131 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurements.--Oct. 23, 1968, 34.2 ft^3/s; Aug. 26, 1969, 6.06 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 5.1 ft^3/s, $Q_{7,10}$ = 1.8 ft^3/s.

Basis of estimate.--Used equations 9 and 10.

Accuracy.--$SE_{7,2}$ = 45 percent, $SE_{7,10}$ = 76 percent.

05380850 Black River near Lublin, Wis.

Location.--NE¼NW¼ sec. 1, T. 30 N., R. 2 W., Taylor County, at bridge on State Highway 64, 8.3 mi northeast of Lublin.

Drainage area.--195 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurements.--Oct. 23, 1968, 61.5 ft^3/s; Aug. 26, 1969, 12.2 ft^3/s.

Table 1.--Low-flow characteristics for sites in the Trempealeau-Black River basin--Continued

05380870 Pine Creek near Medford, Wis.

Location.--SW¼SW¼ sec. 19, T. 30 N., R. 1 W., Taylor County, at bridge on County Trunk DD, 11.8 mi southwest of Medford.

Drainage area.--34.3 mi^2. Tributary to.--Black River.

Type of site.--Low-flow partial-record station.

Minimum discharge measured.--0.20 ft^3/s, Aug. 5, 1964.

Low-flow frequency.--$Q_{7,2}$ = 0.58 ft^3/s, $Q_{7,10}$ = 0.12 ft^3/s.

Basis of estimate.--Correlated with Black River at Neillsville using 14 discharge measurements made during the period 1962-70.

Accuracy.--$SE_{7,2}$ = 13 percent, $SE_{7,10}$ = 32 percent.

05380879 McKenzie Creek near Lublin, Wis.

Location.--SW¼SE¼ sec. 20, T. 30 N., R. 2 W., Taylor County, at bridge on country road, 4.0 mi east of Lublin.

Drainage area.--22.6 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 11, 1970, 0.59 ft^3/s.

Low-flow frequency.--Unable to define low-flow characteristics, additional discharge measurements are required.

05380880 McKenzie Creek near Lublin, Wis.

Location.--SE¼SE¼ sec. 29, T. 30 N., R. 2 W., Taylor County, at bridge on country road, 0.4 mi upstream from mouth, 4.6 mi southeast of Lublin.

Drainage area.--23.5 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurements.--Oct. 24, 1968, 7.00 ft^3/s; Aug. 26, 1969, 0.46 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.34 ft^3/s, $Q_{7,10}$ = 0.03 ft^3/s.

Basis of estimate.--Correlated with Black River near Neillsville using 3 discharge measurements.

Accuracy.--$SE_{7,10}$ = 68 percent.

05380885 Black River near Withee, Wis.

Location.--NE¼NW¼ sec. 17, T. 29 N., R. 2 W., Clark County, at bridge on country road, 4.2 mi northwest of Withee.

Drainage area.--302 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurements.--Oct. 24, 1968, 92.5 ft^3/s; Aug. 27, 1969, 15.1 ft^3/s

05380886 Black River near Withee, Wis.

Location.--NE¼NE¼ sec. 5, T. 28 N., R. 2 W., Clark County, at bridge on State Highways 29 and 73, 2.4 mi southeast of Withee.

Drainage area.--316 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 12, 1970, 17.6 ft^3/s.

Table 1.--Low-flow characteristics for sites in the Trempealeau-Black River basin--Continued

05380887 East Fork Poplar River near Curtiss, Wis.

Location.--NE¼NW¼ sec. 5, T. 28 N., R. 1 E., Clark County, at culvert on State Highway 29, 1.4 mi southeast of Curtiss.

Drainage area.--1.16 mi^2. Tributary to.--South Fork Poplar River.

Type of site.--Miscellaneous site.

Discharge measurements.--Sept. 30, 1976, 0 ft^3/s; Oct. 18, 1976, 0 ft^3/s; Nov. 10, 1976, 0 ft^3/s; Dec. 1, 1976, 0 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.00 ft^3/s, $Q_{7,10}$ = 0.00 ft^3/s.

Basis of estimate.--Correlated with Black River at Neillsville using 4 discharge measurements.

Accuracy.--Not applicable.

05380889 South Fork Poplar River near Riplinger, Wis.

Location.--NW¼SE¼ sec. 23, T. 28 N., R. 1 W., Clark County, at bridge on County Trunk N, 5.3 mi northwest of Riplinger.

Drainage area.--49.2 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 11, 1970, 0.90 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.56 ft^3/s, $Q_{7,10}$ = 0.16 ft^3/s.

Basis of estimate.--Used regression equations 9 and 10.

Accuracy.--$SE_{7,2}$ = 45 percent, $SE_{7,10}$ = 76 percent.

05380890 South Fork Poplar River near Owen, Wis.

Location.--NE¼NE¼ sec. 16, T. 28 N., R. 1 W., Clark County, at bridge on country road, 4.0 mi southeast of Owen.

Drainage area.--58.1 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurements.--Oct. 24, 1968, 6.62 ft^3/s; Aug. 27, 1969, 0.94 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.75 ft^3/s, $Q_{7,10}$ = 0.21 ft^3/s.

Basis of estimate.--Used regression equations 9 and 10.

Accuracy.--$SE_{7,2}$ = 45 percent, $SE_{7,10}$ = 76 percent.

05380891 North Fork Poplar River at Dorchester, Wis.

Location.--NE¼NE¼ sec. 14, T. 29 N., R. 1 E., Clark County, at sewage-treatment plant, at Dorchester.

Drainage area.--2.37 mi^2. Tributary to.--Poplar River.

Type of site.--Miscellaneous site.

Minimum discharge measured.--<0.01 ft^3/s, Oct. 16, 1973, July 29, 1974, Sept. 5, 1974, Aug. 18, 1975.

Low-flow frequency.--$Q_{7,2}$ = 0.00 ft^3/s, $Q_{7,10}$ = 0.00 ft^3/s.

Basis of estimate.--Correlated with Black River at Neillsville using 6 discharge measurements made during the period 1973-75.

Accuracy.--Not applicable.

05380893 North Fork Poplar River tributary at Curtiss, Wis.

Location.--NW¼NE¼ sec. 36, T. 29 N., R. 1 W., Clark County, at country road bridge, 0.5 mi northwest of Curtiss.

Drainage area.--0.66 mi^2. Tributary to.--North Fork Poplar River.

Type of site.--Miscellaneous site.

Minimum discharge measured.--0.00 ft^3/s, June 30, 1973, Aug. 7, 1973, Oct. 6, 1973, July 30, 1974, Sept. 5, 1974, and Aug. 18, 1975.

Low-flow frequency.--$Q_{7,2}$ = 0.00 ft^3/s, $Q_{7,10}$ = 0.00 ft^3/s.

Basis of estimate.--Correlated with Black River near Neillsville using 6 discharge measurements.

Accuracy.--Not applicable.

05380895 North Fork Poplar River near Owen, Wis.

Location.--NE¼NE¼ sec. 5, T. 28 N., R. 1 W., Clark County, at bridge on State Highway 29, 2.1 mi east of Owen.

Drainage area.--55.6 mi^2. Tributary to.--Poplar River.

Type of site.--Miscellaneous site.

Minimum discharge measured.--0.10 ft^3/s, Aug. 18, 1975.

Low-flow frequency.--$Q_{7,2}$ = 0.49 ft^3/s, $Q_{7,10}$ = 0.07 ft^3/s.

Basis of estimate.--Correlated with Black River at Neillsville using 9 discharge measurements made during the period 1968-76.

Accuracy.--$SE_{7,2}$ = 26 percent, $SE_{7,10}$ = 59 percent.

05380897 Poplar River at Owen, Wis.

Location.--NE¼NW¼ sec. 1, T. 28 N., R. 2 W., Clark County, at sewage-treatment plant, at Owen.

Drainage area.--145 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Minimum discharge measured.--0.21 ft^3/s, Sept. 5, 1974.

Low-flow frequency.--$Q_{7,2}$ = 1.5 ft^3/s, $Q_{7,10}$ = 0.28 ft^3/s.

Basis of estimate.--Correlated with Black River at Neillsville using 7 discharge measurements made during the period 1973-76.

Accuracy.--$SE_{7,2}$ = 42 percent, $SE_{7,10}$ = 77 percent.

05380900 Poplar River near Owen, Wis.

Location.--NE¼NW¼ sec. 25, T. 28 N., R. 2 W., Clark County, at bridge on County Trunk N, 4.2 mi south of Owen.

Drainage area.--157 mi^2. Tributary to.--Black River.

Type of site.--Low-flow partial-record station.

Minimum discharge measured.--1.1 ft^3/s, Aug. 15, 1964.

Low-flow frequency.--$Q_{7,2}$ = 3.7 ft^3/s, $Q_{7,10}$ = 1.2 ft^3/s.

Basis of estimate.--Correlated with Black River at Neillsville using 20 discharge measurements and daily mean discharges made during the period 1961-70.

Accuracy.--$SE_{7,2}$ = 22 percent, $SE_{7,10}$ = 30 percent.

Remarks.--Operated as a continuous-record gaging station during open-water periods in 1964-66 water years.

05380915 Black River at Greenwood, Wis.

Location.--NW¼NE¼ sec. 3, T. 26 N., R. 2 W., Clark County, at bridge on County Trunk G, at Greenwood.

Drainage area.--524 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurements.--Oct. 25, 1968, 128 ft^3/s; Aug. 28, 1969, 21.6 ft^3/s; Aug. 12, 1970, 39.4 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 23 ft^3/s, $Q_{7,10}$ = 5.8 ft^3/s.

Basis of estimate.--Correlated with Black River at Neillsville using 3 discharge measurements.

Accuracy.--$SE_{7,10}$ = 68 percent (basin average).

05380935 Nelson Creek near Greenwood, Wis.

Location.--NE¼SW¼ sec. 28, T. 27 N., R. 1 W., Clark County, at bridge on country road, 4.7 mi northeast of Greenwood.

Drainage area.--28.1 mi^2. Tributary to.--Rock Creek.

Type of site.--Miscellaneous site.

Discharge measurements.--Oct. 25, 1968, 2.39 ft^3/s; Aug. 28, 1969, 0.51 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.38 ft^3/s, $Q_{7,10}$ = 0.11 ft^3/s.

Basis of estimate.--Used regression equations 9 and 10.

Accuracy.--$SE_{7,2}$ = 45 percent, $SE_{7,10}$ = 76 percent.

05380945 Bear Creek at Loyal, Wis.

Location.--SW¼SW¼ sec. 10, T. 26 N., R. 1 W., Clark County, at bridge on County Trunk K, upstream from sewage-treatment plant, at Loyal.

Drainage area.--2.97 mi^2. Tributary to.--Rock Creek.

Type of site.--Miscellaneous site.

Minimum discharge measured.--0 ft^3/s (ponded), Sept. 5, 1974, Aug. 19, 1975.

Low-flow frequency.--$Q_{7,2}$ = 0.08 ft^3/s, $Q_{7,10}$ = 0.03 ft^3/s.

Basis of estimate.--Correlated with Black River at Neillsville using 8 discharge measurement made during the period 1972-76.

Accuracy.--$SE_{7,10}$ = 68 percent (basin average).

05380950 Rock Creek at Greenwood, Wis.

Location.--SE¼SE¼ sec. 3, T. 26 N., R. 2 W., Clark County, at bridge on State Highway 73, 0.5 mi south of Greenwood.

Drainage area.--78.4 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Minimum discharge measured.--0.16 ft^3/s, Aug. 31, 1976.

Low-flow frequency.--$Q_{7,2}$ = 0.88 ft^3/s, $Q_{7,10}$ = 0.12 ft^3/s.

Basis of estimate.--Correlated with Black River near Neillsville using 11 discharge measurements made during the period 1968-76.

Accuracy.--$SE_{7,2}$ = 20 percent, $SE_{7,10}$ = 47 percent.

Table 1.--Low-flow characteristics for sites in the Trempealeau-Black River basin--Continued

05380965 Cawley Creek near Loyal, Wis.

Location.--SE¼SE¼ sec. 24, T. 26 N., R. 2 W., Clark County, at bridge on town road, 3.7 mi southwest of Loyal.

Drainage area.--5.14 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurements.--Sept. 5, 1974, 0.20 ft^3/s; Aug. 19, 1975, 0.15 ft^3/s; Aug. 23, 1977, 0.12 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.11 ft^3/s, $Q_{7,10}$ = 0.02 ft^3/s.

Basis of estimate.--Correlated with Black River at Neillsville using 3 discharge measurements.

Accuracy.--$SE_{7,10}$ = 68 percent (basin average).

05380970 Cawley Creek near Neillsville, Wis.

Location.--SW¼ sec. 25, T. 25 N., R. 2 W., Clark County, at bridge on State Highway 73, 3.7 mi north of Neillsville.

Drainage area.--38.6 mi^2. Tributary to.--Black River.

Type of site.--Low-flow partial-record station.

Minimum discharge measured.--0.08 ft^3/s, Aug. 5, 1964.

Low-flow frequency.--$Q_{7,2}$ = 0.53 ft^3/s, $Q_{7,10}$ = 0.09 ft^3/s.

Basis of estimate.--Correlated with Black River near Neillsville using 16 discharge measurements made during the period 1962-70.

Accuracy.--$SE_{7,2}$ = 20 percent, $SE_{7,10}$ = 42 percent.

05380980 North Branch O'Neill Creek near Neillsville, Wis.

Location.--NE¼SW¼ sec. 7, T. 24 N., R. 1 W., Clark County, at bridge on country road, 2.4 mi northeast of of Neillsville.

Drainage area.--34.5 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurements.--Oct. 25, 1968, 3.23 ft^3/s; Aug. 28, 1969, 0.32 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.38 ft^3/s, $Q_{7,10}$ = 0.10 ft^3/s.

Basis of estimate.--Used regression equations 9 and 10.

Accuracy.--$SE_{7,2}$ = 45 percent, $SE_{7,10}$ = 76 percent.

05380985 South Branch O'Neill Creek at Granton, Wis.

Location.--NW¼SE¼ sec. 2, T. 24 N., R. 1 W., Clark County, at sewage-treatment plant, 0.2 mi downstream from County Trunk K bridge, at Granton.

Drainage area.--16.9 mi^2. Tributary to.--O'Neill Creek.

Type of site.--Miscellaneous site.

Minimum discharge measured.--0.17 ft^3/s, Aug. 31, 1976.

Low-flow frequency.--$Q_{7,2}$ = 0.30 ft^3/s, $Q_{7,10}$ = 0.07 ft^3/s.

Basis of estimate.--Correlated with Black River at Neillsville using 10 discharge measurements made during the period 1972-77.

Accuracy.--$SE_{7,2}$ = 19 percent, $SE_{7,10}$ = 42 percent.

05380990 South Branch O'Neill Creek near Neillsville, Wis.

Location.--NE¼NE¼ sec. 18, T. 24 N., R. 1 W., Clark County, at bridge on country road, 3.0 mi east of Neillsville.

Drainage area.--22.8 mi^2. Tributary to.--O'Neill Creek.

Type of site.--Miscellaneous site.

Discharge measurements.--Oct. 25, 1968, 2.54 ft^3/s; Aug. 28, 1969, 0.75 ft^3/s; Aug. 13, 1970, 0.70 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.41 ft^3/s, $Q_{7,10}$ = 0.10 ft^3/s.

Basis of estimate.--Correlated with Black River at Neillsville using 3 discharge measurements.

Accuracy.--$SE_{7,10}$ = 68 percent (basin average).

05381000 Black River at Neillsville, Wis.

Location.--NW¼SW¼ sec. 15, T. 24 N., R. 2 W., on right bank at downstream side of bridge on U.S. Highway 10, in Neillsville, 1 mi downstream from O'Neill Creek.

Drainage area.--756 mi^2. Tributary to.--Mississippi River.

Type of site.--Gaging station.

Period of record.--April 1905 to March 1909, October 1913 to September 1976. Monthly discharge only for some periods.

Average discharge.--66 years, 580 ft^3/s.

Extremes.--Maximum discharge, 48,800 ft^3/s Sept. 10, 1938; minimum discharge, 0.6 ft^3/s Aug. 15, 1936.

Period of consecutive days	Magnitude and frequency of annual low flow Discharge, in cubic feet per second, for indicated recurrence interval, in years					
	2	5	10	20	50	100
7	26	12	6.6	3.6	1.6	0.90
14	28	13	7.9	4.5	2.3	1.3
30	33	17	12	7.6	4.6	3.3
60	44	24	17	13	8.4	6.2
90	59	33	25	19	14	11

Duration table of daily flow Discharge, in cubic feet per second, which was exceeded for indicated percent of time							
Percent	2	5	10	20	30	40	50
ft^3/s	5,200	2,720	1,400	590	300	182	125
Percent	60	70	80	90	95	98	99.9
ft^3/s	90	67	47	33	25	15	2.6

Accuracy.--$SE_{7,2}$ = 9 percent, $SE_{7,10}$ = 23 percent.

05381010 Cunningham Creek at Lynn, Wis.

Location.--SE¼SW¼ sec. 5, T. 24 N., R. 1 E., Clark County, at bridge on U.S. Highway 10, at Lynn.

Drainage area.--2.62 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 19, 1976, 0.06 ft^3/s; Aug. 31, 1976, 0.08 ft^3/s; Aug. 23, 1977, 0.06 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.08 ft^3/s, $Q_{7,10}$ = 0.02 ft^3/s.

Basis of estimate.--Correlated with Black River at Neillsville using 3 discharge measurements.

Accuracy.--$SE_{7,10}$ = 68 percent (basin average).

Table 1.--Low-flow characteristics for sites in the Trempealeau-Black River basin--Continued

05381040 Cunningham Creek near Neillsville, Wis.

Location.--NE¼SE¼ sec. 5, T. 23 N., R. 1 W., Clark County, at country road, 5.7 mi southeast of Neillsville.

Drainage area.--38.9 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurements.--Oct. 24, 1968, 3.98 ft^3/s; Aug. 28, 1969, 0.84 ft^3/s.

Low-flow frequency.--Unable to determine low-flow characteristics, additional discharge measurements are required.

05381055 Cunningham Creek near Neillsville, Wis.

Location.--SE¼NE¼ sec. 35, T. 24 N., R. 2 W., Clark County, at bridge on country road, 3.1 mi south of Neillsville.

Drainage area.--45.2 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 13, 1970, 0.44 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.30 ft^3/s, $Q_{7,10}$ = 0.07 ft^3/s.

Basis of estimate.--Used regression equations 9 and 10.

Accuracy.--$SE_{7,2}$ = 45 percent, $SE_{7,10}$ = 76 percent.

05381060 Cunningham Creek below Jack Creek near Neillsville, Wis.

Location.--SW¼NW¼ sec. 26, T. 24 N., R. 2 W., Clark County, at bridge on State Highways 73 and 95, 2.0 mi south of Neillsville.

Drainage area.--64.2 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurements.--Oct. 25, 1968, 6.29 ft^3/s; Aug. 28, 1969, 0.73 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.41 ft^3/s, $Q_{7,10}$ = 0.10 ft^3/s.

Basis of estimate.--Used regression equations 9 and 10.

Accuracy.--$SE_{7,2}$ = 45 percent, $SE_{7,10}$ = 76 percent.

05381080 Wedges Creek near Globe, Wis.

Location.--NW¼NW¼ sec. 26, T. 25 N., R. 3 W., Clark County, at bridge on country road, 3.3 mi southwest of Globe, 7.5 mi northwest of Neillsville.

Drainage area.--40.7 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurements.--Oct. 25, 1968, 7.89 ft^3/s; Aug. 28, 1969, 2.43 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 1.3 ft^3/s, $Q_{7,10}$ = 0.44 ft^3/s.

Basis of estimate.--Used regression equations 9 and 10.

Accuracy.--$SE_{7,2}$ = 45 percent, $SE_{7,10}$ = 76 percent.

05381090 Wedges Creek near Neillsville, Wis.

Location.--NE¼SE¼ sec. 10, T. 24 N., R. 3 W., Clark County, on U.S. Highway 10, 6.3 mi west of Neillsville.

Drainage area.--60.5 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 13, 1970, 2.45 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 1.6 ft^3/s, $Q_{7,10}$ = 0.54 ft^3/s.

Basis of estimate.--Used regression equations 9 and 10.

Accuracy.--$SE_{7,2}$ = 45 percent, $SE_{7,10}$ = 76 percent.

05381100 Fivemile Creek near Neillsville, Wis.

Location.--SW¼NW¼ sec. 35, T. 24 N., R. 3 W., Clark County, at bridge on country road, 6.8 mi southwest of Neillsville.

Drainage area.--37.1 mi^2. Tributary to.--Wedges Creek.

Type of site.--Miscellaneous site.

Discharge measurements.--Oct. 25, 1968, 11.0 ft^3/s; Aug. 28, 1969, 1.77 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 1.6 ft^3/s, $Q_{7,10}$ = 0.59 ft^3/s.

Basis of estimate.--Used regression equations 9 and 10.

Accuracy.--$SE_{7,2}$ = 45 percent, $SE_{7,10}$ = 76 percent.

05381110 Wedges Creek near Neillsville, Wis.

Location.--NE¼SW¼ sec. 35, T. 24 N., R. 3 W., Clark County, at bridge on country road, 6.5 mi southwest of Neillsville.

Drainage area.--114 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurements.--Oct. 25, 1968, 28.8 ft^3/s; Aug. 28, 1969, 7.20 ft^3/s; Aug. 13, 1970, 9.98 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 6.4 ft^3/s, $Q_{7,10}$ = 1.8 ft^3/s.

Basis of estimate.--Correlated with Black River at Neillsville using 3 discharge measurements.

Accuracy.--$SE_{7,10}$ = 68 percent (basin average).

05381150 East Fork Black River near Pittsville, Wis.

Location.--SE¼SW¼ sec. 19, T. 23 N., R. 2 E., Wood County, at bridge on State Highway 73, 9.1 mi west of Pittsville.

Drainage area.--37.2 mi^2. Tributary to.--Black River.

Type of site.--Low-flow partial-record station.

Minimum discharge measured.--0.00 ft^3/s, Aug. 22, 1962, Aug. 5, 1964, Aug. 22, 1967, Aug. 11, 1970.

Low-flow frequency.--$Q_{7,2}$ = 0.00 ft^3/s, $Q_{7,10}$ = 0.00 ft^3/s.

Basis of estimate.--Correlated with Black River near Neillsville using 12 discharge measurements made during the period 1962-70.

Accuracy.--Not applicable.

Table 1.--Low-flow characteristics for sites in the Trempealeau-Black River basin--Continued

05381157 Rocky Run near Pittsville, Wis.

Location.--NE¼NW¼ sec. 11, T. 22 N., R. 2 E., Wood County, at bridge on County Trunk V, 5.6 mi southwest of Pittsville.

Drainage area.--40.2 mi^2. Tributary to.--East Fork Black River.

Type of site.--Miscellaneous site.

Discharge measurements.--Oct. 23, 1968, 3.01 ft^3/s; Aug. 27, 1969, <0.1 (estimate).

Low-flow frequency.--Unable to determine low-flow characteristics, additional discharge measurements are required.

05381158 East Fork Black River near Pittsville, Wis.

Location.--NW¼NW¼ sec. 23, T. 22 N., R. 2 E., Wood County, at bridge on Peterson Road, 6.7 mi southwest of Pittsville.

Drainage area.--90.1 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 11, 1970, 0 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0 ft^3/s, $Q_{7,10}$ = 0 ft^3/s.

Basis of estimate.--Used regression equations 9 and 10.

Accuracy.--Not applicable.

05381161 Hay Creek near City Point, Wis.

Location.--SW¼SW¼ sec. 20, T. 22 N., R. 2 E., Wood County, at bridge on country road, 1.7 mi northeast of City Point.

Drainage area.--30.7 mi^2. Tributary to.--East Fork Black River.

Type of site.--Miscellaneous site.

Discharge measurements.--Oct. 24, 1968, 4.89 ft^3/s; Aug. 27, 1969, 0 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0 ft^3/s, $Q_{7,10}$ = 0 ft^3/s.

Basis of estimate.--Used regression equations 9 and 10.

Accuracy.--Not applicable.

05381164 East Fork Black River near City Point, Wis.

Location.--SW¼SW¼ sec. 22, T. 22 N., R. 1 E., Jackson County, at bridge on country road, 2.9 mi northwest of City Point.

Drainage area.--160 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurements.--Oct. 24, 1968, 40.0 ft^3/s; Aug. 27, 1969, 2.57 ft^3/s.

05381167 East Fork Black River above Rock Creek near City Point, Wis.

Location.--NE¼NE¼ sec. 9, T. 22 N., R. 1 W., Jackson County, at bridge on country road, 9.4 mi northwest of City Point.

Drainage area.--201 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurements.--Oct. 24, 1968, 56.2 ft^3/s; Aug. 27, 1969, 4.61 ft^3/s; Aug. 11, 1970, 4.10 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 3.2 ft^3/s, $Q_{7,10}$ = 0.98 ft^3/s.

Basis of estimate.--Correlated with Yellow River at Babcock using 3 discharge measurements.

Accuracy.--$SE_{7,10}$ = 68 percent (basin average).

05381170 Rock Creek near Neillsville, Wis.

Location.--SW¼ sec. 26, T. 23 N., R. 2 W., Clark County, at bridge on country road, 8.4 mi south of Neillsville.

Drainage area.--27.8 mi^2. Tributary to.--East Fork Black River.

Type of site.--Low-flow partial-record station.

Minimum discharge measured.--0.00 ft^3/s, ponded with no observable velocities, Aug. 23, 1967, Aug. 18, 1969, Aug. 11, 1970, Aug. 19, 1975.

Low-flow frequency.--$Q_{7,2}$ = 0 ft^3/s, $Q_{7,10}$ = 0 ft^3/s.

Basis of estimate.--Correlated with Yellow River at Babcock based on 16 discharge measurements made during the period 1962-76.

Accuracy.--Not applicable.

05381173 East Fork Black River near Hatfield, Wis.

Location.--SE¼NE¼ sec. 5, T. 22 N., R. 2 W., Jackson County, at bridge on country road, 4.5 mi east of Hatfield.

Drainage area.--252 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 11, 1970, 3.97 ft^3/s.

05381240 Morrison Creek near Hatfield, Wis.

Location.--NE¼NE¼ sec. 22, T. 22 N., R. 3 W., Jackson County, at bridge on County Trunk K, 2.6 mi south of Hatfield.

Drainage area.--102 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 11, 1970, 8.75 ft^3/s.

Low-flow frequency.--Unable to determine low-flow characteristics by the equations. The area for this station includes glaciated area and driftless area.

05381250 Hay Creek near Hatfield,Wis.

Location.--SW¼NW¼ sec. 23, T. 22 N., R. 3 W., Jackson County, at culvert on County Trunk K, 2.8 mi south of Hatfield.

Drainage area.--7.04 mi^2. Tributary to.--Morrison Creek

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 11, 1970, 1.16 ft^3/s.

Low-flow frequency.--Unable to determine low-flow characteristics by the equations. The area for this station includes glaciated area and driftless area.

05381260 Dickey Creek near Hatfield, Wis.

Location.--NE¼SE¼ sec. 33, T. 22 N., R. 3 W., Jackson County, at bridge on country road, 5.1 mi south of Hatfield.

Drainage area.--10.6 mi^2. Tributary to.--Morrison Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 11, 1970, 1.81 ft^3/s.

Low-flow frequency.--Unable to determine low-flow characteristics by the equations. The area for this station includes glaciated area and driftless area.

Table 1.--Low-flow characteristics for sites in the Trempealeau-Black River basin--Continued

05381283 South Fork Halls Creek at Alma Center, Wis.

Location.--SE¼SW¼ sec. 30, T. 22 N., R. 4 W., Jackson County, at bridge on County Trunk F, 0.1 mi above sewage-treatment plant, at Alma Center.

Drainage area.--6.16 mi^2. Tributary to.--Halls Creek.

Type of site.--Miscellaneous site.

Minimum discharge measured.--1 18 ft^3/s, Sept. 1, 1976.

Low-flow frequency.--$Q_{7,2}$ = 1.3 ft^3/s, $Q_{7,10}$ = 0.80 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 8 discharge measurements made during the period 1972-76.

Accuracy.--$SE_{7,2}$ = 22 percent, $SE_{7,10}$ = 31 percent.

05381285 Halls Creek at Merrillan, Wis.

Location.--SE¼NW¼ sec. 26, T. 23 N., R. 4 W., Jackson County, at sewage-treatment plant, 0.3 mi downstream from U.S. Highway 12 bridge, at Merrillan.

Drainage area.--46.3 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Minimum discharge measured.--16.7 ft^3/s, July 31, 1974.

Low-flow frequency.--$Q_{7,2}$ = 12 ft^3/s, $Q_{7,10}$ = 8.4 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 8 discharge measurements made during the period 1972-76.

Accuracy.--$SE_{7,2}$ = 14 percent, $SE_{7,10}$ = 18 percent.

05381290 Halls Creek near Black River Falls, Wis.

Location.--SW¼ SE¼ sec. 19, T. 22 N., R. 3 W., Jackson County, at bridge on County Trunk E, 5.7 mi northeast of Black River Falls.

Drainage area.--90.9 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 10, 1970, 20.4 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 19 ft^3/s, $Q_{7,10}$ = 14 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05381350 Levis Creek near Black River Falls, Wis.

Location.--NE¼SE¼ sec. 12, T. 21 N., R. 4 W., Jackson County, at bridge on State Highway 54, 2.2 mi northeast of Black River Falls.

Drainage area.--39.7 mi^2. Tributary to.--Black River.

Type of site.--Low-flow partial-record station.

Minimum discharge measured.--5.03 ft^3/s, Aug. 17, 1964.

Low-flow frequency.--$Q_{7,2}$ = 7.0 ft^3/s, $Q_{7,10}$ = 4.4 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 15 discharge measurements made during the period 1964-76.

Accuracy.--$SE_{7,2}$ = 9 percent, $SE_{7,10}$ = 15 percent.

Table 1.--Low-flow characteristics for sites in the Trempealeau-Black River basin--Continued

05381400 Robinson Creek near Black River Falls, Wis.

Location.--SW¼NE¼ sec. 22, T. 20 N., R. 4 W., Jackson County, at State Highway 27, 6.7 mi south of Black River Falls.

Drainage area.--108 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 12, 1970, 45.5 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 35 ft^3/s, $Q_{7,10}$ = 27 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05381420 Trout Run near Melrose, Wis.

Location.--SW¼SW¼ sec. 13, T. 20 N., R. 5 W., Jackson County, at bridge on country road, 6.0 mi northeast of Melrose.

Drainage area.--23.7 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 12, 1970, 8.88 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 6.8 ft^3/s, $Q_{7,10}$ = 4.8 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05381450 Big Creek near Cataract, Wis.

Location.--NE¼SW¼ sec. 7, T. 19 N., R. 4 W., Monroe County, at country road, 4.6 mi northwest of Cataract.

Drainage area.--64.0 mi^2. Tributary to.--Black River.

Type of site.--Low-flow partial-record station.

Minimum discharge measured.--32.5 ft^3/s, Aug. 17, 1964.

Low-flow frequency.--$Q_{7,2}$ = 33 ft^3/s, $Q_{7,10}$ = 24 ft^3/s.

Basis of estimate.--Correlated with LaCrosse River near West Salem using 10 discharge measurements made during the period 1964-76.

Accuracy.--$SE_{7,2}$ = 5 percent, $SE_{7,10}$ = 10 percent.

05381495 Douglas Creek at Melrose, Wis.

Location.--SW¼SW¼ sec. 9, T. 19 N., R. 5 W., Jackson County, at bridge on County Trunk E, just upstream from sewage-treatment plant, at Melrose.

Drainage area.--22.9 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Minimum discharge measured.--9.01 ft^3/s, Aug. 12, 1970.

Low-flow frequency.--$Q_{7,2}$ = 7.8 ft^3/s, $Q_{7,10}$ = 5.6 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 8 discharge measurements made during the period 1970-76.

Accuracy.--$SE_{7,2}$ = 11 percent, $SE_{7,10}$ = 17 percent.

Table 1.--Low-flow characteristics for sites in the Trempealeau-Black River basin--Continued

05381500 Black River at Melrose, Wis.

Location.--SE¼NE¼ sec. 20, T. 19 N., R. 5 W., Jackson County, at State Highway 71, 1.6 mi south of Melrose.

Drainage area.-- Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurements.--Jan. 15, 1903, 598 ft^3/s; Feb. 7, 1903, 508 ft^3/s; June 13, 1903, 842 ft^3/s.

Low-flow frequency.--Unable to define relationship, additional discharge measurements are required.

05381800 Fleming Creek at Stevenstown, Wis.

Location.--SW¼NW¼ sec. 13, T. 18 N., R. 7 W., La Crosse County, at County Trunk T, in Stevenstown.

Drainage area.--28.5 mi^2. Tributary to.--Black River.

Type of site.--Low-flow partial-record station.

Minimum discharge measured.--8.13 ft^3/s, July 12, 1967.

Low-flow frequency.--$Q_{7,2}$ = 7.3 ft^3/s, $Q_{7,10}$ = 5.1 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 9 discharge measurements made during the period 1967-76.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 31 percent.

05381810 Sour Creek at Stevenstown, Wis.

Location.--NW¼NE¼ sec. 14, T. 18 N., R. 7 W., La Crosse County, at bridge on County Trunk T, 0.4 mi northwest of Stevenstown.

Drainage area.--5.76 mi^2. Tributary to.--Fleming Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Sept. 8, 1966, 1.01 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 1.0 ft^3/s, $Q_{7,10}$ = 0.62 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05382000 Black River near Galesville, Wis.

Location.--NE¼SE¼ sec. 2, T. 18 N., R. 8 W., La Crosse County, at U.S. Highway 53, 3.2 mi southeast of Galesville.

Drainage area.--2,120 mi^2. Tributary to.--Mississippi River.

Type of site.--Gaging station.

Period of record.--December 1931 to September 1976.

Average discharge.--44 years, 1,683 ft^3/s.

Extremes.--Maximum discharge, 65,500 ft^3/s Apr. 1, 1967; minimum discharge, 180 ft^3/s Dec. 20, 1932.

Period of consecutive days	Magnitude and frequency of annual low flow. Discharge, in cubic feet per second, for indicated recurrence interval, in years					
	2	5	10	20	50	100
7	344	284	259	241	223	213
14	355	293	268	251	234	224
30	380	313	287	270	253	244
60	433	340	305	281	258	246
90	496	372	325	293	262	246

Duration table of daily flow. Discharge, in cubic feet per second, which was exceeded for indicated percent of time						
Percent	2	5	10	20	30	40
ft^3/s	10,000	5,950	3,650	2,080	1,400	1,000
Percent	50	60	70	80	90	95
ft^3/s	770	625	520	430	365	326
Percent	98	99.9				
ft^3/s	290	225				

Accuracy.--$SE_{7,2}$ = 4 percent, $SE_{7,10}$ = 5 percent.

Remarks.--Flow partially regulated by Hatfield dam powerplant. Water is diverted periodically from basin into Lemonweir River basin for cranberry culture.

05382010 Beaver Creek near Taylor, Wis.

Location.--NW¼SW¼ sec. 10, T. 20 N., R. 6 W., Jackson County, at culvert on County Trunk C, 7.1 mi south of Taylor.

Drainage area.-- Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 18, 1970, 1.22 ft^3/s; Aug. 19, 1975, 1.56 ft^3/s.

05382015 Beaver Creek near Taylor, Wis.

Location.--NW¼NE¼ sec. 17, T. 20 N., R. 6 W., Jackson County, at bridge on country road, 7.4 mi south of Taylor.

Drainage area.-- Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 18, 1970, 3.30 ft^3/s; Aug. 19, 1975, 4.14 ft^3/s.

05382018 Beaver Creek tributary near Ettrick, Wis.

Location.--SE¼NE¼ sec. 18, T. 20 N., R. 6 W., Jackson County, at culvert on County Trunk C, 7.0 mi northeast of Ettrick.

Drainage area.-- Tributary to.--Beaver Creek.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 19, 1970, 0.39 ft^3/s; Aug. 19, 1975, 0.67 ft^3/s.

05382022 Beaver Creek near Ettrick, Wis.

Location.--NE¼NE¼ sec. 13, T. 20 N., R. 7 W., Trempealeau County, at bridge on country road, 6.2 mi northeast of Ettrick.

Drainage area.-- Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 20, 1970, 4.43 ft^3/s; Aug. 19, 1975, 7.37 ft^3/s.

05382025 Beaver Creek tributary near Ettrick, Wis.

Location.--NE¼NE¼ sec. 13, T. 20 N., R. 7 W., Trempealeau County, at culvert on country road, 6.3 mi northeast of Ettrick.

Drainage area.-- Tributary to.--Beaver Creek.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 20, 1970, 0.48 ft^3/s; Aug. 19, 1975, 0.86 ft^3/s.

05382027 Beaver Creek near Ettrick, Wis.

Location.--SE¼NE¼ sec. 14, T. 20 N., R. 7 W., Trempealeau County, at bridge on country road, 5.3 mi northeast of Ettrick.

Drainage area.-- Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 20, 1970, 5.61 ft^3/s; Aug. 19, 1975, 7.81 ft^3/s.

05382032 Washington Coulee near Ettrick, Wis.

Location.--SW¼NE¼ sec. 14, T. 20 N., R. 7 W., Trempealeau County, at bridge on County Trunk C, 5.2 mi northeast of Ettrick.

Drainage area.-- Tributary to.--Beaver Creek.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 20, 1970, 0.92 ft^3/s; Aug. 19, 1975, 1.50 ft^3/s.

05382037 Beaver Creek near Ettrick, Wis.

Location.--NW¼NW¼ sec. 15, T. 20 N., R. 7 W., Trempealeau County, at bridge on country road, 4.0 mi northeast of Ettrick.

Drainage area.-- Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 20, 1970, 9.16 ft^3/s; Aug. 19, 1975, 13.6 ft^3/s.

05382040 Beaver Creek near Ettrick, Wis.

Location.--SE¼SE¼ sec. 17, T. 20 N., R. 7 W., Trempealeau County, at bridge on U.S. Highway 53, 2.8 mi northeast of Ettrick.

Drainage area.-- Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 20, 1970, 10.1 ft^3/s; Aug. 19, 1975, 15.0 ft^3/s.

Table 1.--Low-flow characteristics for sites in the Trempealeau-Black River basin--Continued

05382044 Bear Creek near Ettrick, Wis.

Location.--SW¼NE¼ sec. 8, T. 20 N., R. 7 W., Trempealeau County, at bridge on country road, 4.0 mi north of Ettrick.

Drainage area.-- Tributary to.--Beaver Creek.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 20, 1970, 1.06 ft^3/s; Aug. 19, 1975, 1.80 ft^3/s.

05382048 Bear Creek tributary near Ettrick, Wis.

Location.--NE¼SE¼ sec. 8, T. 20 N., R. 7 W., Trempealeau County, at culvert on U.S. Highway 53, 3.7 mi north of Ettrick.

Drainage area.-- Tributary to.--Bear Creek.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 20, 1970, 0.52 ft^3/s; Aug. 19, 1975, 1.18 ft^3/s.

05382051 Bear Creek near Ettrick, Wis.

Location.--SW¼NE¼ sec. 17, T. 20 N., R. 7 W., Trempealeau County, at bridge on farm road, 3.2 mi northeast of Ettrick.

Drainage area.-- Tributary to.--Beaver Creek.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 20, 1970, 2.18 ft^3/s; Aug. 19, 1975, 3.78 ft^3/s.

05382060 Beaver Creek at Ettrick, Wis.

Location.--SW¼NW¼ sec. 31, T. 20 N., R. 7 W., Trempealeau County, at bridge on County Trunk C, 0.3 mi upstream from confluence with South Fork Beaver Creek, at Ettrick.

Drainage area.--51.0 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Minimum discharge measured.--17.4 ft^3/s, Aug. 10, 1974.

Low-flow frequency.--$Q_{7,2}$ = 14 ft^3/s, $Q_{7,10}$ = 9.2 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 8 discharge measurements made during the period 1970-76.

Accuracy.--$SE_{7,2}$ = 9 percent, $SE_{7,10}$ = 10 percent.

05382065 South Fork Beaver Creek tributary near North Bend, Wis.

Location.--SW¼SW¼ sec. 4, T. 19 N., R. 6 W., Jackson County, at bridge on country road, 3.8 mi north of North Bend.

Drainage area.-- Tributary to.--South Fork Beaver Creek.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 18, 1970, 0.1 ft^3/s; Aug. 18, 1975, 0.06 ft^3/s.

05382067 South Fork Beaver Creek near North Bend, Wis.

Location.--SE¼SW¼ sec. 5, T. 19 N., R. 6 W., Jackson County, at bridge on country road, 3.7 mi north of North Bend.

Drainage area.-- Tributary to.--Beaver Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 18, 1970, 0.00 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0 ft^3/s, $Q_{7,10}$ = 0 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--Not applicable.

05382071 German Coulee near North Bend, Wis.

Location.--SW¼NE¼ sec. 32, T. 20 N., R. 6 W., Jackson County, at bridge on country road, 5.1 mi north of North Bend.

Drainage area.-- Tributary to.--South Fork Beaver Creek.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 18, 1970, 0.30 ft^3/s; Aug. 18, 1975, 0.49 ft^3/s.

05382072 German Coulee near North Bend, Wis.

Location.--NE¼SW¼ sec. 5, T. 19 N., R. 6 W., Jackson County, at bridge on country road, 4.1 mi north of North Bend.

Drainage area.-- Tributary to.--South Fork Beaver Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 18, 1970, 0.00 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0 ft^3/s, $Q_{7,10}$ = 0 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--Not applicable.

05382076 South Fork Beaver Creek near North Bend, Wis.

Location.--SE¼NE¼ sec. 12, T. 19 N., R. 7 W., Trempealeau County, at bridge on farm road, 3.7 mi northwest of North Bend.

Drainage area.-- Tributary to.--Beaver Creek.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 18, 1970, 1.50 ft^3/s; Aug. 18, 1975, 2.13 ft^3/s.

05382080 South Fork Beaver Creek near North Bend, Wis.

Location.--NE¼NE¼ sec. 11, T. 19 N., R. 7 W., Trempealeau County, at bridge on country road, 4.7 mi northwest of North Bend.

Drainage area.-- Tributary to.--Beaver Creek.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 17, 1970, 1.71 ft^3/s; Aug. 18, 1975, 2.55 ft^3/s.

05382087 Salzwedel Coulee near Ettrick, Wis.

Location.--SW¼NW¼ sec. 3, T. 19 N., R. 7 W., Trempealeau County, at bridge on country road, 3.1 mi east of Ettrick.

Drainage area.-- Tributary to.--South Fork Beaver Creek.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 17, 1970, 1.30 ft^3/s; Aug. 18, 1975, 1.38 ft^3/s.

05382089 South Fork Beaver Creek tributary near Ettrick, Wis.

Location.--NE¼SW¼ sec. 4, T. 19 N., R. 7 W., Trempealeau County, at bridge on County Trunk D, 2.6 mi southeast of Ettrick.

Drainage area.-- Tributary to.--South Fork Beaver Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 18, 1975, 0.006 ft^3/s.

05382093 South Fork Beaver Creek near Ettrick, Wis.

Location.--NE¼NE¼ sec. 5, T. 19 N., R. 7 W., Trempealeau County, at bridge on country road, 1.8 mi southeast of Ettrick.

Drainage area.-- Tributary to.--Beaver Creek.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 18, 1970, 5.24 ft^3/s; Aug. 18, 1975, 6.46 ft^3/s.

05382098 Stensven Coulee near Ettrick, Wis.

Location.--SE¼SE¼ sec. 31, T. 20 N., R. 7 W., Trempealeau County, at bridge on County Trunk D, 1.0 mi southeast of Ettrick.

Drainage area.-- Tributary to.--South Fork Beaver Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 18, 1975, 0.18 ft^3/s.

05382100 South Fork Beaver Creek at Ettrick, Wis.

Location.--SE¼NW¼ sec. 31, T. 20 N., R. 7 W., Trempealeau County, at bridge on County Trunk D, 0.3 mi upstream from Beaver Creek, 0.2 mi south of Ettrick.

Drainage area.--33.1 mi^2. Tributary to.--Beaver Creek.

Type of site.--Low-flow partial-record station.

Minimum discharge measured.--4.22 ft^3/s, Aug. 19, 1964.

Low-flow frequency.--$Q_{7,2}$ = 6.1 ft^3/s, $Q_{7,10}$ = 4.4 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 11 discharge measurements made during the period 1964-70.

Accuracy.--$SE_{7,2}$ = 6 percent, $SE_{7,10}$ = 11 percent.

Table 1.--Low-flow characteristics for sites in the Trempealeau-Black River basin--Continued

05382120 Beaver Creek near Ettrick, Wis.

Location.--NE¼SW¼ sec. 3, T. 19 N., R. 8 W., Trempealeau County, at bridge on State Highway 53, 3.1 mi southwest of Ettrick.

Drainage area.--98.5 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 20, 1970, 26.6 ft^3/s; Aug. 19, 1975, 41.4 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 28 ft^3/s, $Q_{7,10}$ = 21 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 22 percent, $SE_{7,10}$ = 16 percent.

05382130 French Creek near Ettrick, Wis.

Location.--SE¼NW¼ sec. 10, T. 20 N., R. 8 W., Trempealeau County, at bridge on country road, 4.7 mi northwest of Ettrick.

Drainage area.--2.04 mi^2. Tributary to.--Beaver Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 20, 1970, 0.92 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.67 ft^3/s, $Q_{7,10}$ = 0.42 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05382150 French Creek near Ettrick, Wis.

Location.--SE¼NE¼ sec. 15, T. 20 N., R. 8 W., Trempealeau County, 3.6 mi northwest of Ettrick.

Drainage area.--7.54 mi^2. Tributary to.--Beaver Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 20, 1970, 2.72 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 2.2 ft^3/s, $Q_{7,10}$ = 1.4 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05382160 French Creek tributary near Ettrick, Wis.

Location.--SE¼NE¼ sec. 15, T. 20 N., R. 8 W., Trempealeau County, at culverts on County Trunks D and T, 3.6 mi northwest of Ettrick.

Drainage area.--1.82 mi^2. Tributary to.--French Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 20, 1970, 0.49 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.41 ft^3/s, $Q_{7,10}$ = 0.25 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05382180 French Creek tributary near Ettrick, Wis.

Location.--NE¼SW¼ sec. 23, T. 20 N., R. 8 W., Trempealeau County, at bridge on County Trunk I, 2.4 mi northwest of Ettrick.

Drainage area.--2.22 mi^2. Tributary to.--French Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 20, 1970, 0.26 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.28 ft^3/s, $Q_{7,10}$ = 0.15 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05382200 French Creek near Ettrick, Wis.

Location.--NE¼NE¼ sec. 27, T. 20 N., R. 8 W., Trempealeau County, at County Trunks D and T, 2.5 mi northwest of Ettrick.

Drainage area.--14.5 mi^2. Tributary to.--Beaver Creek.

Type of site.--Low-flow partial-record station.

Minimum discharge measured.--2.18 ft^3/s, Aug. 19, 1964.

Low-flow frequency.--$Q_{7,2}$ = 3.7 ft^3/s, $Q_{7,10}$ = 2.3 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 23 discharge measurements made during the period 1961-70.

Accuracy.--$SE_{7,2}$ = 5 percent, $SE_{7,10}$ = 7 percent.

05382202 French Creek near Ettrick, Wis.

Location.--SW¼SE¼ sec. 27, T. 20 N., R. 8 W., Trempealeau County, at bridge on country road, 2.6 mi west of Ettrick.

Drainage area.--15.9 mi^2. Tributary to.--Beaver Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 20, 1970, 4.97 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 4.2 ft^3/s, $Q_{7,10}$ = 2.9 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05382204 French Creek tributary near Ettrick, Wis.

Location.--SW¼SE¼ sec. 27, T. 20 N., R. 8 W., Trempealeau County, at bridge on country road, 2.7 mi west of Ettrick.

Drainage area.--2.42 mi^2. Tributary to.--French Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 20, 1970, 0.45 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.43 ft^3/s, $Q_{7,10}$ = 0.25 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05382206 French Creek near Ettrick, Wis.

Location.--NE¼SW¼ sec. 3, T. 19 N., R. 8 W., Trempealeau County, at bridge on County Trunk T, 3.1 mi southwest of Ettrick.

Drainage area.--21.9 mi^2. Tributary to.--Beaver Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 20, 1970, 6.44 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 5.6 ft^3/s, $Q_{7,10}$ = 3.9 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05382209 Beaver Creek near Galesville, Wis.

Location.--NW¼SE¼ sec. 16, T. 19 N., R. 8 W., Trempealeau County, at U.S. Highway 53, 2.5 mi northeast of Galesville.

Drainage area.--124 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 11, 1970, 39.0 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 33 ft^3/s, $Q_{7,10}$ = 25 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05382211 Beaver Creek at Galesville, Wis.

Location.--SW¼NE¼ sec. 32, T. 19 N., R. 8 W., Trempealeau County, at sewage-treatment plant, about 0.4 mi upstream from State Highway 54 bridge, at Galesville.

Drainage area.--147 mi^2. Tributary to.--Black River.

Type of site.--Miscellaneous site.

Minimum discharge measured.--53.0 ft^3/s, Sept. 2, 1976.

Low-flow frequency.--$Q_{7,2}$ = 41 ft^3/s, $Q_{7,10}$ = 29 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 8 discharge measurements made during the period 1972-76.

Accuracy.--$SE_{7,2}$ = 13 percent, $SE_{7,10}$ = 15 percent.

05382237 Halfway Creek at Holmen, Wis.

Location.--NW¼SE¼ sec. 7, T. 17 N., R. 7 W., La Crosse County, at sewage-treatment plant, 0.4 mi downstream from County Trunk DH, in Holmen.

Drainage area.--31.1 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Minimum discharge measured.--7.31 ft^3/s, Aug. 9, 1973.

Low-flow frequency.--$Q_{7,2}$ = 5.1 ft^3/s, $Q_{7,10}$ = 3.1 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 9 discharge measurements made during the period 1972-77.

Accuracy.--$SE_{7,2}$ = 21 percent, $SE_{7,10}$ = 33 percent.

05382240 Halfway Creek at Midway, Wis.

Location.--SE¼SE¼ sec. 24, T. 17 N., R. 8 W., La Crosse County, at culvert on County Trunk ZN, 0.7 mi west of Midway.

Drainage area.--34.5 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 12, 1970, 5.89 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 5.8 ft^3/s, $Q_{7,10}$ = 3.8 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 18 percent.

05382265 La Crosse River near Angelo, Wis.

Location.--SE¼NE¼ sec. 27, T. 18 N., R. 3 W., Monroe County, at country road, 3.7 mi northeast of Angelo.

Drainage area.--59.7 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 13, 1970, 58.3 ft^3/s; Aug. 10, 1972, 60.5 ft^3/s; June 27, 1973, 103 ft^3/s; Sept. 11, 1973, 72 ft3/s; Aug. 19, 1976, 46.2 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 41 ft^3/s, $Q_{7,10}$ = 31 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 5 discharge measurements.

Accuracy.--$SE_{7,10}$ = 19 percent (basin average).

05382280 Silver Creek near Sparta, Wis.

Location.--NE¼NW¼ sec. 24, T. 17 N., R. 3 W., Monroe County, at U.S. Highway 16, 6.5 mi east of Sparta.

Drainage area.--14.7 mi^2. Tributary to.--La Crosse River.

Type of site.--Low-flow partial-record station.

Minimum discharge measured.--5.77 ft^3/s, Aug. 17, 1964.

Low-flow frequency.--$Q_{7,2}$ = 6.6 ft^3/s, $Q_{7,10}$ = 5.6 ft^3/s.

Basis of estimate.--Correlated with Little La Crosse River near Leon using 10 discharge measurements made during the period 1964-77.

Accuracy.--$SE_{7,2}$ = 4 percent, $SE_{7,10}$ = 7 percent.

05382330 La Crosse River at Sparta, Wis.

Location.--NE¼SE¼ sec. 23, T. 17 N., R. 4 W., Monroe County, upstream from sewage-treatment plant, at Sparta.

Drainage area.--168 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurements.--June 27, 1973, 223 ft^3/s; Sept. 11, 1973, 178 ft^3/s; Aug. 18, 1976, 104 ft^3/s; Aug. 8, 1977, 104 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 84 ft^3/s, $Q_{7,10}$ = 63 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 4 discharge measurements.

Accuracy.--$SE_{7,10}$ = 19 percent (basin average).

05382380 Little La Crosse River at Cashton, Wis.

Location.--NW¼NE¼ sec. 24, T. 15 N., R. 4 W., Monroe County, at bridge on State Highway 27, 1.8 mi northwest of Cashton.

Drainage area.--3.05 mi^3. Tributary to.--La Crosse River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 10, 1972, 0.78 ft^3/s; June 28, 1973, 2.03 ft^3/s; Sept. 11, 1973, 2.22 ft^3/s; Aug. 18, 1976, 0.92 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.53 ft^3/s, $Q_{7,10}$ = 0.38 ft^3/s.

Basis of estimate.--Correlated with Kickapoo River at La Farge using 4 discharge measurements.

Accuracy.--$SE_{7,10}$ = 19 percent (basin average).

05382410 Little La Crosse River at Melvina, Wis.

Location.--SE¼NE¼ sec. 6, T. 15 N., R. 3 W., Monroe County, at bridge on County Trunk F, at Melvina.

Drainage area.--18.4 mi^2. Tributary to.--La Crosse River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 10, 1972, 6.37 ft^3/s; June 28, 1973, 12.3 ft^3/s; Sept. 11, 1973, 12.7 ft^3/s; Aug. 18, 1976, 4.80 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 3.7 ft^3/s, $Q_{7,10}$ = 2.7 ft^3/s.

Basis of estimate.--Correlated with Kickapoo River at La Farge using 4 discharge measurements.

Accuracy.--$SE_{7,10}$ = 19 percent (basin average).

05382500 Little La Crosse River near Leon, Wis.

Location.--NE¼NW¼ sec. 3, T. 16 N., R. 4 W., Monroe County, at town road, 1.5 mi northwest of Leon.

Drainage area.--77.1 mi^2. Tributary to.--La Crosse River.

Type of site.--Gaging station and low-flow partial-record station.

Period of record.--March 1934 to September 1961.

Average discharge.--27 years, 46.3 ft^3/s.

Extremes.--Maximum discharge, 4,620 ft^3/s Aug. 6, 1935; minimum daily, 18 ft^3/s June 2 and 3, 1934.

Period of consecutive days	Magnitude and frequency of annual low flow. Discharge, in cubic feet per second, for indicated recurrence interval, in years					
	2	5	10	20	50	100
7	27	23	22	20	19	18
14	28	24	22	21	19	18
30	29	25	23	22	20	19
60	31	27	25	23	22	20
90	33	28	26	25	23	22

Accuracy.--$SE_{7,2}$ = 3 percent, $SE_{7,10}$ = 5 percent.

Duration table of daily flow. Discharge, in cubic feet per second, which was exceeded for indicated percent of time							
Percent	2	5	10	20	30	40	50
ft^3/s	155	84	62	48	43	40	38
Percent	60	70	80	90	95	98	99.9
ft^3/s	36	33	31	28	26	24	21

Table 1.--Low-flow characteristics for sites in the Trempealeau-Black River basin--Continued

05382560 La Crosse River at Rockland, Wis.

Location.--NW¼NE¼ sec. 36, T. 17 N., R. 5 W., La Crosse County, County Trunk J, 0.5 mi north of Rockland.

Drainage area.--285 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 13, 1970, 178 ft^3/s; Aug. 10, 1972, 195 ft^3/s; June 26, 1973, 338 ft^3/s; Sept. 11, 1973, 236 ft^3/s; Aug. 18, 1976, 167 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 120 ft^3/s, $Q_{7,10}$ = 87 ft^3/s.

Basis of estimate.--Correlated with Trempealeau River at Dodge using 5 discharge measurements.

Accuracy.--$SE_{7,10}$ = 19 percent (basin average).

05382590 Dutch Creek at Bangor, Wis.

Location.--SW¼NE¼ sec. 8, T. 16 N., R. 5 W., La Crosse River, County Trunk JB, 1.0 mi southwest of Bangor.

Drainage area.--17.0 mi^2. Tributary to.--La Crosse River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 12, 1970, 9.16 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 7.1 ft^3/s, $Q_{7,10}$ = 5.3 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05382610 La Crosse River at Bangor, Wi.

Location.--SE¼SE¼ sec. 32, T. 17 N., R. 5 W., La Crosse County, just downstream from Dutch Creek, 0.6 mi north of Bangor.

Drainage area.--332 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 18, 1976, 192 ft^3/s; Aug. 8, 1977, 191 ft^3/s; Sept. 13, 1977, 172 ft^3/s; Sept. 11, 1978, 210 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 140 ft^3/s, $Q_{7,10}$ = 100 ft^3/s.

Basis of estimate.--Correlated with La Crosse River near West Salem using 4 discharge measurements.

Accuracy.--$SE_{7,10}$ = 19 percent (basin average).

05383000 La Crosse River near West Salem, Wis.

Location.--SW¼SE¼ sec. 32, T. 17 N., R. 6 W., La Crosse County, at town road, 1.9 mi west of West Salem.

Drainage area.--398 mi^2. Tributary to.--Mississippi River.

Type of site.--Gaging station.

Period of record.--December 1913 to September 1970.

Average discharge.--56 years, 288 ft^3/s.

Extremes.--Maximum discharge, 8,200 ft^3/s Aug. 6, 1935; minimum discharge, 30 ft^3/s Sept. 5, 1948.

Period of consecutive days	Magnitude and frequency of annual low flow. Discharge, in cubic feet per second, for indicated recurrence interval, in years					
	2	5	10	20	50	100
7	160	131	116	104	92	83
14	166	141	130	121	111	105
30	178	156	145	137	129	124
60	192	169	158	150	141	136
90	203	178	166	156	148	140

Duration table of daily flow. Discharge, in cubic feet per second, which was exceeded for indicated percent of time							
Percent	2	5	10	20	30	40	50
ft^3/s	845	560	410	323	290	267	248
Percent	60	70	80	90	95	98	99.9
ft^3/s	229	210	190	172	159	140	85

Accuracy.--$SE_{7,2}$ = 3 percent, $SE_{7,10}$ = 5 percent.

Remarks.--Occasional fluctuation caused by powerplant upstream.

05383029 St. Joseph Coulee tributary at St. Joseph, Wis.

Location.--NW¼NE¼ sec. 12, T. 15 N., R. 6 W., La Crosse County, at bridge on private road, 0.8 mi north of St. Joseph.

Drainage area.--0.49 mi^2. Tributary to.--St. Joseph Coulee.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 18, 1976, 0.39 ft^3/s; Aug. 9, 1977, 0.28 ft^3/s; Sept. 13, 1977, 0.36 ft^3/s; Sept. 11, 1978, 0.45 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.17 ft^3/s, $Q_{7,10}$ = 0.13 ft^3/s.

Basis of estimate.--Correlated with Coon Creek at Coon Valley using 4 discharge measurements.

Accuracy.--$SE_{7,10}$ = 19 percent (basin average).

05383050 Bostwick Creek near Barre Mills, Wis.

Location.--SW¼NW¼ sec. 17, T. 16 N., R. 6 W., La Crosse County, at bridge on County Trunk B, 1.7 mi northwest of Barre Mills.

Drainage area.--41.5 mi^2. Tributary to.--La Crosse River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 12, 1970, 14.5 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 13 ft^3/s, $Q_{7,10}$ = 9.7 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05386300 Mormon Creek near La Crosse, Wis.

Location.--NE¼NW¼ sec. 19, T. 15 N., R. 6 W., La Crosse County, at bridge on country road, 6.4 mi southeast of downtown La Crosse.

Drainage area.--25.5 mi^2. Tributary to.--Mississippi River.

Type of site.--Low-flow partial-record station.

Minimum discharge measured.--8.85 ft^3/s, Oct. 20, 1964.

Low-flow frequency.--$Q_{7,2}$ = 9.6 ft^3/s, $Q_{7,10}$ = 8.4 ft^3/s.

Basis of estimate.--Correlated with Little La Crosse River near Leon using 25 discharge measurements made during the period 1961-70.

Accuracy.--$SE_{7,2}$ = 6 percent, $SE_{7,10}$ = 7 percent.

05386500 Coon Creek at Coon Valley, Wis.

Location.--SW¼NE¼ sec. 7, T. 14 N., R. 5 W., Vernon County, 700 ft upstream from U.S. Highways 14 and 61, at Coon Valley.

Drainage area.--78.6 mi^2. Tributary to.--Mississippi River.

Type of site.--Gaging station.

Period of record.--April 1934 to September 1940.

Average discharge.--6 years, 41 ft^3/s.

Extremes.--Maximum discharge, 8,110 ft^3/s Aug. 6, 1935; minimum daily discharge, 21 ft^3/s Aug. 26, 1934.

Period of consecutive days	Magnitude and frequency of annual low flow Discharge, in cubic feet per second, for indicated recurrence interval, in years			
	2	5	10	20
7	28	25	24	23
14	29	26	25	23
30	30	27	25	24
60	32	28	27	25
90	33	30	28	26

Accuracy.--$SE_{7,2}$ = 2 percent, $SE_{7,10}$ = 3 percent.

Remarks.--The frequency analyses for the 7-, 14-, 30-, 60-, and 90-day low flows are based on the extension of records with 05382500 Little La Crosse River near Leon (1935-61 CY). All correlation coefficients are greater than 0.97.

05386850 Coon Creek at Chaseburg, Wis.

Location.--NW¼SW¼ sec. 27, T. 14 N., R. 6 W., Vernon County, at bridge on County Trunk KK, 0.4 mi east of Chaseburg.

Drainage area.--105 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 17, 1976, 61.1 ft^3/s; Aug. 9, 1977, 59.7 ft^3/s; Sept. 13, 1977, 54.5 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 39 ft^3/s, $Q_{7,10}$ = 34 ft^3/s.

Basis of estimate.--Correlated with Coon Creek at Coon Valley using 3 discharge measurements.

Accuracy.--$SE_{7,10}$ = 19 percent (basin average).

05386890 Coon Creek tributary at Chaseburg, Wis.

Location.--NW¼NE¼ sec. 33, T. 14 N., R. 6 W., Vernon County, 0.3 mi upstream from mouth, at Chaseburg.

Drainage area.--1.35 mi^2. Tributary to.--Coon Creek.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 17, 1976, 0 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0 ft^3/s, $Q_{7,10}$ = 0 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--Not applicable.

05387000 Coon Creek near Stoddard, Wis.

Location.--NE¼NE¼ sec. 25, T. 14 N., R. 7 W., Vernon County, 0.5 mi upstream from Wing Hollow Creek, 3.3 mi east of Stoddard.

Drainage area.--119 mi^2. Tributary to.--Mississippi River.

Type of site.--Gaging station.

Period of record.--April 1934 to September 1940.

Average discharge.--6 years, 68.2 ft^3/s.

Extremes.--Maximum discharge, 5,160 ft^3/s Aug. 6, 1935; minimum daily discharge, 31 ft^3/s Dec 23, 1937.

Period of consecutive days	Magnitude and frequency of annual low flow. Discharge, in cubic feet per second, for indicated recurrence interval, in years			
	2	5	10	20
7	45	42	40	39
14	47	43	41	39
30	50	45	42	40
60	53	47	44	42
90	55	49	46	44

Accuracy.--$SE_{7,2}$ = 2 percent, $SE_{7,10}$ = 3 percent.

Remarks.--Slight diurnal fluctuation caused by grist mill 4 mi upstream from station. The frequency analyses for the 7-, 14-, 30-, 60-, and 90-day low flows are based on extension of records with 05382900 Little La Crosse River near Leon (1935-61 CY). All correlation coefficients are greater than 0.96.

05387005 Coon Creek near Stoddard, Wis.

Location.--SW¼SW¼ sec. 25, T. 14 N., R. 7 W., Vernon County, at country road, 2.7 mi east of Stoddard.

Drainage area.--125 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 11, 1970, 65.8 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 50 ft^3/s, $Q_{7,10}$ = 42 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

Table 1.--Low-flow characteristics for sites in the Trempealeau-Black River basin--Continued

05387072 North Fork Bad Axe River near Westby, Wis.

Location.--SW¼SW¼ sec. 29, T. 14 N., R. 4 W., Vernon County, at bridge on country road, 1.6 mi west of Westby.

Drainage area.--1.77 mi^2. Tributary to.--Bad Axe River.

Type of site.--Miscellaneous site.

Discharge measurements.--June 20, 1972, 0 ft^3/s; Sept. 11, 1973, 0 ft^3/s; Aug. 16, 1976, 0 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.00 ft^3/s, $Q_{7,10}$ = 0.00 ft^3/s.

Basis of estimate.--Correlated with Coon Creek at Coon Valley using 3 discharge measurements.

Accuracy.--Not applicable.

05387085 Springville Branch at Viroqua, Wis.

Location.--NW¼NE¼ sec. 31, T. 13 N., R. 4 W., at end of town road, 0.5 mi north of Viroqua.

Drainage area.--1.15 mi^2. Tributary to.--Bad Axe River.

Type of site.--Miscellaneous site.

Discharge measurements.--June 20, 1972, 0.64 ft^3/s; June 28, 1973, 0.71 ft^3/s; Sept. 13, 1973, 0.78 ft^3/s; Aug. 16, 1976, 0 52 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.47 ft^3/s, $Q_{7,10}$ = 0.28 ft^3/s.

Basis of estimate.--Correlated with Nederlo Creek near Gays Mills using 4 discharge measurements.

Accuracy.--$SE_{7,10}$ = 19 percent (basin average).

05387087 Springville Branch tributary near Viroqua, Wis.

Location.--NW¼NW¼ sec. 29, T. 13 N., R. 4 W., Vernon County, at sewage-treatment plant for Vernon County Home, 1.6 mi north of Viroqua.

Drainage area.--0.31 mi^2. Tributary to.--Springville Branch.

Type of site.--Miscellaneous site.

Discharge measurement.--June 20, 1972, 0 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0 ft^3/s, $Q_{7,10}$ = 0 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--Not applicable.

05387090 Springville Branch at Springville, Wis.

Location.--SW¼SE¼ sec. 23, T. 13 N., R. 5 W., Vernon County, at bridge on County Trunk B, in Springville.

Drainage area.--8.93 mi^2. Tributary to.--Bad Axe River.

Type of site.--Miscellaneous site.

Discharge measurements.--June 20, 1972, 2.57 ft^3/s; June 28, 1973, 6.02 ft^3/s; Sept. 13, 1973, 5.61 ft^3/s; June 29, 1976, 4.54 ft^3/s; Aug. 16, 1976, 3.91 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 2.6 ft^3/s, $Q_{7,10}$ = 1.1 ft^3/s.

Basis of estimate.--Correlated with Nederlo Creek near Gays Mills using 5 discharge measurements.

Accuracy.--$SE_{7,10}$ = 19 percent (basin average).

Table 1.--Low-flow characteristics for sites in the Trempealeau-Black River basin--Continued

05387100 North Fork Bad Axe River near Genoa, Wis.

Location.--SE¼SE¼ sec. 36, T. 13 N., R. 7 W., Vernon County, at bridge on State Highway 56, 4.1 mi southeast of Genoa.

Drainage area.--80.9 mi^2. Tributary to.--Mississippi River.

Type of site.--Low-flow partial-record station.

Minimum discharge measured.--22.9 ft^3/s, Aug. 11, 1964.

Low-flow frequency.--$Q_{7,2}$ = 25 ft^3/s, $Q_{7,10}$ = 19 ft^3/s.

Basis of estimate.--Correlated with Little La Crosse River near Leon using 12 discharge measurements made during the period 1961-76.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 17 percent.

05387130 South Fork Bad Axe River near Genoa, Wis.

Location.--SW¼NW¼ sec. 7, T. 12 N., R. 6 W., Vernon County, at country road, 5 mi southeast of Genoa.

Drainage area.--83.1 mi^2. Tributary to.--Bad Axe River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 11, 1970, 35.7 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 30 ft^3/s, $Q_{7,10}$ = 24 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05388370 Rush Creek near Ferryville, Wis.

Location.--SW¼NW¼ sec. 32, T. 11 N., R. 6 W., Crawford County, at bridge on country road, 3.0 mi northwest of Ferryville.

Drainage area.--44.8 mi^2. Tributary to.--Mississippi River.

Type of site.--Low-flow partial-record stations.

Minimum discharge measured.--13.8 ft^3/s, Sept. 6, 1967.

Low-flow frequency.--$Q_{7,2}$ = 13 ft^3/s, $Q_{7,10}$ = 8.4 ft^3/s.

Basis of estimate.--Correlated with Knapp Creek near Bloomingdale using 9 discharge measurements made during the period 1963-76.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 21 percent.

05388372 Sugar Creek near Rising Sun, Wis.

Location.--SW¼SE¼ sec. 32, T. 11 N., R. 5 W., Crawford County, 0.3 mi downstream from bridge on County Trunk C, 3.2 mi southwest of Rising Sun.

Drainage area.--7.81 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 12, 1969, 2.58 ft^3/s; Sept. 6, 1972, 3.30 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 2.4 ft^3/s, $Q_{7,10}$ = 1.6 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05388373 Sugar Creek tributary near Rising Sun, Wis.

Location.--NW¼NW¼ sec. 5, T. 10 N., R. 5 W., Crawford County, at mouth, 3.6 mi southwest of Rising Sun.

Drainage area.--2.40 mi^2. Tributary to.--Sugar Creek.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 12, 1969, 0.29 ft^3/s; Sept. 6, 1972, 0.17 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.22 ft^3/s, $Q_{7,10}$ = 0.11 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05388375 Sugar Creek at Ferryville, Wis.

Location.--NE¼SE¼ sec. 16, T. 10 N., R. 6 W., Crawford County, at bridge on State Highway 35, 1.2 mi southeast of Ferryville.

Drainage area.--24.6 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Minimum discharge measured.--8.40 ft^3/s, Aug. 11, 1970.

Low-flow frequency.--$Q_{7,2}$ = 8.4 ft^3/s, $Q_{7,10}$ = 7.2 ft^3/s.

Basis of estimate.--Correlated with Kickapoo River at La Farge using 6 discharge measurements made during the period 1970-76.

Accuracy.--$SE_{7,2}$ = 12 percent, $SE_{7,10}$ = 12 percent.

05388378 North Branch Copper Creek tributary near Mt. Sterling, Wis.

Location.--NW¼SW¼ sec. 22, T. 10 N., R. 5 W., Crawford County, 300 ft upstream from State Highway 171, 0.1 mi upstream from mouth, 1.6 mi northwest of Mt. Sterling.

Drainage area.--1.24 mi^2. Tributary to.--North Branch Copper Creek.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 12, 1969, 0.20 ft^3/s; Sept. 6, 1972, 0.50 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.21 ft^3/s, $Q_{7,10}$ = 0.11 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

05388379 Upper Copper Creek near Mt. Sterling, Wis.

Location.--SE¼NE¼ sec. 16, T. 10 N., R. 5 W., Crawford County, 1.5 mi upstream from bridge on State Highway 171, 2.6 mi northwest of Mt. Sterling.

Drainage area.--2.33 mi^2. Tributary to.--North Branch Copper Creek.

Type of site.--Miscellaneous site.

Discharge measurements.--Aug. 12, 1969, 0.49 ft^3/s; Sept. 6, 1972, 0.52 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 0.48 ft^3/s, $Q_{7,10}$ = 0.28 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

Table 1.--Low-flow characteristics for sites in the Trempealeau-Black River basin--Continued

05388380 Copper Creek near Mt. Sterling, Wis.

Location.--SW¼NW¼ sec. 29, T. 10 N., R. 5 W., Crawford County, at bridge on country road, 3.6 mi west of Mt. Sterling.

Drainage area.--14.1 mi^2. Tributary to.--Mississippi River.

Type of site.--Low-flow partial-record station.

Minimum discharge measured.--5.27 ft^3/s, Sept. 6, 1967.

Low-flow frequency.--$Q_{7,2}$ = 6.2 ft^3/s, $Q_{7,10}$ = 3.8 ft^3/s.

Basis of estimate.--Correlated with Nederlo Creek near Gays Mills using 7 discharge measurements made during the period 1963-77.

Accuracy.--$SE_{7,2}$ = 13 percent, $SE_{7,10}$ = 15 percent.

05388465 Du Charme Creek near Eastman, Wis.

Location.--NW¼SW¼ sec. 17, T. 8 N., R. 6 W., Crawford County, 1.0 mi upstream from mouth, 5.1 mi west of Eastman.

Drainage area.--12.5 mi^2. Tributary to.--Mississippi River.

Type of site.--Miscellaneous site.

Discharge measurement.--Aug. 11, 1970, 1.48 ft^3/s.

Low-flow frequency.--$Q_{7,2}$ = 1.7 ft^3/s, $Q_{7,10}$ = 1.0 ft^3/s.

Basis of estimate.--Used regression equations 6 and 8.

Accuracy.--$SE_{7,2}$ = 16 percent, $SE_{7,10}$ = 22 percent.

Table 2.--Basin characteristics for low-flow partial-record stations and selected gaging stations in the Trempealeau-Black River basin

Station number	Station name	Drainage area (mi^2) A	Main-channel slope (ft/mi) S	Main-channel length (mi) L	Basin storage (percent) Bs	Forest cover (percent) F
05378100	Little Waumandee Creek near Cream	46.0	22.3	17.1	0.00	42.4
05378200	Eagle Creek near Fountain City	26.8	40.9	11.3	.00	47.6
05379200	Trempealeau River at Taylor	110	8.6	18.6	.73	32.4
05379300	Elk Creek at Elk Creek	90.1	11.8	13.0	.31	12.9
05380820	Little Black River near Medford	58	7.79	18.8	15.5	44.8
05380870	Pine Creek near Medford	34.3	11.0	17.2	6.70	16.5
05380900	Poplar River near Owen	157	7.04	30.2	4.17	22.2
05380970	Cawley Creek near Neillsville	38.6	17.2	11.2	.08	20.3
05381150	East Fork Black River near Pittsville	37.2	9.0	14.7	4.60	46.2
05381170	Rock Creek near Neillsville	27.8	9.3	11.0	5.70	53.2
05381350	Levis Creek near Black River Falls	39.7	12.5	12.7	25.4	81.3
05381450	Big Creek near Cataract	64.0	19.5	12.8	.00	28.9
05381800	Fleming Creek at Stevenstown	28.5	57.7	8.07	.40	37.5
05382100	South Fork Beaver Creek at Ettrick	33.1	14.5	13.4	1.00	27.5
05382200	French Creek near Ettrick	14.5	33.8	5.70	.00	26.6
05382280	Silver Creek near Sparta	14.7	44.9	6.70	.81	52.1
05382500	Little La Crosse River near Leon	77.1	20.0	15.8	2.65	30.4
05386300	Mormon Creek near La Crosse	25.5	47.5	9.6	.00	36.0
05386500	Coon Creek at Coon Valley	78.6	34.7	23.8	.00	33.9
05387000	Coon Creek near Stoddard	119	15.6	13.3	.02	38.0
05387100	North Fork Bad Axe River near Genoa	80.9	27.3	22.5	.00	28.0
05388370	Rush River near Ferryville	44.8	27.9	14.0	.10	19.8
05388380	Copper Creek near Mount Sterling	14.1	66.5	5.30	.00	34.9

Table 2.--Basin characteristics for low-flow partial-record stations and selected gaging stations in the Trempealeau-Black River basin

Mean annual precipitation (in) P	Soil infiltration rate (in/hr) I	Mean annual snowfall (in) Sn	Base-flow index $(ft^3/s)/mi^2$ Bf	Hydraulic conductivity $(gal/d)/ft^2$ K	Drift thickness (ft) H	Transmissivity (gal/d)/ft T
30.5	0.63	40.0	0.36			
30.7	.50	41.0	.32			
31.0	2.21	45.7	.34			
31.0	1.65	44.2	.20			
33.5	1.47	53.6	.00	74.6	47.3	3,530
33.2	.63	53.5	.014	187	35.2	6,580
33.0	.12	47.0	.028	10	35.0	350
32.0	.12	50.0	.032	10	25.5	255
31.0	.06	45.3	.00	10	25.7	257
32.7	1.64	47.1	.00	29.3	25.0	732
31.1	7.02	47.4	.17			
31.0	2.58	42.4	.56			
31.1	1.47	41.0	.28			
31.0	1.76	48.6	.15			
31.0	1.65	50.0	.29			
31.0	1.65	48.9	.45			
31.7	1.39	46.0	.36			
31.8	.50	47.0	.38			
31.8	.42	46.0	.34			
31.9	.51	45.0	.40			
32.4	.50	45	.30			
33.0	.50	43.5	.26			
33.1	.50	40.3	.39			

Table 3.--Comparison of methods available to estimate low-flow characteristics in the "Driftless Area" of the Trempealeau-Black River basin

Type of site	Type of data	Number of sites with data	Time required to collect data	Analytical method to determine $Q_{7,10}$	Standard error of 10-year low flow ($SE_{7,10}$) (in percent)
Gaging station	10 years or more recorded stream-flow	5	18-56 years	Frequency analysis	6
Gaging station	10 years recorded streamflow	None[1]	10 years	Frequency analysis	11
Low-flow partial-record stations	7-25 base-flow discharge measurements	13	6-10 years	Correlation analysis	13
Miscellaneous sites	3 base-flow discharge measurements	27	1- 2 years	Correlation analysis	19
Miscellaneous sites with drainage areas less than 150 mi^2	1 base-flow discharge measurement	87	1 day	Regression analysis	17
Ungaged sites with drainage areas less than 150 mi^2	Basin characteristics	Unlimited	2 hours	Regression analysis	37

[1]Example was presented to illustrate the accuracy that could be obtained from 10 years of recorded streamflow in the basin. Data from existing gaging stations were adjusted to represent 10 years of recorded streamflow for the analysis.

Table 4.--Comparison of methods available to estimate low-flow characteristics in the glaciated area of the Trempealeau-Black River basin

Type of site	Type of data	Number of sites with data	Time required to collect data	Analytical method to determine $Q_{7,10}$	Standard error of 10-year low flow ($SE_{7,10}$) (in percent)
Gaging station	10 years or more recorded stream-flow	1	66 years	Frequency analysis	23
Gaging station	10 years recorded streamflow	None[1]	10 years	Frequency analysis	62
Low-flow partial-record stations	11-20 base-flow discharge measurements	5	7-11 years	Correlation analysis	37
Miscellaneous sites	3 base-flow discharge measurements	14	1- 2 years	Correlation analysis	68
Miscellaneous sites with drainage areas less than 150 mi^2	1 base-flow discharge measurement	30	1 day	Regression analysis	76
Ungaged sites with drainage areas less than 150 mi^2	Basin characteristics	Unlimited	2 hours	Regression analysis	105

[1]Example was presented to illustrate the accuracy that could be obtained from 10 years of recorded streamflow in the basin. Data from existing gaging stations were adjusted to represent 10 years of recorded streamflow for the analysis.

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